

# CONTENT-ORIENTED APPROACH TO KNOWLEDGE DESCRIPTION OF AESTHETIC EXPERIENCE

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## ABSTRACT

Aesthetic experience is regarded as a process that comprises a sequence of mental activities. We suggest a content-oriented description method for the modeling of aesthetic experience in order to illustrate what people appreciate and how. In this article, we focus on mental processes in which human beings appreciate artworks. Our description method illustrates the flows and contents of consciousness in aesthetic appreciation. The flows of consciousness are represented in a flowchart and contents of consciousness in a task flow. Our trial to build the description of appreciation revealed that mental processes in aesthetic experience are categorized into two types by direction of focus. When a human being focuses on an artwork, s/he gains a mental representation corresponding to physical irritations. When s/he focuses on him/herself, s/he experiences an emotion corresponding to mental representation. Moreover, we discuss the requirements in kansei externalization ontology, which provides systematic knowledge of kansei externalization, and the method of construction.

**Keywords:** aesthetic experience, content of consciousness, content-oriented, ontology, knowledge description

## 1. INTRODUCTION

Kansei is one of the essential factors in artistic activities. Because people produce artworks as a means of expressing their kansei, we can consider each sequence of behaviors in the production

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as *kansei externalization*. Besides the production of artworks, appreciation of artworks is also regarded as another form of kansei externalization. Thus, people are involved in artworks from two viewpoints. One is the viewpoint of creators who execute artworks, and the other is that of perceivers who appreciate artworks. From the creator viewpoint, kansei externalization is regarded to as the expression of impressions by creators in artworks. From the perceiver viewpoint, kansei externalization is regarded as the gaining of impressions from artworks. Our focus in the current study is on kansei externalization by perceivers. As long as people are involved in art works, kansei necessarily includes *aesthetic sensibility*. As mentioned above, receiving impressions entails externalization by perceivers, and expressing impressions is also a form of externalization by creators.

In general, if an artwork is highly admired by many people, we can find commonalities among perceivers' kansei externalization in relation to the work. However, we can also find individual differences in the perceivers' kansei externalization, because each perceiver is likely to have a variety of impressions of every single artwork. In kansei researches, one of important issues is understanding the commonalities and individualities in kansei externalization. Therefore, it is an important challenge for achieving a breakthrough in the issue is the organization of knowledge concerned with kansei externalization.

In this paper, we attempt to construct content-oriented knowledge descriptions for kansei externalization. The current study addresses *aesthetic experience* in the appreciation of artworks, which is an instance of kansei externalization. Our task in the study is to organize the flows and contents of consciousness in a perceivers aesthetic experience. We first construct knowledge descriptions for the contents of consciousness along with a flowchart expressing the conscious flows. We adopt *task flows* in ontological engineering as a content-oriented description method. Moreover, we discuss requirements in kansei externalization ontology, which provides systematic knowledge of kansei externalization, and the method of construction.

## 2. THEORETICAL BACKGROUND

### 2.1. Aesthetic Experience

Beauty, a word that is commonly used in everyday life, includes multiple concepts, such as grace, sublimity, and ridiculousness. In the field of aesthetics studies, these concepts are referred to as *aesthetic* which is etymologically related to *emotional*. Further, mental processes in which something aesthetic is generated are referred to as aesthetic experience [1]. In this context, it is notable that beauty is found in someone's consciousness. Thus, we should reconsider the manner in which human beingd experience beauty in artworks as a matter of consciousness.

We have argued that aesthetic experience can be described on *content space*, a model for the human mind proposed in a previous study [2]. The content space is a set of all possible contents of consciousness [3]. Baruss [4] precisely defined the consciousness as "all subjective awareness characterized by intentionality, and the explicit knowledge of one's situation, mental states or actions evidenced behaviorally." The content space includes aesthetic experience, because aesthetic

experience is a kind of awareness. Ijima [5] pointed out that aesthetic can be categorized based on the basis of the ways in which people are aware of their lives in aesthetic experience. In particular, he distinguished between grace and sublimity as follows. When a perceiver's appreciation of his/her own life is merely positive or direct, this experience is identified as grace. On the other hand, when s/he is overwhelmed by appreciation, s/he struggles for denial of his/her own life. After overcoming the struggle, s/he recognizes that his/her own life belongs to a higher dimension. This is identified as sublimity.

