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The process of art-making:
An analysis of artist's modification of conditions in the art-making process

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Abstract

The present study investigated how younger and expert artists create artwork, paying special attention to the modification of conditions in the art-making process. Here, "process modification" is the means by which artists generate new artistic ideas/concepts by modifying elements of one's own previous artwork. To examine whether younger artists use such modifications in the same manner as experts, we interviewed 28 contemporary artists (including 14 experts). Results revealed that most of the younger artists modified their work unsystematically. Younger artists drastically changed the subject/motif, method, and concept for their new artwork. Experts, in contrast, actively used process modification to create a new technique and generated a new concept based on their creative vision.

Keywords: artistic creation; creative process; art-making process; process modification

Introduction

How do people create artwork and become experts in this domain? Are there differences in the cognitive processes underlying artistic creation between younger artists and experts? The present study investigated potential experienced-related differences in artistic creation by analyzing retrospective interviews with artists during the early and progressive stage of an artistic creation.

Artistic Creation as Problem-Solving

Artistic creation can be regarded as a creative problem-solving process (Simon, 1973). In such a process, people search for goals, tools, and ways to make art in ill-defined problem space(s). To do so, they need to explore new frames in a problem space or generate a new problem space itself (i.e., problem finding). In such cases, it is difficult to use algorism or well-known heuristics, because goals and methods are not known in advance. Therefore, exploration becomes an essential process in such an endeavor. This study tries to describe the detailed process of such explorations adopted by artists during their long-term artistic activities.

Cognitive Process of Art-Making

Several studies have been conducted on human creativity, especially within the artistic realm (e.g., Getzels & Csikszentmihalyi, 1976; Mace & Ward, 2002; Okada,

Yokochi, Ishibashi, & Ueda, 2009; Patrick, 1937; Stokes, 2014). For instance, Getzels and Csikszentmihalyi (1976) and Mace and Ward (2002) emphasized the importance of the "problem-finding process" within artistic creativity. In particular, Getzels and Csikszentmihalyi (1976) studied art majors' constructions of still life drawings. Their results indicated that students whose drawings were evaluated as highly creative were more exploratory in their work both before and during their drawings (i.e., arranging still life objects or changing tools more frequently). The authors also observed that after graduating from art school, the students who participated more in problem-finding activities were more successful in their careers. Thus, problem-finding could be a key activity for quality artistic creation.

Mace and Ward (2002) conducted interviews with artists to identify how they generated ideas during creation process. The authors developed a process model of art-making with the following four steps: "Artwork conception," "Idea development," "Making artwork and idea development," and "Finishing the artwork." While the process model is helpful, Mace and Ward could only describe these four steps; they did not assess potential underlying mechanism for progressing through these steps.

Through the using of art historical biographies, Stokes (2014) analyzed the process of artistic creation as problem-solving activity, revealing that paired constraints play an important role. Constraints have been regarded as having the function of both promotion and inhibition (e.g., Simon, 1973). Applying this idea to the artistic creation process, Stokes argued that precluding a constraint on the creative process (e.g., realism) helps promote another aspect of the paired constraint (e.g., abstraction). Using this framework to describe the creation process of famous artists such as Mondrian, Klee, Monet, and Chuck Close, Stokes suggested that the creative process proceeds as a cascading cycle until a new artwork is created.

Recently, Okada and colleagues have conducted research on the medium-term or long-term creative process of art-making, including the process of making a series of artwork based on certain artistic styles or themes/concepts (Okada, Yokochi, Ishibashi, & Ueda, 2009; Takagi, Okada, & Yokochi, 2013, Takagi, Kawase, Yokochi, & Okada, 2015; Yokochi & Okada, 2006, 2007). Of specific focus is how an artistic theme/concept is formed in an artist's mind or how

sub-themes/sub-concepts are derived from the main theme/concept from a cognitive psychological perspective (Okada, Yokochi, Ishibashi, & Ueda, 2009; Yokochi & Okada, 2006, 2007).

Yokochi & Okada (2007) revealed that artists develop expertise through several phases over the years. For instance, artists often construct a main theme, "creative vision," after about 12 years of practice post-art school. Creative vision is a somewhat abstract theme/concept, such as "life and death," "viewing/seeing," and "relationship with others," and is formed through long-term practice. The authors claimed that creative vision guides the construction of an artwork series in a certain direction, giving the artwork the consistency as a common base. Based on this creative vision, an artist finds suitable motifs/subjects and generates new artistic methods and creative ideas.

