

# Analogical Modification in the Creation of Contemporary Art

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## Introduction

Human beings have a flexible ability to use knowledge in a new situation such as understanding a new concept. Analogical reasoning is one of the core components needed to explain such flexibility. In this paper, with case studies of artists' creation process, we propose a framework to study the role of such analogical reasoning in real-life creative settings in which flexibility is heavily required.

A majority of previous cognitive studies of analogy seems to have focused on the process of analogical reasoning mainly in the context of understanding and problem solving, paying attention only to similarity between a source and a target, without connecting this process with other activities. In this paper, we will reconsider those features in order to go beyond the scope of previous studies and show a new direction for analogy research.

First, our focus will be on the process of analogy in the context of creativity. It has been pointed out that the creative process, such as in artistic creation and scientific discovery, often involves analogical reasoning. For example, Holyoak and Thagard (1995) recount many anecdotes of analogy use in art and science; however, there have been few empirical studies on this issue. In this paper, we will describe how artists use analogy and related processes in their artistic creation.

Second, in order to study the process of analogy in such a creative situation, we need to pay attention not only to similarity between a source and a target but also to differences between them, because creation of new works requires generation of differences from the previous works. Thus, dominant models of analogy need to be extended to include the process of difference making. Adaptation

(Novick & Holyoak, 1991) has much to do with this process. Adaptation is the process by which we adjust the mapping process itself to meet constraints in a task. In this paper, we extend the concept of adaptation to include not only the process of adjustment under certain constraints, but also the process of active difference making, a process which, sometimes, even changes such constraints themselves. We call this kind of adaptation, in the context of creation, "analogical modification". It modifies major features of the source to create a new thing or event. Analogical modification is not a random generation of a new pattern because it maintains the general structure of analogical mapping. Analogical modification could be a strong candidate feature for models of analogy in the context of creativity.

Third, real settings being different from laboratory settings, analogy there does not occur in a vacuum. Analogy often occurs in connection with other cognitive activities. Thus, in this paper, we will describe the process of analogical modification in connection with artists' superordinate concepts and artistic visions for art making.

On one hand, an artistic vision is a long-term intention or a main theme of one's artistic creation. An artist forms it through many years (often more than ten years) of creative activities (Yokochi & Okada, in press). Such an artistic vision guides an artist's daily creative activities in a certain direction. Through years of accumulation of creative activities in a certain direction, s/he would be able to form her/his own artistic style. On the other hand, in daily creative activities, such as creation of an artwork, an artist uses various techniques to express her/his ideas in the form of art. S/he also uses various cognitive operations such as analogy and analogical modification to produce new art concepts or new techniques. Such daily creative activities

also affect the content of the artistic vision. By a new concept created through analogical modification, her/his artistic vision can be clarified and refined. Thus, an artist's activities, in different time spans, interact with each other in the dynamical process of art making. However, previous studies of artistic creation seem to have focused either only on the short-term process of making artworks or on the long-term process of artistic expertise. Shedding light on the process of interaction among activities in different time spans seems to help us to fully understand artistic creation in real-life settings.

In this study, we conducted case studies of two artists to capture such an interaction among activities with different time spans.

### Method

The subjects were contemporary artists who participated in our previous research on artistic vision (Yokochi & Okada, in press). Yokochi & Okada conducted retrospective interviews with thirteen artists. The total time of the interviews averaged about eight hours per person. All interviews were recorded with an IC recorder and a video camera. During the interviews, by showing the portfolio of her/his artwork, we asked each artist about time, method, and intention of creation of each artwork since s/he started her/his career as an artist. After such an interview, asking about each artwork, we also asked each artist whether or not there was a base or a core of her/his artistic creation and, if so, when it clarified in her/his mind, and when and how her/his creative activities changed since s/he started a career

as an artist. We also asked her/him questions about her/his daily activities for artistic creation, educational background, and other related topics. After transcribing the interviews, we picked the utterances related to art concepts and techniques, source of the art concepts, relationship between artwork series and artistic vision, and so on. Based on such data, we regarded the artist as having artistic vision if s/he was able to describe her/his intention, that underlies her/his creation of artworks, and if there were actually more than one artwork derived from that intention.

This study found that there were three stages in the process of artistic expertise. When the artists were young, they made artworks based on external criteria. Later on, they recognized the limitations of this approach, and started to focus on internal criteria. Finally, on average about thirteen years after beginning their artistic careers and creating several series of artworks, artists formed their own personal artistic vision.

Out of these thirteen subjects in that study, we picked two artists for further analyses, because we were able to conduct follow-up interviews for three more hours in the artists' studios and to collect rich data. We conducted case studies to describe their creation process in detail based on the interview data.

