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ON THE SHAPES OF OBJECTS AND METAPHORICAL MEANINGS *

1 INTRODUCTION

Lakoff and Johnson (1980) and Grady (1999) discuss metaphorical expressions and focus on conventional expressions that describe abstract concepts such as life and love. Lakoff and Turner (1989) and Fauconnier and Turner (2002) examine how similarities between various concepts are grasped in creative expressions. Lakoff (1987, 1990) analyzes the metaphorical semantic extension of polysemous words in relation to image schemas. Yet metaphorical expressions like the examples presented in (1)-(2) involve similar configurations of objects but have not been analyzed from the perspectives of mapping and creativity:

- (1) a. Sister Martha's hair shows under the drift of her veil, it's a dark cloud of seaweed around her pale and drowning face. [BNC]
- b. #A black muffler was left on the floor. It was a dark cloud of *seaweed*.
- c. # There was a dirty mop in the shed. It was a dark cloud of *seaweed*.
- (2) a. (The description of a railway line)
 There are many unexplained events on the Keighley and Worth Valley line that runs from Keighley to Oxenhope five miles further up the *branch*. [BNC]
- b. First, it must be positioned so that it can be connected easily to the existing stopcock and to the *branch* which feeds the drinking water tap in the kitchen. [BNC]
- c. Within 2.5km (1½ miles) the road forks and the right-hand *branch* dips across a hollow towards Schwendi. [BNC]

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In (1), the metaphorical use of *seaweed* is possible only in the description of the shape of a woman's hair. Its metaphorical use evokes its ugliness, darkness, and curliness. As it is not the mere depiction of the shape, varied interpretation is possible in this way. In (2), on the other hand, the metaphorical use of *branch* is possible in describing the shape of more varied objects. Since all of these objects share the same shape, its metaphorical use is possible in the description of binary branching. From these expressions given in (2), the reader cannot understand whether their shape is beautiful or not, and less varied interpretation is achieved. Moreover, as this word can be used in the description of a variety of objects, it is unlikely that a complex interpretational process is involved depending on specific contexts. If we compare these two types of expression, the metaphorical expression given in (1) is more creative. This is because its use is restricted to the description of a more particularized shape of an object. In this paper, we will compare various metaphorical expressions that display different degrees of creativity. Specifically, we will see how various kinds of configurational information about objects affect the degree of creativity in these expressions.

2 PREVIOUS ANALYSES

2.1 Relevance Theoretic Account of Metaphorical Expressions

According to Sperber and Wilson (1986/95), the interpretation of conventional metaphorical expressions involves stereotypical knowledge about objects as in (3a). In other words, limited information about an object contributes to the interpretation. Since a pigsty is filthy and untidy, it is understood that the room is also filthy and untidy. On the other hand, in order to interpret a creative expression, more varied information is employed. Take (3b) for example, where the readers have different knowledge levels about Leconte de Lisle. By using this knowledge, it is understood that Leconte de Lisle's writing lacks contrasts. Since other interpretations are possible, it is also understood that there is something weak about his poetry. When the reader interprets this expression, it is unclear what information he or she will draw on in order to reach an interpretation. For this reason, the interpretation is unclear and more processing effort is required to interpret this expression. However, varied interpretations bring about poetic effects:

(3) a. This room is a pigsty. (Sperber and Wilson 1986/95: 236)
 b. His ink is pale. (ibid.: 237)

When we analyze (1)-(2), their interpretation involves the same factor, i.e., the appearance of objects. However, it is unclear why only the interpretation of (2) leads to a conventional interpretation. As for the use of *branch*, its interpretation involves

less processing effort, for more limited information is derived. However, it is uncertain how its conventional interpretation is related to the configurational information about the branch of a tree. Furthermore, if we suppose that the conventional metaphorical meanings are interpreted by deduction in (2), pragmatic inference will involve more processing effort. Yet such a view is counterintuitive because this conventional meaning can be regarded as a lexical meaning as the following fact indicates:

(4)	a. the Lancashire branch to Rawtenstall	[BNC]
	b. strands of {dark curly hair/#seaweed}	[BNC]

In (4a), this expression makes sense without any specific contexts. Although the combination of *strands* and *seaweed* itself is possible in (4b), its metaphorical use and interpretation in the description of dark curly hair requires a specific context. For this reason, it is natural to assume that only the metaphorical meaning in (4a) is lexicalized.

2.3 Cognitive Semantics and Metaphorical Expressions

Lakoff and Turner (1989) and Lakoff (1990) discuss creative expressions that involve configurational similarity between objects. According to these analyses, the interpretation of creative metaphorical expression involves an image metaphor where the shape of an object is mapped onto that of another object in (5). In this case, the shape of a rainbow is mapped onto that of a mane:

(5) My horse with a mane made of short rainbows. (Lakoff 1990: 67)

In a similar case, detailed information about the shape of an object is also mapped as in (6):

(6) Slowly slowly rivers in autumn show
sand banks
bashful in first love woman
showing thighs (Lakoff and Turner 1989: 91)

In this example, the surface of the river is mapped onto a woman taking off her clothes. The color of the sand is also mapped onto the color of the skin. An image metaphor is relevant for the interpretation of this specific expression because objects that have very detailed aspects are mapped onto other things. For this reason, mapping is achieved only in this context. When we explain (2) from the perspective of an image metaphor, we have difficulty in explaining the conventionality of (2). As (4a)

indicates, the metaphorical meaning of *branch* is well-established. That is why this semantic extension can be explained from the perspective of lexical polysemy (Seto (ed.) (2007: 131-132)). If an image metaphor contributes to this meaning, we can explain neither the productivity of this metaphorical meaning nor the established way of mapping.