## 2.2. Emotional Experience

In this article, we adopt the definitions of feelings and emotions by Yamadori [6, 7]. He defined feelings as all possible mental processes except material representations, and emotions as processes including feelings, somatic changes along with feelings, changes in autonomic nerves, and all mental changes. Material representations are conscious as segments of representations, and are complex perceptive representations (e.g., thinking, concepts, linguistic representations, visual representations, auditory representations, somatic representations, motor representations, olfactory representations, and gustatory representations). Although feelings express emotions, mental content is not explicitly and necessarily conscious. Therefore, we cannot be conscious of feelings without any feedbacks from behaviors generated as the expression of emotions [6]. Feelings are not directly conscious, but are conscious with somatic sensory representations. Thus, there must be no distinctions between the consciousness of feelings and consciousness of somatic sense.

According to this insight, we recognize feelings with the basis of emotional reactions as physiological phenomena. Human beings instinctively have basic emotions: joy, sorrow, anger, fear, surprise, and hate. From the evolutionary perspective, these human emotions are extensions of those of other animals that we can actually observe. Therefore, we can regard emotions as physiological characteristics that have been genetically acquired. To understand human emotions, it is a critical fact that we experience emotions through consciousness of somatic sense.

## 2.3. Content-oriented Knowledge Description

Building ontology is one of the major approaches for describing knowledge systematically. From the knowledge-based viewpoint, "ontology is defined as a theory (system) of concepts/vocabulary used as building blocks of an information processing system [8]." Ontologies are classified into two types according to the nature of the knowledge described [9]. One of them is called *domain ontology*, which describes domain knowledge, and the other is called *task ontology*, which describes knowledge about processes. An example of building a task ontology is a study by Ishikawa and his colleagues [10]; the task in question was the proper functioning of petroleum refinery plants. The purpose of the study is to extract practical knowledge from the operating manual of the plants. Another example is the studies by Sasajima et al. [11, 12], which dealt with the construction of model of mobile phone users. This model described the behaviors of mobile phone users based on their tasks in the use of mobile services, and the ways in which they achieve the tasks. A *method of achievement* is a conceptualization of a sequence of partial functions that achieve a macro-level function, and a *way of achievement* is a conceptualization of the reason that a function is achieved by the method [13].

### 3. METHOD

Since aesthetic experience is regarded as a sequence of mental processes, as we have discussed, the mental processes have anteroposterior relations. That is a pivotal point for the description of kansei externalization. The point in question is the flow aspect of consciousness. Since we can follow the contents of consciousness in sequential order, we can describe them as the flow of consciousness. Sensory input and emotions associated with the input may trigger memory recall. An example of such memory recall is an episode involving the leading character in *La Recherche du Temps Perdu* by Marcel Proust. In the story, when he eats a piece of madeleine dipped in tea, he experiences vivid sensations and emotions just before recalling a memory from his childhood. Such experiences of memory recall can occur in everyday life. It often happens that we experience an emotion triggered by memories, such as a bad memory evoking bad feelings. Such experiences, known as *Proustian phenomena*, have been studied in psychology. Here, we have two important questions: Which of the anteroposterior relations is the primary one and what does it evoke in the mental processes? The former question is closely related to the flows of consciousness, and the latter to the contents of consciousness.

In Section 4, we introduce a knowledge description that actually illustrates one's flows and contents of consciousness in aesthetic appreciation. We first describe the flows of consciousness as a flowchart. The contents of consciousness are then described as a task flow. We describe perceivers' tasks and ways of achieving tasks, by adapting the consumers' behavior model developed by Sasajima [11, 12]. We regard and present perceiver's mental processes as tasks to achieve in Sasajima's model. Because aesthetics studies classify the ways of being aware of life into aesthetic categories, we also explain ways of achieving awareness of life through the experience of grace and sublimity, two instances of the aesthetic categories.