Okada et al. (2009) investigated the creation process of art concepts focusing on "analogical modification," which refers to cognitive processes tasked with generating new artistic ideas/concepts by analogically modifying elements of the artists' previous artwork. The authors claimed that 1) patterns of art concept formation gradually change as artists accumulate experiences; 2) artists use their creative vision for analogical modification of their art-making process; and 3) analogical modification enables artists to generate various artwork series, which are mutually connected with each other under the same creative vision. Takagi et al. (2013) also discovered, through ten months of qualitative and quantitative analyses of interviews with an artist, that the artist generated a new art concept for a new series. Here, the artist modified his creative process in multiple ways, including the modification of perception and action. We refer to these modifications in art-making process, including analogical modification and modification of perception and action, as "process modification" throughout this paper.

For the present study, we investigated how artists form their goals, art concepts, and creative vision, as well as how they develop methods for creating artwork series, paying special attention to "process modification." In terms of the development of artistic creative expertise, a creative vision, which is formed through many years of creative activity and consists of long-term intentions or goals for creation, serves as a framework to guide the process of creation (Yokochi & Okada, 2007). Because of such a creative vision, experts' creative process would be substantially different from young ones. Therefore, we also examined similarities and differences between younger and expert artists in terms of this concept formation process.

Methods

Participants: We interviewed 28 Japanese contemporary artists, comprising 14 younger artists, "YNG" (including 7 art major graduate students; 7 women, age range = 20-30 years, mean age = 28.3 years, mean work experience = 8.64 years, SD = 4.19), and 14 expert artists, "EXP" (4 women, age range = 40-60 years, mean age = 44.9 years, mean work experience = 23.14 years, SD = 7.84). These artists have

created various art forms, including paintings, sculptures, installations, photographs, and so on. All artists have participated in solo or group exhibitions every year, especially the expert artists, who have exhibited their work worldwide (including the USA and Europe). Those who participated were recommended by their peers, and in the case of the graduate students, they were nominated by their advisers.

Procedure (Portfolio-interview): The present study was conducted from 2005 to 2018. Because each artist's whole body of work was large in size, we interviewed each artist individually several times, using a portfolio of his/her entire work, which we referred to as a "portfolio-interview." The average interview time was 8 hours for YNG and 10 hours for EXP. This difference in interview time was because experts had a longer career and created more artwork than did younger artists. The portfolio-interview was conducted in a quiet room, which was either an art studio, home, or our university office. All conversations were recorded with IC recorder and a video camera.

The portfolio-interview was conducted as follows; First, we asked artists to explain each of their artwork pieces (e.g., "when and how was the artworks made?" "What kind of materials was used?" and "What was the idea/concept for the artwork?"). Second, we asked artists to identify what aspects of their work were kept and which were changed from prior work (e.g., "What (element) was changed from previous work?" and "What was a new or additional idea of this artwork?"). Finally, after explaining all of their work by reflecting on their entire career, the artists were asked whether they had their main art concept/theme (i.e., creative vision); if so, they were asked to report when they had realized this vision (e.g., "What is your main art concept/theme?" "When did you recognize the theme?" and "When were the turning points in your own art career?"). Additionally, we conducted semi-structured interviews as follows to gather information on: 1) originality in making and evaluating artwork (e.g., "What do you think about originality in your artwork?" and "Do you think it is important to represent originality in your work?"), 2) general process of making art (e.g., "How long do you usually spend on making/thinking about your work each day?" and "When and how do new ideas come up?"), and 3) educational background and biography of the artists.

Analysis procedure (Analysis of the process modification type and developmental trajectory of creation):
We analyzed the words used by the artists during the portfolio-interview and the features of their artwork. The coding framework was both theory and data driven. The categories for process modification included the categories for analogical modification (Okada, et al., 2009), and were guided by related theories regarding creativity and education/expertise, such as exploration (Boden, 2004), and reflection (Schön, 1983; Zimmerman, 2006). Further, the categories were inductively derived from the transcripts of the portfolio interview data, using the KJ method, which consists of a set of systematic procedures that seek to derive

a common (affinity) feature of data and ideas (Kawakita, 1967).