In some metaphorical expressions, image schemas are mapped (Lakoff (1987: 90)). In image schemas, the structures of recurrent mental images are abstracted and these images are then converted into a simple pattern (Johnson (1987: 2)). In other words, various experiences are generalized and abstracted in these schemas. Take (7) for instance, where the CONTAINER image schema is involved with the metaphorical and abstract meaning of *into* and *out of*.

(7) come into existence, go out of existence (Lakoff 1990: 62)

If we explain (2) from the perspective of an image schema, the conventional quality of this metaphorical meaning can be explained by assuming that the BRANCH image schema is involved. However, this account cannot explain why the shape of an object is the factor to determine metaphorical meanings.

According to Fauconnier and Turner (2002), a metaphorical interpretation is motivated by blending. Take *boxing CEO* for example, where the similarity between a boxer and a CEO is blended because both are competing against their rivals. In this way, it is understood that the CEO is beating his or her rivals in business. For creative expressions, there is a greater difference between the two types of information as in (8):

(8) You are digging your own grave. (Fauconnier and Turner 2002: 131)

In this expression, two different actions are involved, i.e., digging his or her own grave and failing unconsciously. In this case, the information about the specific type of failure is derived from the “unwitting failure” input. In other words, it is inferred that by digging his or her own grave, a person is in danger of an unwitting failure. This metaphorical interpretation is reached by blending this information with the information on digging a grave. If we apply such a view to the explanation of (1)-(2), the input constitutes information about the commonality of the shape of two objects and this commonality of the two objects is blended. However, if we adopt this view, we can interpret both (1) and (2) in the same way while the creativity of (1) is not captured.

In response to these problems, we will see how pragmatic and lexical factors affect the truth of metaphorical utterances. Specifically, we will assume that some metaphorical meanings are pragmatically derived while other meanings are lexicalized. Since we cannot ascertain what specific information is shared between the writer and reader in these expressions, we will focus on the reader’s interpretational processes for these expressions. We will also discuss how configurational information about objects is evoked from these kinds of expressions. Moreover, we will see what

effects are achieved through various interpretational processes. We will also explore the different functions of nouns in conventional and creative metaphorical expressions. By bringing these discussions together, we will ultimately elucidate the factors that lead to the creativity of metaphorical expressions in cases where configurational similarities of objects are involved.

3 THEORETICAL PREMISES: RELEVANCE THEORY

In this paper, we assume that the creativity of metaphorical expressions affects the way of their interpretation and the processing effort needed for this interpretation. We can explore this phenomenon by investigating how disambiguation and deduction play a role in these interpretations. Therefore, we will analyze various metaphorical expressions about the shapes of objects from the point of view of Relevance Theory. Before proceeding to the analysis, we will review aspects of this theory, including the process of disambiguation and deduction.

According to Relevance Theory, a hearer follows a path of least effort to interpret utterances. During this process, the meanings of semantically ambiguous expressions like *bank* are disambiguated. The referents of pronouns and other deictic expressions are also resolved. Moreover, he (the hearer) infers what information is omitted in an utterance as he tries to understand what is explicitly conveyed. He also infers what is implicated in an utterance (Wilson (2002: 4)). In other words, he derives explicatures and implicatures during the process of interpretation.

When we derive implicatures, we draw an inference by utilizing an explicature and various contextual assumptions as premises. Consider example (15) to see how implicatures are derived:

(9) Caroline is our princess. (Carston 2002: 347)

If he knows that Caroline is the princess of Monaco, then (9) conveys a truism. However, if he does not know how Caroline was brought up, he carries out deductive reasoning whereby he draws on the explicit content of this utterance. He also draws on a more general assumption about how princesses are raised. Taken together, these aspects suggest that Caroline is an indulgent and spoiled person. In this case, the information about a princess and the derived conclusion are considered implicatures.

In addition to implicatures, an ad hoc concept is relevant for the interpretation of (9). When an ad hoc concept is constructed, a concept denoted by a word is broadened or narrowed (ibid.: 321-334). The word *princess*, for example, literally denotes a female member of a royal family but the literal concept of PRINCESS is loosened in relation to the implicature given above. This process results in a loose concept of PRINCESS* and this concept includes indulgent and spoiled women who do not belong to a royal family. In this way, an implicature is derived from the content of an explicature. Moreover, an ad hoc concept is constructed in relation to an implicature and the explicit content of an utterance is adjusted. This process of utterance

interpretation is called mutual adjustment. The aim of this paper, however, is to see how disambiguation and deduction determine the metaphorical meanings of nouns. For this reason, we will not discuss how ad hoc concept construction and mutual adjustment contribute to the metaphorical meaning of the shape of objects.

When a metaphorical meaning is conventionalized, it is understood via disambiguation (Wilson and Carston (2007: 241)):

(10) No teenager is a saint. (Wilson and Carston 2007: 240)

In this way, lexical meanings can change after the repetition of deductive reasonings. Consequently, some metaphorical meanings of a word are looked upon as their lexical meanings. For example, the word *saint* has several lexical meanings, because it has been used metaphorically for a long time and deduction has been repeated. For this reason, the word often denotes a virtuous person.

4 METAPHORICAL EXPRESSIONS CONVEYING THE CONFIGURATIONAL INFORMATION

4.1. Lexical Polysemy

In this section, we will see how configurational information about objects affects the degree of creativity of metaphorical interpretations. First, we will discuss the lexicalization of metaphorical meanings. Since these meanings are disambiguated in these expressions, a smaller degree of processing effort is needed. In these expressions, semantic extension occurs based on the similarity of the rough shape of objects. We will discuss these aspects from the point of view of lexical polysemy.