## 4. DESCRIPTION OF AESTHETIC EXPERIENCE

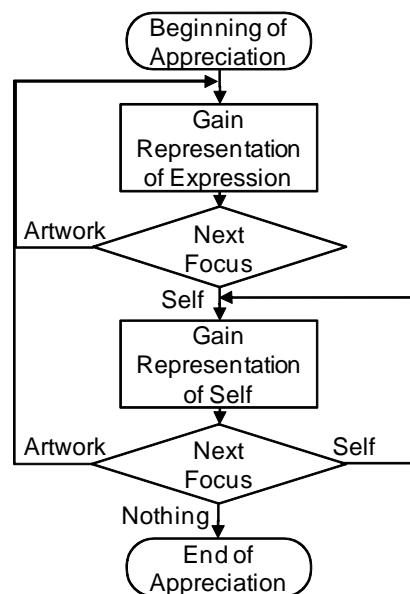
### 4.1. Flowchart of Appreciation

Ijima [14] described flows of consciousness in the appreciation of calligraphic works as follows: "A calligrapher draws characters which comprise some strokes and have one or more meanings, controlling speed and pressure with exquisite brush strokes. Just like him, a perceiver feels like s/he is entering the work. The appreciation of calligraphic works then occurs." As this passage indicates, a perceiver is made aware of his/her life by understanding the representation of life in an artwork. Furthermore, it reveals the flow aspect of this mental process, because the perceiver focuses on him/herself after being made aware of the expression of the artwork. Therefore, we can model the flow of consciousness as follows: A perceiver gains a special sensory representation (e.g., visual sensation or auditory sensation) by focusing on the expression of the artwork, and he then gains a somatic sensory representation by focusing on him/herself.

Figure 1 shows a flowchart of consciousness in appreciation. Branch conditions in the flowchart indicate what is to be focused on next. Focusing on an artwork allows a perceiver to proceed to the next step in order to gain a special sensory representation. Otherwise, focusing on him/herself allows a perceiver to proceed to the next step in order to gain a somatic sensory representation.

Thus, the branch condition corresponds to the switching of focuses and leads to the progression of steps. This processing is repeated until the end of appreciation. That is because someone who appreciates an artwork constantly switches focuses. The concept of time course is also a part of this appreciation of artworks. Therefore, the processing continues until the awareness is lost. In case of appreciation with a prolonged duration, such as listening to musical works, the same step may be continued.

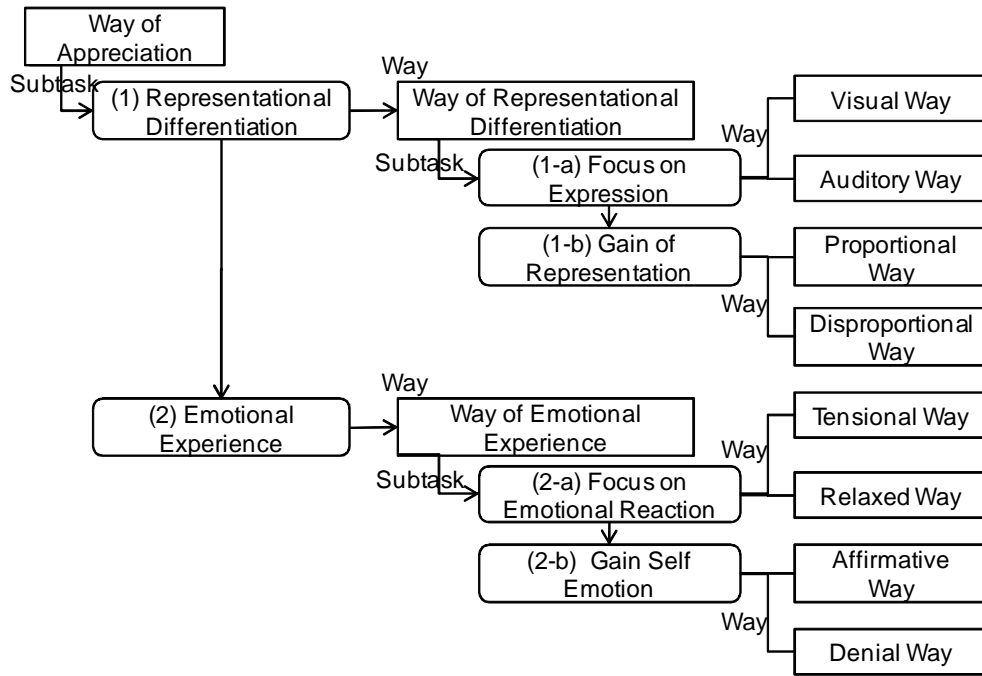
As previously noted, because emotional feedback makes an experience emotive, the gain of a somatic sensory representation by the perceiver focusing on him/herself is essentially identical to the emotional experience. The representation is also regarded as the awareness of the fact that a perceiver lives in front of a object to be appreciated. In the next section, we describe the contents of consciousness based on the assumption that the processing in the flowchart is a task of appreciation.