First, we specified the "main art concept and related sub art concept," "method and related methodology," and "motif (subject)" of each of artwork, and identified how each was changed from previous artwork. Second, we refined the categories for analogical modification (Okada et al., 2009) reflected in the interview data and features of works. Finally, the categories for process modification included and defined eight codes reflected in the interview data (see Table 1).

The interview data and all photographs of artwork were organized and stored using the computer package, MAXQDA, which is designed to organize unstructured data in qualitative and quantitative analyses. We developed the categories of process modification, and coded the portfolio interview data with the help of MAXQDA.

Results and Discussion

Following analyses based on the process modification categories, we examined distinctions between YNG and EXP artists, particularly comparing *before* finding a creative vision, "EXP_before," and *after* finding a creative vision,

"EXP_after." Besides, we assessed how the artists generated new art concepts and series after realizing their creative vision.

Group comparisons in process modification types

Table 2 shows the number of artists who used each type of process modification, and the mean number of times YNG and EXP used each type (before and after realizing their creative vision), and artists who had their creative vision, "AwCV" (before and after realizing their creative vision), respectively.

Table 2 shows that there is little difference between the number of types between YNG and EXP_before groups in terms of "Subject modification" (YNG 79% vs. EXP_before 93%), "Structure modification" (29% vs. 36%), and "Concept modification" (14% vs. 0%). Although there is a subtle difference in "Unsystematic change" (57% vs. 64%), which refers to changing the art subject/motif, methods, and concepts from prior work, YNG tended to use "Searching for suitable subjects and methods" (86% vs. 50%) and "Subject modification with reconsideration of artistic methods" (73% vs. 43%) more often than the EXP_before

Table 1. Types of process modifications and definitions

Reference Frame for Modification	Modification Type	Definition
None	Type 0 No modification	Reproducing a previous work
Idea	Type 1_1 Unsystematic change	Changing both a previous motif, method, and concept without any specific goal (or sub-goal) e.g., changing all based on a temporal (casual) idea
	Type 1_2 Searching for suitable subjects and methods based on prior artistic ideas	Changing both motifs/subjects and methods to make artwork more suitable for the prior idea e.g., searching motifs and methods based on the idea for prior work
Methodology	Type 2_1 Quantitative modification	Changing size or material of previous work without changing subjects and concepts (becoming bigger/smaller size than previous work) e.g., changing the size of Mobiles
	Type 2_2 Subject modification	Changing motifs/subjects to make a new artwork by using the same methodology as for prior artwork e.g., applying Mobiles to various motifs
	Type 2_3 Subject modification with reconsideration of methods	Reconsidering the methodology while making new artwork by changing subjects and realizing availability/possibility of the methodology e.g., reconsidering availability of Mobiles methodology
Sub or Main art concept	Type 3 Structure modification	Generating a new methodology, in line with a sub art concept or a main art concept of artwork series e.g., generating "Mobiles" as a new methodology of sculpture
Creative vision	Type 4 Concept modification	Forming a main art concept and generating sub-concept (artwork series) according to a creative vision e.g., generating "Constellations" series based on Calder's main theme "Universe"

artists. Moreover, artists using "Subject modification" ended up in a stalemate/dead-end (21% vs. 43%).

Comparing the YNG and EXP_after conditions, although both used "Subject modification" (YNG 79% vs. EXP_after 100%), YNG tended to use more "Unsystematic change" (57% vs. 27%), "Searching for suitable subjects and methods" (86% vs. 8%). In contrast, EXP_after tended to use more "Structure modification" (29% vs. 73%) and "Concept modification" (14% vs. 82%). Furthermore, the number of EXP_after artists who experienced dead-end was reduced (21% vs. 9%).

A two-way factorial analysis of variance (mixed plan, factor 1: artists (3 levels, YNG, EXP_before, and EXP_after) $\times$ factor 2: types of process modification (8 levels)) was conducted on the number of times each artist group used the various process modification types. First, Mauchly's test of sphericity revealed a sphericity violation ($p < .01$); hence, a Greenhouse-Geisser correction was used to adjust the p-values and degrees of freedom for interaction and main effects; p-values for simple main effects and multiple comparisons were determined based on Benjamini and Hochberg (1995).

The results revealed a significant interaction, $F (6.48, 116.61) = 2.868, p = .0372, \eta^2 = .121$, and a significant simple main effect of factor 1 at "Searching for suitable subjects and methods" and "Concept modification" ($F (2, 36) = 6.384, p = .0169, \eta^2 = .262; F (2, 36) = 4.733, p = .0449, \eta^2 = .208$, respectively). YNG used more "Searching for suitable subjects and methods" than EXP_after ($p = .0032$); in contrast EXP_after used more "Concept modification" than YNG and EXP_before ($p = .0022, p = .0218$, respectively).