The lexical meanings of a word are classified into core and peripheral meanings. Their relations can be captured by polysemous networks (Lakoff (1987)). For example, the core meaning of the word *ring* is ‘a circular object.’ This meaning can be extended metaphorically so that this word denotes an arena as well as a ring (Langacker (1988: 52)). The arena’s shape may not be entirely circular. As this example shows, the metaphorical extension of a polysemous word is based on the similarity of the rough shape of objects (Taniguchi (2006: 43-45)).

Conventional metaphorical meanings of the shape of objects involve semantic extension in this way. In contrast to creative metaphorical meanings, these meanings cannot be explained through the use of other expressions, as shown in (11) and (12):¹

(11) a. I follow again the familiar profile of the skyline, *its comb of coolingtowers and chimneys* bathed in their vapours. [BNC]

¹ As for the ability of creative metaphorical expressions to be paraphrased, see Sapir (1977: 8).

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- b. I follow again the familiar profile of the skyline, *its array of long and thin coolingtowers and chimneys* bathed in their vapours.
- (12) a. A hen's *comb* is generally smaller than a coxcomb.
 - [<http://www.ithaca.edu/staff/jhenderson/chooks/dual.html>]
- b. # A hen's *sticking out top of the head* is generally smaller than a coxcomb.

Since the metaphorical meaning of *comb* is lexicalized, its meaning cannot be paraphrased as in (11b). There is no other word which denotes the comb of a hen and thus only the metaphorical use of *comb* can capture this meaning. This metaphorical meaning is strongly related to this word.

Moreover, if a metaphorical meaning is strongly related to a word, this kind of meaning is disambiguated:

- (13) a. a hen's comb
- b. # the comb of coolingtowers and chimneys

In (13a), the metaphorical meaning is lexicalized. This expression thus makes sense without any specific contexts and the meaning is disambiguated. In this case, less processing effort is required. In (13b), the metaphorical expression tells us that there is an array of thin objects. Since this interpretation results because of a specific context, it does not make sense out of that context. For this reason, the metaphorical meaning is deducted and its interpretation requires a high degree of processing effort.

Furthermore, the link between metaphorical meanings and words affects the function of metaphorical expressions:

- (14) a. Sister Martha's hair shows under the drift of her veil, it's a dark cloud of seaweed around her pale and drowning face. (=1a))
- b. # *Seaweed* was cut at the beauty salon. (seaweed=curly hair)
- c. # Black curly hair is called *seaweed*.
- (15) a. The top of a hen's head is *a comb*.
- b. A hen's *comb* is generally smaller than a coxcomb. (= (12a))
- c. The top of a rooster's head is called *a comb*.

In creative metaphorical expressions, metaphorical meanings are not related to the words themselves. Instead, these meanings are dependent on specific contexts and the reader often cannot grasp the referents of these expressions. These expressions have a poetic function in relation to a specific context (Hymes (1968: 117)) and thus they are only used as a predicate as in (14a). Original or unfamiliar metaphors, without the help of contextual information, would not identify a topic with any clarity (Cohen 1993: 68)). The utterance in (14b) also presupposes the assertion that curly hair is seaweed; however hair is not always identified in this way.² The information

² The referential use of a metaphorical expression presupposes its attributive use. For more on this point,

structure of a clause is also relevant here. If a creative metaphorical use of a noun appears in a sentence, this noun is combined with other nouns in a novel way. Its metaphorical meaning is not established and thus new information is conveyed in the resulting expression. The referential use of this expression sounds unnatural, but it is used as a predicate of a sentence in order to convey the attribute of other concepts.³ For these reasons, the reader can have difficulty in determining the meaning. In this way, the referential use of *seaweeds* is unnatural here. On the other hand, the reader can easily pick out referents for more conventional metaphorical expressions. These expressions are used as predicates as in (15a) or they can be used as referential subjects as in (15b). In this expression, it is presupposed that the top of a hen's head is a comb. Since this part of a hen's head is always shaped in this way, this presupposition is in the reader's mind and he can easily identify this part with a comb. In this way, the metaphorical use of *comb* is natural in (15b). These expressions can also be used in order to denominate objects in (15c). In these expressions, it is easy for the reader to grasp the configurational information about the object. Consequently, these expressions come to denote objects based on the configurational similarity regardless of specific contextual information. Since the metaphorical meaning is disambiguated, it is considered to be a lexical meaning.

Thus far, we have seen how configurational metaphorical expressions are classified into two types. We will now turn to a discussion of the kinds of conventional expressions. In order to distinguish between these two types, we can classify the meanings listed in dictionaries as conventional meanings. This kind of distinction is arbitrary since dictionaries often reflect editors' subjective views. Instead, we assume that the original meanings of nouns are related to the conventional metaphorical meanings.

First, words that originally denote instruments are used in conventional expressions, as shown in (16)-(18):

- (16) arrow, comb, fork, ladder, net, pad, table, umbrella
- (17) the right-hand fork [BNC]
- (18) a. The left *fork* goes on to the village of Glenelg. [BNC]
- b. Two roads proceeding from a divided road are called *forks*.

For example, the metaphorical use of *fork* can denote the shape of a road without any specific contexts, as shown in (17). This word can also be used referentially as the subject of (18a), and it can be used as a name of something in (18b). The previous discussion pointed out that the use of *comb* also has a similar pattern. In these examples, words that originally denote tools have uses that are directly related to their shape. For example, the shape of a fork is directly related to eating food. Similarly,

see (Lappin (1981: 119)).