**Figure 1:** Flowchart of consciousness in appreciation

#### 4.2. Task flow of Appreciation

We have already argued that the processes in the appreciation of an object can be categorized into two types on the basis of their focuses. One of the types is processes where expressions of an artwork are focused, and the other is those where a perceiver him/herself is focused. The former is regarded as a task of representational differentiation, and the latter is regarded as a task of emotional experience. Figure 2 shows tasks of appreciation and ways to achieve them. As the figure indicates, (1) *representational differentiation* is a subtask of *way of appreciation*, and appreciation is completed when a successive subtask *emotional experience* is achieved. According to Kitamura and Mizoguchi, this series of subtasks is referred to as a method to achieve the task, and each subtask is combined with others by an AND relation. On the other hand, *visual way* and *auditory way* are ways to achieve the task of (1-a) *focus on expression*. The task is achieved by either the visual or auditory way. Therefore, this series is called a way to achieve and each way is combined by an OR relation.



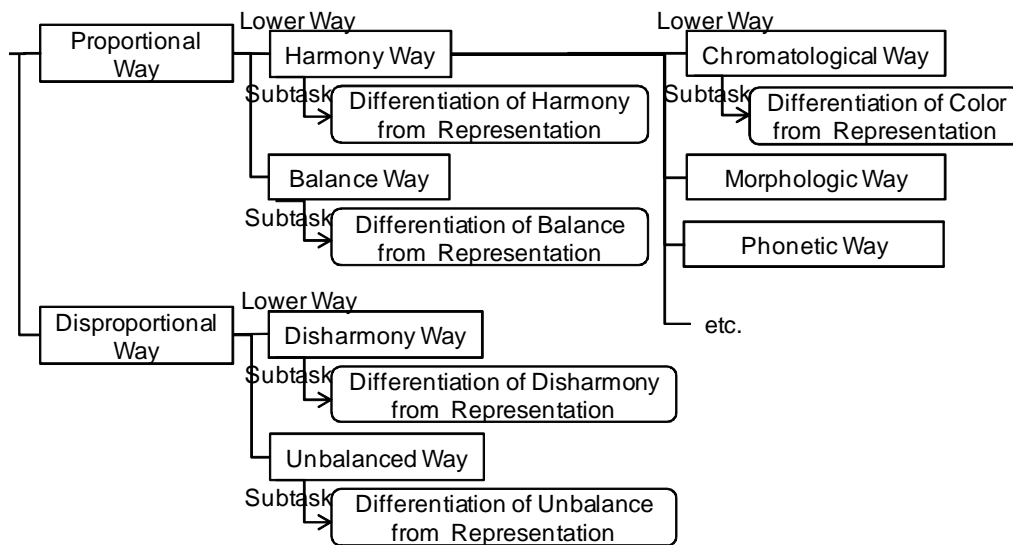
**Figure 2:** Example of knowledge description for appreciation task