The results indicate that artists in their early careers changed their artwork unsystematically and searched for suitable subjects and methods based on their previous ideas/concepts. Unsystematic refers to taking "a big jump" in creation, whereby it is difficult to identify commonality between new and previous artwork. Seeking suitable subjects and methods, however, is a means by which artists make more suitable artwork while keeping a prior art idea/concept. In fact, after enacting unsystematic changes, 36% (YGN 18%) of the artists searched for suitable subjects and methods. This suggests that the artists generated sub goals within their art-making process to find appropriate methods and motifs after taking "a big leap" in their creative activity.

Comparison in process modification types within AwCV group

To examine differences among usage types before and after

Table 2. The number of artists using each type of process modification and the mean number of times each process was used

Process Modification Type	YNG (n=14)		EXP _before vision (n=14)		EXP _after vision (n=11)		AwCV_before vision (n=14)		AwCV_after vision (n=14)	
	No. of artists	Mean no. of times (SD)	No. of artists	Mean no. of times (SD)	No. of artists	Mean no. of times (SD)	No. of artists	Mean no. of times (SD)	No. of artists	Mean no. of times (SD)
Type 0 No modification	1	0.1 (0.27)	0	0.0 (0.00)	0	0.0 (0.00)	0	0.0 (0.00)	0	0.0 (0.00)
Type 1_1 Unsystematic change	8	1.1 (1.23)	9	1.9 (2.27)	3	0.5 (0.93)	8	1.6 (1.39)	3	0.4 (0.84)
Type 1_2 Searching for suitable subjects and methods	12	1.3 (0.83)	7	0.7 (0.83)	1	0.2 (0.60)	6	0.9 (0.95)	0	0.1 (0.53)
Type 2_1 Quantitative modification	1	0.2 (0.80)	2	1.4 (4.29)	2	0.5 (1.51)	1	1.1 (4.28)	2	0.4 (1.34)
Type 2_2 Subject modification	11	2.6 (3.13)	13	5.4 (3.98)	11	5.9 (3.24)	11	4.8 (3.96)	12	5.1 (3.37)
Type 2_3 Subject modification with reconsideration of methods	11	1.7 (1.82)	6	3.0 (5.82)	7	1.8 (2.23)	4	0.9 (2.37)	9	1.7 (2.02)
Type 3 Structure modification	4	0.5 (0.85)	5	0.6 (1.01)	8	3.5 (6.71)	2	0.4 (0.76)	6	2.9 (6.05)
Type 4 Concept modification	2	0.4 (1.34)	0	0.0 (0.00)	9	4.3 (6.90)	0	0.0 (0.00)	10	3.8 (6.22)
Dead end	3	0.2 (0.43)	6	0.5 (0.65)	1	0.1 (0.30)	2	0.4 (0.65)	0	0.1 (0.27)

finding a creative vision, we focused on AwCV (artists with creative vision) and compared the number of artists using each type of process modification from before to after realizing this vision (see Table 3). McNemar's test was used for the matrix. The results indicate that the number of artists using "Concept modification" increased significantly after finding a creative vision (Holm's adjusted p = .008).

Next, we summed the number of times artists used each type of process modification before and after finding their creative vision and then conducted a two-way factorial analysis of variance (within-subjects, factor 1: types of process modification (8 levels) × factor 2: before and after finding creative vision (2 levels)). Mauchly's test of sphericity revealed a sphericity violation (p < .01). Therefore, the Greenhouse-Geisser correction and Benjamini-Hochberg adjustment were employed.

The results indicated a significant interaction, F (2.06, 26.77) = 3.902, p = .0315, η^2 = .231, and a significant simple main effect of types of process modification before and after finding a creative vision (respectively, F (2.58, 33.61)= 7.036, p = .0014, η^2 = .351; F (1.67, 21.73)= 5.048, p = .0201, η^2 = .280). AwCV before finding a creative vision used more "Unsystematic change" and "Searching for suitable subjects and methods" than after finding a vision. Conversely, AwCV after finding a vision used more "Concept modification" than before (respectively, F (1, 13)= 6.421, p = .0249, η^2 = .331; F (1, 13)= 4.924, p = .0449, η^2 = .275; F (1, 13)= 5.192, p = .0402, η^2 = .285). Additionally, "Subject modification" was used more frequently than all of other types of process modification before realizing a creative vision (p < .05), and more frequently than "Quantitative modification," "Unsystematic change," "Searching for suitable subjects and methods," and "Subject modification with reconsideration of artistic methods" after realizing a creative vision (p < .05).