³ According to Halliday (1985/1994: 295-302), a clause usually contains given and new information. Given information is usually placed at the beginning of a sentence, followed by new information. Given information is recoverable to a hearer because it has been mentioned in the previous discourse or it is evident from context. New information is not recoverable to a hearer because it is not stated in the previous discourse. New information is thus unexpected and worthy of attention.

the shape of a comb is directly related to brushing hair. In this way, people directly and easily access the configurational information of these words. The metaphorical meanings are thus lexicalized and they are regarded as conventional meanings.⁴

Second, words that originally denote large objects are also used in conventional expressions, as shown in (19)-(22):

- (19) cloud, fog, spray, tower, web
- (20) a. a cloud of dust (Seto (ed.) 2007: 186)
b. a tower of paper cups [BNC]
- (21) a. *A cloud* of dust shimmered up. [BNC]
b. The *tower* of CD-Rs are on my desk.
- (22) a. A mass of floating dust is called *a cloud* of dust.
b. The main unit calculates each decision and the memory of the computer is stored here. There are two different designs of main units. One is called desktop unit and the other is called a *tower*.
[<http://cuip.uchicago.edu/~crjohnson/lab%20web%20pages/computerparts.htm>]

For example, the metaphorical use of *cloud* can denote the shape of a mass of floating objects without any specific contexts, as shown in (20a). This word can also be used referentially as the subject of (21a), and it denominates the mass of these objects in (22a). In (20b), on the other hand, the metaphorical use of *tower* can denote the shape of the stack of paper cups without any specific contexts. This word can also be used referentially as the subject of (21b), and it denominates the mass of these objects in (22b). In such examples, a noun originally denotes large objects or a mass of objects which people encounter in their daily life. For this reason, people access the configurational information of such a word easily. The meaning of such an expression is thus lexicalized and regarded as its conventional meanings.

Third, some words that originally denote livestock are also used in conventional expressions, as shown in (23)-(26):

- (23) cock, horse
- (24) a. turn the cock on the tap (Seto (ed.) 2007: 188)
b. a wooden horse [BNC]
- (25) a. At 4,000 rpm the starter is switched off, its light checked out, the fuel *cock* is moved all the way forward and the engine stabilises at around 7,000 rpm and 400 °C with the most unbelievably skull-splitting shrill piercing shriek. [BNC]
b. With Laocoon dead and discredited, the *wooden horse* is hauled within the city walls. [http://www.acsu.buffalo.edu/~peradott/Journey%20of%20Odysseus/n_Troy%20Burns.htm]

⁴ Traugott (1985) also points out that the use of a noun denoting an instrument makes a metaphorical expression conventional.

(26) a. A water tap is also called a *cock*.
 b. A toy which looks like a horse is called a *rocking horse*.

The metaphorical use of *cock* denotes a tap without any specific contexts, as shown in (24a). This word is also used referentially in (25a) and it denominates another object in (26a). The metaphorical use of *horse* in (24b) displays a similar pattern. In these examples, the words originally denote livestock that people encounter in their daily life and thus the configurational information is easily accessible. Accordingly, the meanings of these expressions are lexicalized and regarded as their conventional meanings.

Fourth, words that originally denote parts of plants are also used in conventional expressions, as shown in (27)-(30):

(27) branch, trunk, stem
 (28) a. the Lancashire branch to Rawtenstall [BNC]
 b. the stem of a wineglass [BNC]
 (29) a. After 2km the left-hand *branch* of the road from Hinterthal reaches the entrance to the remarkable Holloch Caverns. [BNC]
 b. The *stem* is circular in section, with a twisting, grooved design. [BNC]
 (30) a. A diverged road is called a *branch*.
 b. The thin part of a wineglass is called a *stem*.

The metaphorical use of *branch* denotes a diverging road without any specific contexts, as shown in (28a). This word is also used referentially in (29a) and it is used to name an object in (30a). The word *stem* in (27) is used similarly in (28b), (29b), and (30b). In these examples, these words originally denote parts of a plant. Branches and stems are well-known parts of plants and thus people have easy access to the configurational information for these words. In this way, the meanings of these expressions are lexicalized and regarded as their conventional meanings.

Thus far, we have seen conventional metaphorical expressions that have to do with the shape of objects. Nouns employed in these expressions originally refer to large objects, instruments, livestock, and parts of plants. Since we encounter these entities frequently, these nouns are also used in conventional metaphorical expressions. The metaphorical meanings of these nouns do not depend on specific contexts. These nouns are used referentially as the subjects of sentences and they also denominate other objects. Therefore, these metaphorical meanings are lexicalized and grasped via disambiguation. In this respect, these words are polysemous.

In this section, we have seen that the conspicuity and the familiarity of objects affect the conventional use of metaphorical expressions. Other examples further show how these two factors work. In the following examples, the lack of these factors leads to unnatural metaphorical expressions:

- (31) # steam of dust, #hump of paperbacks (cf. cloud of dust, tower of paperbacks)
- (32) # The brush has many long bristles. The *lion* is useful for cleaning the bathroom. (lion=brush: The description of a brush which looks like a male lion's face because of bristles)
- (33) # Beware of the shark. Its *scalpel* kills various animals. (scalpel=tooth: The description of a shark's very sharp tooth.)
- (34) # This *bark* is a dangerous place to walk on. (bark=ragged ground: The description of the ground which is ragged as the bark of a tree)

In (31), steam and cloud are similar, but steam does not spread out and is smaller than a cloud. For these reasons, the use of *steam* is unnatural in this expression. In a similar way, a hump and a tower also appear similar, but the size of a hump is smaller than a tower. For this reason, the use of *hump* is clumsy in this expression. In (32), *lion* denotes an exotic animal whose characteristics are not easily accessible. For this reason, the use of *lion* is unnatural here. In (33), both a scalpel and the tooth of a shark are sharp; however, the use of *scalpel* sounds unnatural because it is an instrument used for a specialized purpose. In (34), a bark is part of a tree; however, *bark* cannot be used as a conventional metaphorical expression because it is the subpart of a tree's trunk. In other words, it is less salient than other parts of a tree, such as trunk and branch. For this reason, the use of the word *bark* sounds clumsy here. The examples given here cannot be generalized in terms of the degree of saliency of and familiarity with objects. For this reason, these expressions cannot be used conventionally and their metaphorical meanings are connected to specific contexts.