We explain the details of task and way in Figure 2. First, to achieve task 1, a perceiver needs to look at the expression of an artwork and gains a mental representation of it. In subtask 1-a, the perceiver focuses on the expression of the artwork in a suitable way. For example, s/he focuses on drawings in a visual way, and music in an auditory way. In subtask 1-b, the perceiver gains mental representation through differentiation of the expression. The differentiation of mental representations such as proportion, harmony, unity, and beat from the expression of an artwork by the perceiver is a conscious operation. For example, harmony is differentiated from colors, symmetrical shapes, and keeping time to speak in rhyme in one breath. In contrast, finding disharmony between colors or asymmetrical shapes is also a conscious operation. Therefore, we refer to the former as a proportional way, and the latter as a disproportional way. Second, the perceiver experiences a particular emotion in task 2. To achieve this task, the perceiver needs to focus on an emotional reaction, and gains mental representation of his/her life. Thus, the perceiver focuses on his/her emotional reaction in subtask 2-a. Focus on emotional reaction as a feedback from somatic sensory representation makes the experience emotional. We can identify ways of somatic sensory representation as tension and relaxation. The tension and relaxation do not correspond to the status of the autonomic nerve system, but they are related to the system status. In subtask 2-b, the perceiver experiences a particular emotion after gaining self-representation by sensory representation. As noted above, somatic sensory representation by focusing on him/herself is regarded as emotional experience.

As explained above, aesthetic categories are identified by ways of achieving appreciation. In the next section, we explain how common aesthetic categories are achieved.

### 4.3. Ways of Aesthetic Experience

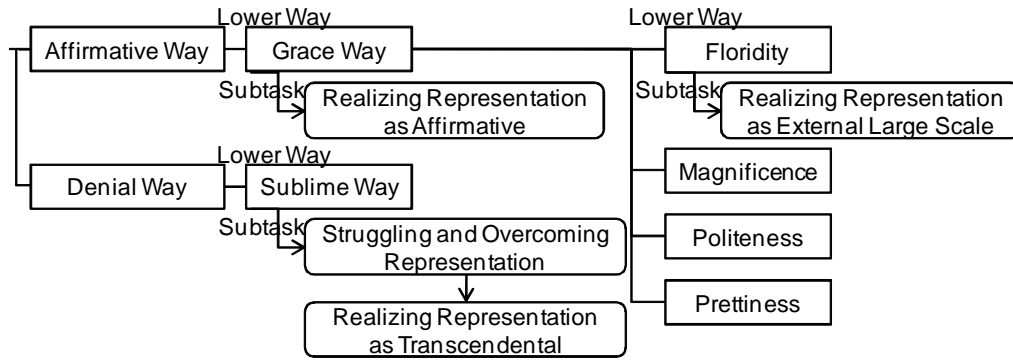
Aesthetic categories are distinguished by ways of being aware of the self as alive, and can be described as a set of *representation of expression* and *representation of self*. Grace, one of the aesthetic categories, generally refers to beauty. A good example of grace that we can experience in a visual way is the beauty of blossoms in full bloom. A mental representation of balance or harmony makes us experience grace. In Figure 3, this is described as the proportional way. As noted above, grace is a way that allows a perceiver to recognize his/her own life only positively or directly. Positively or directly means *with no mental conflict*; hence, a perceiver who recognizes grace necessarily experiences a positive emotion. In Figure 4, that is described as grace way.



**Figure 3:** Example of knowledge description about the proportional and disproportional way

We can also describe other aesthetic categories such as floridity, magnificence, politeness, and prettiness below grace. According to Ijima, floridity is realized in an external large scale, and magnificence is realized in an internal large scale. Moreover, politeness is realized in an external small scale, and prettiness is realized in an internal small scale. For example, a colorful carpet of flowers evokes floridity; a sea of clouds viewed from the top of a mountain evokes magnificence; a purplish flower of paulownia evokes politeness; and a single-stem flower in a glass evokes prettiness. These categories are described by specializing the grace way, and distinguished from others through the relationship between objects and a perceiver.

Sublimity is a way in which a perceiver recognizes his/her own life triggered by the negative mental representation in the expression of an artwork. In Figure 3, that negative representation is described as disproportional way. In Figure 4, the representation of self is described as sublime way under the denial way. Only a negative representation evokes negative emotions such as fears. Sublimity is a higher dimension than just a negative emotion; hence, this way contains the subtask *struggling and overcoming representation*.