These results suggest that artists who have not yet found their creative vision tended to change their artwork unsystematic or search for suitable subjects and methods to produce satisfactory work. After finding a creative vision, the artists typically generate new ideas/concepts and are productive based on this vision. For example, Figure 1 shows the developmental trajectory of EXP_SG, who is one of our expert artists. He realized his creative vision on "How to See" eight years after beginning his career as a contemporary artist. During his first artwork series, called "Inside Outside," the size of artwork became increasingly large; thus the series reached a deadlock. Because of his creative vision, he was able to generate new art concept, called "Institute of Intimate Museums (IIM)", which aims to encourage viewers/visitors of his work to create their own private museums in spaghetti boxes. This "IIM" concept has helped him develop many series, referred to as "museums in …" (e.g., windowed envelopes, garments, and toy boxes). Additionally, he generated new related ideas, including "Director in museum," "Viewer in museum," and so on. Other artists showed a similar pattern of development. We calculated z-scores on the mean number of artwork series before and after finding a creative vision (before: 14.69 vs. after: 23.39). This result suggests that the number of series increased after artists found their creative vision.

General Discussion

Several features of younger artists and experts (or artists before and after finding a creative vision) can be reviewed in terms of art-making process, specifically in terms of how artists engaged in process modification.

Overall, the results suggest that younger artists and artists *before* finding a creative vision create successful work through the following processes:

1) Using the same process modification, such as "Subject modification," as experts.

2) Using different types of process modification from experts, including "Unsystematic change" and "Searching

Table 3. Number of artists (AwCV) using each type of process modification before and after finding a creative vision

Type 0 No modification		After vision Absence	After vision Presence	Type 2_3 Reconsider		After vision Absence	After vision Presence
Before vision	Absence	14	0	Before vision	Absence	5	4
	Presence	0	0		Presence	0	5
Type 1_1 Unsystematic		Absence	Presence	Type 3 Structure		Absence	Presence
Before vision	Absence	2	2	Before vision	Absence	5	5
	Presence	9	1		Presence	0	4
Type 1_2 Search		Absence	Presence	Type 4 Concept **		Absence	Presence
Before vision	Absence	5	1	Before vision	Absence	3	11
	Presence	8	0		Presence	0	0
Type 2_1 Quantitative		Absence	Presence	Dead end		Absence	Presence
Before vision	Absence	12	1	Before vision	Absence	8	5
	Presence	0	1		Presence	1	0
Type 2_2 Subject		Absence	Presence				
Before vision	Absence	1	1				
	Presence	0	12				

* p < .05, ** p < .01
n = 14, including 3 YNGs

for suitable subjects and methods."

Conversely, expert artists and artists *after* finding a creative vision create their work by:

3) Using "Concept modification" based on their creative vision.

4) Generating new art concepts and producing more artwork series than before finding a creative vision.

Half of the younger artists and artists in the early career stage tend to use Unsystematic change, which refers to changing the art subjects, methods, and concepts while creating artwork. As these artists are yet to clearly realize their superordinate concepts (or main theme/creative vision), they are unable to use Structure and Concept modification effectively. These younger artists, however, make new artwork while seeking suitable subjects and methods, which are based on concepts from prior work. This helps the younger artists form (or recognize) their own art-making theme.

After realizing a creative vision, artists create their work by implementing Structure and Concept modification. A creative vision, which is formed through many years of activity and consists of long-term intentions or goals for creation, plays a vital role in guiding the use of process modification. Thus, artists who have found their creative vision are able to work more productively and creatively.

Our results are consistent with the claim that artistic creation does not derive from "irrational and random thoughts/ideas" in creative writing (e.g., Oatley & Djikic, 2017), while several researchers claim that creativity depends on blind variation and random retention (e.g.,

Campbell, 1960). Creative writing studies indicate that writers continue to explore the same theme (or related themes) in their literary work (e.g., Patrick, 1937; Oatley & Djikic, 2017). Although previous studies described the exploration in the creation of poetry, literature, and fine art (e.g., Boden, 2010), they have not revealed how the exploration occurs or what kind of exploration contributes to longitudinal creative work.