### Results and Discussion

Figure 1 shows the artist Shinji Ogawa's ten-year process of creation. The horizontal line indicates time and the top half of the figure shows different levels of activity (i.e., artistic vision, superordinate concepts, and artistic techniques).

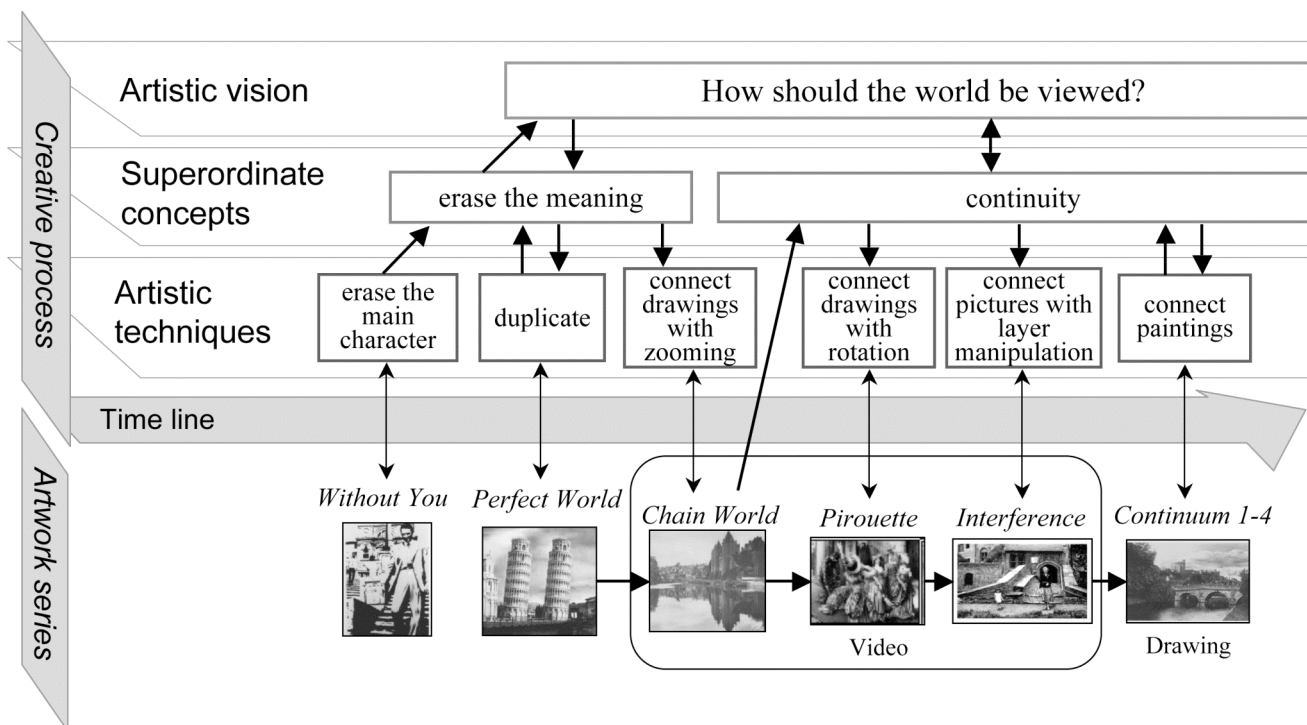


Figure 1 Creation process of Shinji Ogawa

superordinate concept is an abstract concept that has the common features of concrete examples (Hatamura, 2003). For example, a superordinate concept of a steering wheel and a brake of a car is a “control device for driving”. Using such a superordinate concept, we can search for a new type of control device for driving such as a micro-computer controller to automatically avoid a traffic accident. In the case of artistic creation, the artists often generated superordinate concepts for their art making.

Analogical modification serves as a cognitive operation to create a new artistic technique from one’s previous work. In our case studies, we found two types of analogical modifications. Figure 2 shows those two types of analogical modifications as well as ordinary analogy. The first type of analogy shown, the leftmost one, is the ordinary analogy. With this type of analogy, artists map a structure from a previous work to a new one. In such a case, neither a superordinate concept nor an artistic vision is necessarily activated in the artist’s mind. For example, Ogawa analogically mapped the artistic technique that he created in his previous artwork (i.e., erase the main character of a movie poster) to famous oil paintings and thus created new artwork. The analogy type shown in the middle of Figure 2 is an analogical modification with the same superordinate concept. In this case, an artist abstracts a superordinate concept from series of artworks, chooses a different value in that concept and creates a new art technique. For example, based on an artistic technique that he created with the artwork “Chain World” (the technique is to connect drawings with zooming in an object and zooming out), Ogawa created a new art work called “Pirouette” (the artistic technique for this series is to connect drawings with rotation) using a superordinate concept “continuity” and