**Figure 4:** Example of knowledge description about the grace and sublime way

## 5. DISCUSSION

### 5.1. Commonalities and Individualities in Kansei Externalization

We have already argued that appreciation comprises two tasks: representational differentiation (1 in Figure 2) and emotional experience (2 in Figure 2). The task of representational differentiation is a type of process where a perceiver gains mental representation (e.g., balance, harmony) from the expression of an artwork. On the other hand, the perceiver experiences an emotion, which is a physiological phenomenon, by focusing on an emotional reaction in the emotional experience. It should be emphasized that these tasks are distinguished by what the perceiver focuses on. It is extremely difficult to precisely find out the relationships between physical irritations and beauty experienced through the perception of the irritations. In other words, beauty does not merely and directly result from perceiving physical irritations. However, we can take particular note of individual representational images, because we have argued that beauty corresponds to physical irritations with the mediation of representational images in various ways. Hence, we examine the elaboration of aesthetic experience generalizing it as an example of kansei externalization. We discuss commonalities and individualities in kansei externalization under the following topics: (a) relation between physical irritations and representational images, and (b) relation between representational images and emotion.

**Relation between physical irritations and representational images** The relation between physical irritations and representational images is influenced by personal or cultural backgrounds. People who live in a preliterate culture cannot distinguish three-dimensional objects from two-dimensional objects in drawings, so the style of perception has been influenced by their background, for instance, education [15]. In the appreciation of an artwork, if a perceiver finds something to be the same as what its creator expressed, the perceiver and creator share the same contents in their consciousness. For example, people who do not know the perspective of a conventional technique may not understand distances indicated in drawings. Consequently, such people do not share the contents of consciousness with people who live in a different culture. In general, people who have almost the same cultural background may not share exactly the same contents of consciousness, although they may share similar ones. Therefore, commonalities and individualities are explained as the sharing of the contents of consciousness.



**Relation between representational images and emotion** The relation between representational images and emotion is accounted by an innate function, because emotional reactions are regarded as a physiological phenomenon. We have an innate fear of snakes [16]. We are likely to have a particular representational image against snakes as well as snake-like objects, such as a rope. Such an image evokes emotional reactions and has adoptive values from an evolutionary perspective [17]. Therefore, we can regard commonalities in a representational image and emotion as an innate function of human beings. For a further understanding of this point, an evolutionary perspective that argues for adaptive values is useful. In particular, we have a question regarding why the emotional experience that is regarded as an awareness of living life has been acquired in human evolution.

## **5.2. Ontology of Kansei Externalization**

We have described only rough-grained knowledge on aesthetic experience. However, it is sufficient to start of building a kansei externalization ontology. The task flow illustrated in Figures 2, 3, and 4 revealed notable facts on kansei externalization: aesthetic experience comprises of two types of processes. Therefore, we can sophisticate the kansei externalization ontology.

The task flow does not correspond to actual flows of consciousness, but only plays a role in the classification of concepts related to the consciousness. Therefore, we regard the actual flow of consciousness as an instance model for the classified concepts. Describing instance models is an important task. In concrete terms, we have to experimentally study the relation between (a) physical irritations and representational images, and (b) representational images and emotion. It may reveal what mental representation perceivers gain from expressions in artworks. The key of this experimental study is the externalization of kansei. We can access the contents of consciousness through experimental study if the perceivers express them. Therefore, we need to design experimental methods that encourage perceivers to externalize what they feel in appreciation. Then, we can derive the contents of consciousness to be described in the ontology.

## **6. CONCLUSION**

When a perceiver appreciates an artwork, s/he generally does not know how s/he experiences emotion, but what s/he experiences. We can approach an understanding of aesthetic experience only after illustrating the processes that experience contains and how it is processed. In this paper, we described content-oriented knowledge in appreciation as a flowchart and a task flow. The flowchart indicates what a perceiver focuses on, and the task flow indicates methods to appreciate and ways to achieve appreciation. On the basis of the description method, we discussed ways of being aware of life as self-awareness, and two aesthetic categories, grace and sublimity. According to the discussion, we can conclude that mental representation corresponds to physical irritations and emotion corresponds to mental representation. In future works, we concretize the kansei externalization ontology based on the flowchart and the task flow. The ontology is derived from experimental studies in order to access the contents of consciousness in appreciation. Further researches on the ontology would clarify the essences of aesthetic experience.

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