There are other expressions whose conventionality can be explained in terms of the conspicuity and the familiarity of objects:

- (35) a. A *sea* of wild cornflowers such as this is a rare sight in the countryside these days. [BNC]
- b. The new *flood* of refugees consequent upon the Russian withdrawal from Afghanistan is straining the relief services. [BNC]
- (36) a. There is a *dish* on the roof of his house.
- b. I know there is a *shelf* in the area that runs parallel to the bank about three yards out, and that the water is eight feet deep at the bottom of the shelf. [BNC]
- c. A *nut* and bolt fixed the handle shafts to the top section. [BNC]
- (37) a. The *bug* was attached to the back of the TV set. [BNC]
- b. A solid *snake* of people still wound back along the north shore of the loch. [BNC]
- c. The *horseshoe* of mountains overlooks the seaside resort of Newcastle in County Down. [BNC]
- (38) a. 'And there's a *bar* of milk chocolate.' [BNC]

b. *Waves* of this same hair swept around the back of Gyggle's head, from coast to coast of his oval face. [BNC]

In (35), both sea and flood are large objects and they are used as metaphors to describe the size of objects. Their large sizes make these objects conspicuous. These examples show that the conspicuity of appearances leads to conventionalized metaphorical expressions. On the other hand, (36) illustrates objects that are usually seen in daily life. Words denoting dish, furniture, and food are used in conventional metaphorical expressions about the shape of objects. In (37a, b), words denoting animals other than livestock are used. Although these words do not denote livestock, they refer to various animals that people encounter in their daily lives. The noun denoting the body part of a livestock is used in (37c). Since the referents of these words are familiar to us, they are used metaphorically in conventional expressions about the shape of objects. In (38), both a bar and wave exist in nature, but they are not regularly seen by people at home. Yet people do encounter them in their daily life and are familiar with these objects. For this reason *bar* and *wave* are used in conventional metaphorical expressions about the shape of objects.

Although the conspicuity and the familiarity of objects contribute to the conventionality of these expressions, the involvement of these two factors should be restricted. Otherwise, our claim on the conventionality of these expressions will also be applicable to unnatural expressions as in (39):

(39) a. # The conference room was equipped with small desks and chairs. It was a *classroom*.
 b. # The area is clear of buildings and expands to two miles. It was an *airport*.

In these expressions, a noun related to public institution or transportation is used. In such a case, its metaphorical use yields an unnatural expression. This is because of their complexity and systematicity. Additionally, non-physical aspects are also at work in public transportation system and social institution. For example, the frequency of public transportation services and the governance of an institution involve more abstract functions. For that reason, we cannot mention the configuration of objects related to the transportation system and public institution. Moreover, a public transportation system and an institution contain various parts such as facilities and departments.

We should note however that a vehicle itself is not classified into a systematic entity. Instead, it should be classified as an instrument. Take a boat for example. It is not always included in a transportation system, for a person can row it at his or her own will. Besides, it is not necessarily divided into separate parts unlike an institution or a transportation system. For that reason, a vehicle such as a boat is classified as an instrument for a physical activity. Accordingly, the use of a conventional metaphorical expression like *gravy boat* is possible.

Thus far, we have seen how the familiarity and saliency of objects affect the conventionality of metaphorical expressions. We observed that nouns originally

denoting less salient and less familiar objects are not used in conventional expressions; rather, nouns originally denoting these objects are used in more limited ways. Metaphorical meanings will be more creative if these conditions are met. By observing this general tendency, we are able to explain the productivity of and the constraints on these expressions. According to Seto (ed.) (2007), the configurational similarity of two objects leads to lexical polysemy; however, it is still unknown what motivates this mechanism of meaning change. According to our analysis, such a mechanism is motivated by this general tendency.

4.2 On the Frequency of Metaphorical Expressions Related to Shape

It is possible to distinguish between the creative and conventional metaphorical uses of nouns by investigating their frequencies in British National Corpus. As (40) shows, conventional expressions are used more frequently in contrast to the creative ones shown in (40):

- (40) down arrow (58), left fork (18), neural net (36), dust cloud (16), stack of NP (146), rocking horse (41), stem of NP (36), a flood of (138), shelf (11), locking nut (10), horseshoe of (9), chocolate bar (42), iron bar (37), cross bar (10)
- (41) seaweed (1), scallop of (1)

As (40) shows, when nouns are used metaphorically to convey the shapes of objects as their lexical meanings, these nouns occur more frequently. On the other hand, as (41) shows, when nouns are used to transmit pragmatic meanings, they are used less frequently. Therefore, the metaphorical meanings of the shape of objects are understood in relation to each context.

Conventional metaphorical expressions related to the shape of objects can also refer to more varied things, as shown in (42) and (43):

- (42) a. I approached the compost heap and saw a small *cloud* of whiteflies rise from it. [BNC]
- b. A jeep trailing a *cloud* of dust was speeding in my direction. [BNC]
- (43) a. Fanny ate a whole fowl for breakfast, to say nothing of a *tower* of hot cakes. [BNC]
- b. There were plenty of filing cabinets, with half-full bottles, and an empty water cooler that I evidently kept as an excuse to have a *tower* of paper cups. [BNC]

In (42), *cloud* describes a swarm of whiteflies and a mass of dust. In (43), *tower* depicts a number of cakes and paper cups. Compared with these expressions, the

expressions in (43) describe more limited situations. These examples also show that conventional expressions are more widely used and, to a lesser extent, depend on contextual information.