Regarding these questions, using in-depth analysis of dancers' practice, Shimizu and Okada (2018) revealed that expert breakdancers engaged in "exploratory practice" to generate new and original skills. They claimed that "The dancers practiced with multiple goals, that is, not only to improve the quality of the skills but also to develop original and flexible skills that fit well into a performance by varying aspects of domain skills and by combining those domain skills with other domain skills" (Shimizu & Okada, 2018, p. 2392).

Artistic creation is also a process of exploring for a theme, concept, method, and motif to achieve one's goal as an artist. The present study reveals extensive explorations in artistic creation via process modification. A creative vision guides artists' creation and enables them to give consistency to their work. The formation of a creative vision seems to correlate with reconsiderations of the methods, subjects, and ideas for artwork series while reflecting on art-making processes and experiences. Thus, the process modification framework is useful when analyzing the details of the development of artwork series and creative expertise.
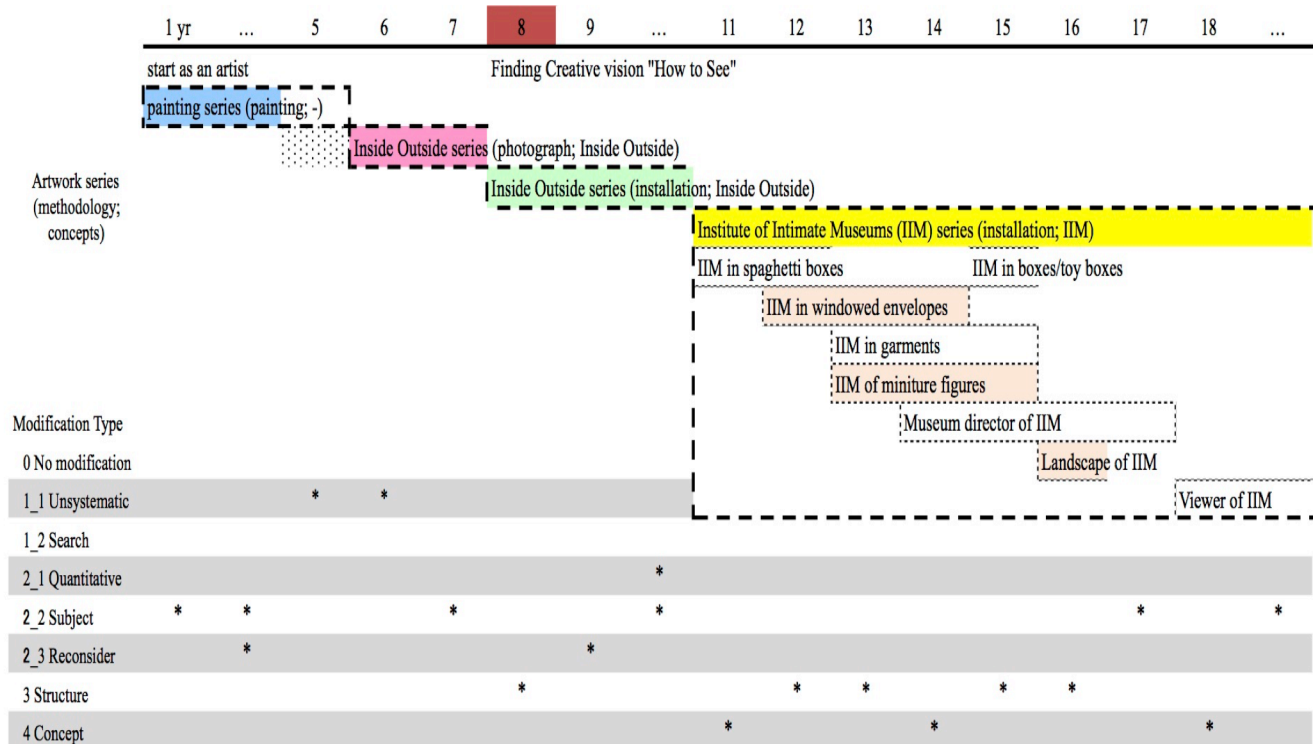

Figure 1. The developmental trajectory of artwork series created by EXP_SG

Acknowledgments

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