searched a new value in that dimension. The rightmost type of analogy, in Figure 2, is an analogical modification with a new superordinate concept. In this case, an artist first applies an existing superordinate concept to create a new artwork. During this process, other superordinate concepts are also activated. Then, s/he chooses an appropriate superordinate concept that matches with her/his artistic vision. For example, Ogawa created “Chain World” in line with the superordinate concept “erase the meaning” and found that “continuity” was also a salient superordinate concept. He thought that “continuity” is more appropriate to show his artistic vision, “How should the world be viewed?” On one hand, thus, analogical modification with the same superordinate concept seems to contribute to productive creation of artworks along with her/his already established artistic style. On the other hand, analogical modification with a new superordinate concept seems to contribute to a leap in her/his creative activities by changing the direction of art making. And, both these operations go further than the ordinary type of analogy. These three types of operations were found in our case studies of two artists.

In terms of research methodology, this study adopted the retrospective interview. Retrospective interview has been thought to be less reliable than concurrent talk aloud method (Ericsson & Simon, 1984). However, to collect data on such a long-term process (more than ten years of creation process) is practically impossible with online methods such as observation or experiments. In combination with analyses of artists’ portfolios of artworks, and records of gallery shows, we tried to capture the process as accurately as possible. As Gentner, Brem, Ferguson, Markman, Levidow, Wolff, & Forbus (1997) did to describe the process of analogy use in Kepler’s discovery, with analysis of

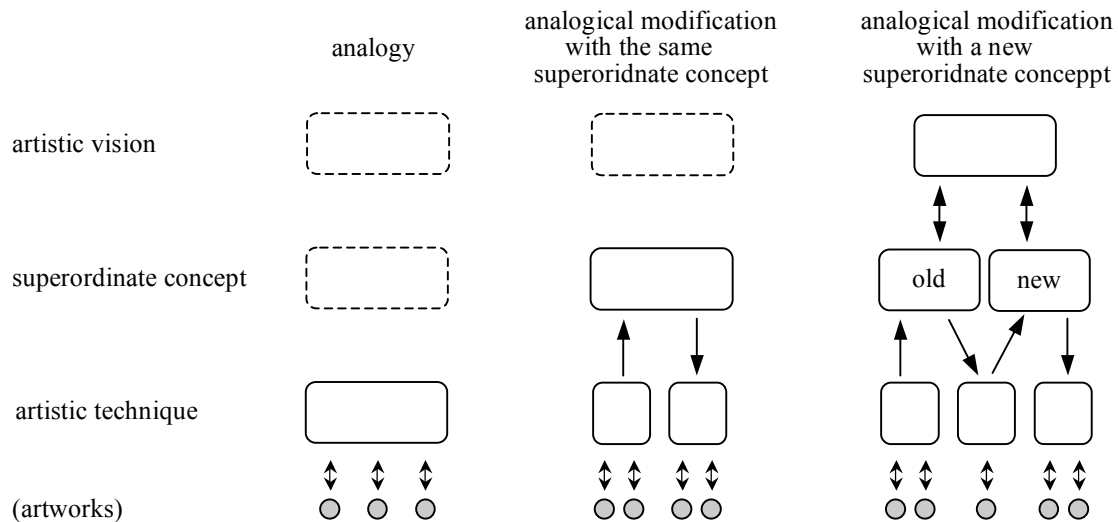


Figure 2 Analogy and analogical modifications

Note: Boxes with plain line indicate a cognitive operation that is actively influencing and boxes with dotted line indicate a process that is potentially influencing. Arrows indicate the direction of influence.

historical data, using ecologically valid field data can be regarded as a very informative way to capture not well-studied phenomena in real-life settings, like artistic creation.

### Conclusion

In conclusion, with detailed case analyses of artists' creation process, we showed the importance of extending the scope of analogy research to include the context of creativity, such as artistic creation, focusing on the process of difference making, and connecting it with other human activities. We discovered that two types of analogical modification in addition to ordinary analogical mapping are used in the artistic creation process. Interaction among activities in different time spans, such as analogical modification and artistic vision, was a key to understanding the artistic creation process in real settings.

As we described earlier, analogical reasoning is one of the core components needed to explain human's flexible ability to use knowledge in a new situation. The creation process is one of the most salient processes in which such flexible use of knowledge is heavily required. Therefore, studying analogical reasoning in artistic creation brings us useful insights for understanding such flexibility. Without explaining the analogical reasoning process in the context of creativity, models of analogy seem to have limited implications. Our research suggests that analogical

modification is an important component for a more comprehensive model of analogical reasoning in addition to previously uncovered processes of analogical mapping and adaptation.

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