As for the frequency of these expressions, it is correlated with the familiarity and the conspicuity of objects. If an object is familiar or conspicuous to people, they have more opportunities to talk about it. In such a case, the literal meanings of nouns are grasped easily, and the configurational information on such an object is easily accessible without detailed contexts. For that reason, such information is also applicable to the understanding of the shape of other various objects, and these nouns are also used in their metaphorical senses frequently. If such an object is unfamiliar or inconspicuous, they have lesser opportunities to talk about it. In this case, the literal meanings of nouns are not understood easily. That is why the information on the shape of such an object cannot be grasped easily. Therefore, such information cannot be used as the clue to recognize the shape of other objects without specific contexts, and these nouns are used in their metaphorical senses less frequently. As a consequence, such an object is used as the criterion of grasping the shape of other objects.

Thus far, we have focused on various conventional metaphorical expressions that describe the shape of objects. Specifically, we have discussed their frequency levels and productivity. We have observed that these conventional expressions appear frequently and they are productive. Since they are highly productive, the configurational information about various objects seems to be simplified. For that reason, the metaphorical uses of these expressions denote various objects.

4.3 Why Are Two Interpretational Processes Involved?

Thus far, we have seen that familiar or salient objects often lead to conventional uses of metaphorical expressions. An additional explanation, however, is also possible.

As discussed in section 4.1, these types of expressions are metaphorically used chiefly to denote roads, mass of objects, and other tools. It follows that these conventional expressions can also refer to other entities that are equally familiar to us. The shapes of these entities are also highly accessible to the hearer or reader, which is why their interpretations do not involve deduction.

In the cases of creative expressions such as (1a) and (11a), the shapes of less familiar objects are related to their metaphorical meanings. As previously discussed, (1a) represents the description of a woman's hair where *seaweed* is used metaphorically. In (11a), an array of coolingtowers and chimneys are compared to a comb. In (1a), seaweed is a type of plant that appears in limited places. For this reason, its configurational information is less accessible. In (11a), the reader interprets the unusual appearance of a factory. Since these characteristics are less accessible, this information is only available as the result of deduction. As these examples show, the shape of less familiar entities leads to processes of deduction.

4.4 The Analysis of Interpretational Process

In this section, we will see how metaphorical expressions describing the shape of objects are interpreted. First, we will discuss how the exact shape of an object is related to the creativity of a metaphorical expression. In the following example, the entire shape of a comb encourages creativity in its metaphorical use. As previously discussed in section 4.1, the word *comb* conveys configurational information about the hen's head as its lexical meaning. This word can also be used for other purposes depending on specific contexts as shown in (44):

(44) a. I follow again the familiar profile of the skyline, its *comb* of coolingtowers and chimneys bathed in their vapours, brewing up one more prismatic sunset. [BNC]

b. Behind the window, the putty face watched as a Moran, large and grey-speckled with red *comb* and wattles picked her way across the gravel carriage sweep, paused for a moment beside the bed of unpruned roses and was swallowed up in the shadows of the shrubbery. [BNC]

In (44a), its interpretation is achieved via the process of deduction. In this process, the reader uses the information stated in the explicature. The reader derives an assumption about the shape of a comb, i.e., that a comb has many thin teeth lined in a row. By deducting an implicature from these two premises, it is understood that many thin coolingtowers and chimneys are also lined up in rows. In this way, a loosened ad hoc concept COMB* is derived and related to the shape and orderliness of these objects. In other words, the attributes of a comb are deducted. The arrangement of coolingtowers and chimneys is classified on the basis of these attributes. The shape of coolingtowers and chimneys is not necessarily similar to that of a comb, so these objects are not linked strongly. Yet, in terms of the description of the landscape, the reader infers the similarity of these objects based on this specific context. Since detailed information about the shape of coolingtowers and chimneys is understood, this metaphorical expression is creative. The interpretation process involves more processing effort because this detailed information is used as a premise; however, many cues are provided in order to understand the shape of another object. The semantic extension in (44b) suggests that the comb of a hen is understood. In this case, its rough shape is partly similar to that of a hair comb. For this reason, this word denotes another object whose shape is similar to a hair comb. Since the nouns originally have this characteristic, the metaphorical meaning is lexicalized and disambiguated. As this example shows, the referent of a noun can be transferred in order to name another object in metaphorical expressions (Stern (1931: 294)). For these reasons, the metaphorical meaning is conventionalized and the expression has a referential function. The comb of a hen necessarily consists of an array of thin objects and the rough shapes of a hair comb and a hen's comb are similar. Thus these two objects are strongly linked in this respect. Accordingly, this word can denote other objects similar to a hair comb and the interpretation of these expressions requires less

processing effort.

In the following example, the three-dimensional shape of objects affects the creativity of expressions. In (45a), a particular rock is metaphorically described. For this reason, the interpretation of these expressions is achieved via deduction:

(45) a. He led me to a large, upright *scallop* of rock. He pointed to Huayna Picchu; he pointed to a chisel of rock. [BNC]
 b. After 2km the left-hand *branch* of the road from Hinterthal reaches the entrance to the remarkable Holloch Caverns. (= (29a))

When the reader deducts the metaphorical meaning, he uses the information stated in the explicature. In this case, the reader also derives the assumption that the shape of a scallop is thin. The reader also derives the assumption that its shape is jugged. By deducting an implicature from these premises, it is understood that the rock is thin and jugged. If this information is interpreted as an implicature, the reader can understand the attributes of the rock. A loosened ad hoc concept SCALLOP* is also constructed here and contains the same information. If we compare a scallop and a rock, their shapes are not always similar and the link between them is not close. Therefore, he has to interpret the detailed aspects of their similarity in relation to the context. In this way, the detailed three-dimensional shape of the rock is understood. In other words, an instance of a rock is classified on the basis of its attributes that are implied here. Since the three-dimensional configurational information is deducted, a great deal of processing effort is required to interpret this expression. On the other hand, in (45b), only two-dimensional information about the shape of the road is conveyed. In this semantic extension, the rough similarity of the shapes of two objects enables this word to denote other objects (Taniguchi (2006: 43-45), Seto (ed.) (2007: 131-132)). Since nouns originally have this characteristic, the metaphorical meaning is lexicalized and disambiguated. This conventional meaning comes from the nature of a road which necessarily diverges. The approximate shapes of these two objects are similar and the link between them is close. Accordingly, *branch* can denote other objects that are similar to a tree branch and its interpretation requires lesser processing effort.

In the next example, the three-dimensional shape of an object has nothing to do with the metaphorical interpretation; however, this expression is also regarded as a creative one. The following expression involves the object that is not listed in 4.1:

(46) Sister Martha's hair shows under the drift of her veil, it's a dark cloud of *seaweed* around her pale and drowning face. (= (1a))

The creative metaphorical use of *seaweed* requires the reader to draw on information stated in the explicature. The reader derives the assumption that seaweed is long and curled. By deducting an implicature from these two premises, it is understood that Sister Martha's hair forms a dark mass of long and curly objects. It is also possible to derive the assumption that seaweed is ugly. Following this assumption, the ugliness of

her face is also becomes an implicature. If these two kinds of information are derived, a loosened ad hoc concept SEAWEED* is constructed and this information about her face is included in this concept. In this interpretational process, the two-dimensional configuration of seaweed contributes to the understanding of the attributes of the woman's face. Additionally, the entire shape of seaweed is evoked, and detailed configurational information about seaweed is employed as a premise to draw an inference. Accordingly, the reader can clearly understand what Martha's face is like. The description of somebody usually involves the evaluation of his or her appearance. In this way, the reader also understands the evaluation of the woman's appearance. Since the shape of seaweed is not necessarily similar to that of hair, the link between these two things is not strong. Yet the reader understands the similarity of these objects in great detail in the context of describing the woman's face. In this way, a woman's face is classified on the basis of its attributes implied here. Detailed information is used as a premise in this creative expression and its interpretation involves more processing effort. Many cues are provided, however, to grasp the shape of another object.

In this section, we have seen the different interpretive processes for creative and conventional metaphorical expressions that describe the shape of objects. In conventional expressions, part of an object and its shape are similar to other objects and metaphorical meanings are lexicalized. For this reason, the reader pays attention to the limited aspects of an object in order to understand its metaphorical meanings. In this case, the two objects involved in a metaphorical expression are necessarily similar and the metaphorical meaning is understood through a process of disambiguation. In creative metaphorical expressions, the information about the entire shape of an object contributes to the process of deduction through which the object's attributes are pragmatically understood. In these cases, the reader pays attention to more varied configurational aspects of entities in order to achieve metaphorical interpretation. These metaphorical expressions also evaluate other objects. There are some differences in the interpretive process, amount of processing effort required, and the nature of metaphorical meanings. For creative expressions, the reader has to deduct implicatures and this procedure complicates the interpretive process. This kind of process employs more detailed configurational information about an object in relation to a specific context, and consequently, detailed configurational information about another object is understood. The interpretations of these expressions thus require more processing effort. In these cases, the shapes of two objects are not necessarily similar but the reader understands their similarity in great detail.

4.5 The justification for deduction

In 4.3, we saw how metaphorical expressions are interpreted via the process of deduction. In this section, we will see how this interpretive process is justified.

When the process of deduction is required for the interpretation of these expressions, various assumptions are evoked. These assumptions can be tested in the following way:

(47) orderly as teeth of a comb, long and curled as seaweed, jagged as a scallop

The above represents a test to check the assumptions derived from the creative metaphorical uses of *comb*, *seaweed* and *scallop*. Since the configurational information discussed in 4.1 showed that nouns can be combined in this way, this configurational information is not derived haphazardly. By combining nouns in this way, we see how the metaphorical expression describes the appearance of an object.

When a metaphorical expression is used for the evaluation of a person's appearance, the validity of the inference is ascertained in the following way:

(48) ugly as seaweed

The combination of an evaluative expression and a noun in (48) shows that the assumption of the evaluation is also derived from the process of deduction. For this reason, the inference the reader made in order to evaluate another object is justified. This method of combination is possible when somebody's appearance is described by using a metaphorical expression.

We have ascertained what assumptions readers make in understanding the shape of objects. Since configurational and evaluative information can be combined with a noun in a phrase, it is justified that this information is derived from the metaphorical use of a noun via deduction. For this reason, the assumption is not derived haphazardly.

5 HOW TO JUSTIFY THE TWO WAYS OF INTERPRETATION

Thus far, we have seen that metaphorical expressions that have to do with the shape of objects are interpreted via disambiguation or deduction. Now, we will see whether such a claim can be justified.

For conventional expressions, the mental images of objects are not mapped onto the configurations of other objects depending on each context. Instead, the process of mapping is generalized. For example, nouns originally denoting various large objects can be used metaphorically by referring to a mass of other large objects. The shape of one object can be mapped onto a variety of entities when they share a certain shape in common. For instance, the shape of a comb can be mapped onto other shapes such as a group of coolingtowers and chimneys. The shape can also be mapped onto the comb of a hen. In addition, its shape can be mapped onto the shapes of honeycomb and the musical comb of a music box (Seto (ed.) (2007: 193)). Furthermore, the specific shape of an object is not necessarily mapped onto the shape of another object. For example, a shelf is made with a wooden or metal plank and it forms a ledge. When the word *shelf* denotes other objects metaphorically, it refers to a place at the bottom of the sea or a river and its shape is quite different from a shelf one would place on a

wall. This type of semantic extension illustrates how configurational information about an object is generalized to the extent that it can be applicable to a variety of other entities. These aspects of meaning change are related to various kinds of other conventional expressions, as discussed in section 4.1. When metaphorical meanings are conventionalized, the mental image of an object is not mapped onto that of others in specific contexts. Instead, these meanings arise via a process of disambiguation, since concrete nouns originally have these meanings.

There is another possible explanation for the justification of disambiguation. When an image schema is involved with conventional meanings, this schema is applicable to both concrete and abstract domains. For example, the CONTAINER image schema is related to the inclusion of an object and involvement in an activity. Other metaphorical expressions discussed in section 4.1 can also be explained in the same way. For example, the word *web* can be used in the description of an abstract domain, as shown in (49). The same is also true of (50):

- (49) Where a family no longer exists, neighbourhood organisations can provide a *web* of family-like relationships. [BNC]
- (50) A *branch* of science, organic chemistry, is witness to their complexity. [BNC]

Web refers to the relation between people in (49). It is impossible that each member of neighborhood organizations is linked together by strings like a cobweb; however, *web* is used here. In (50), a discipline of science is mentioned and no concrete shape of an object is described. As these examples show, *web* and *branch* can denote both concrete and abstract entities metaphorically, and we can assume that there are image schemas for each of these metaphorical meanings. We can assume that the NETWORK and BRANCHING image schemas may affect these kinds of meaning extensions. When it comes to the use of *cock* and *comb*, these words cannot be used metaphorically for the description of abstract domains. For this reason, an image schematic account cannot explain this type of meaning change. If we adopt the notion of disambiguation, this type of restriction on metaphorical meaning is not involved, because the conventional metaphorical meaning is motivated by the process of disambiguation.

The following example makes clear the process of deduction. Consider (51) (= (46)) again:

- (51) Sister Martha's hair shows under the drift of her veil, it's a dark cloud of *seaweed* around her pale and drowning face. (= (46))

As previously discussed, we understand the length and curliness of Martha's hair in (51) because seaweed has a particular kind of shape. As a result of this appearance, seaweed is regarded as an ugly plant. In turn, we understand the ugliness of Martha's hair. The following expressions represent other characteristics that are also understood:

(52) a. Her hair is untrimmed as seaweed.
 b. Her hair is trailing as seaweed.

As (52a) indicates, it is probable that Martha's hair is untrimmed. Since people do not trim seaweed, this characteristic of seaweed leads to the understanding of her untrimmed hair. The utterance in (52b) indicates that Martha's hair is also trailing like seaweed. Seaweed trails in the sea and this feature of seaweed is also true of her hair. As these examples show, seaweed has various configurational features and they enable the reader to understand various aspects of Martha's hair. In this way, the metaphorical expression in (51) conveys various implicatures. Given the variety of implicatures, it is unlikely that the writer and reader share the same information about seaweed and Martha's face. It is more likely that the interpretation is indeterminate. If we apply speech act theory to this expression, the indeterminacy of metaphorical meanings cannot be explained. Therefore, we have to assume that deduction is involved in order to understand a creative metaphorical meaning. The reader has the complete responsibility for figuring out this interpretation.

Further explanation of these two interpretive processes is also possible, as shown in (53) and (54):

(53) # Although it is a fork, it is not diverged.
 (54) a. Although it is seaweed, it is neither long nor curled.
 b. Although it is seaweed, it is not ugly.

As we have previously discussed, both *fork* and *seaweed* metaphorically describe the shape of other objects. *Fork* is used in a conventional expression whereby the metaphorical meaning is lexicalized. In this case, configurational information cannot be negated as in (54). This information is regarded as lexical information. Since semantic extension is achieved on the basis of this kind of information, a conventional metaphorical meaning is derived via disambiguation. The word *seaweed* is used in a creative expression whereby the metaphorical meaning is pragmatic. In this case, configurational information can be negated as in (54a, b), and this information is related to specific contexts. Moreover, this type of information is derived optionally. Optional information about the shape of objects contributes to creative metaphorical meanings and the process of deduction leads a reader to understand these meanings. These reasons justify the involvement of disambiguation and deduction.

In this section, we have discussed the validity of our analysis. In particular, we have examined the process of disambiguation, ad hoc concept construction, and deduction. In the discussion, we clarified that some meaning changes follow a set pattern and can be generalized. In these cases, specific contexts do not affect the general meanings of concrete nouns. Instead, these meanings are grasped via disambiguation because they are established. The metaphorical expressions dealt with in this paper are classified into two types with regard to the specificity and generality of figurative meanings. Specifically, there are both established and un-established metaphorical meanings. Un-established meanings are derived in relation to a particular context, and the meanings concern particular configurational aspects of

other objects. In these cases, there is no set pattern of meaning change and deduction, and thus ad hoc concept construction lead to the understanding of metaphorical meanings. Given this dichotomy between the two types of meanings, the involvement of disambiguation and deduction can be justified. Additionally, creative metaphorical expressions convey various implicatures. Since various interpretations are possible, it is unlikely that the reader can determine the writer's intended meaning. It is natural to assume that readers have the responsibility to deduct metaphorical meanings.

6 CONCLUSION

In this paper, we have analyzed metaphorical expressions describing the shape of objects. In particular, we have seen how these expressions are interpreted in two ways depending on the degree of their creativity. We have also discussed how this creativity emerges. According to our analysis, different types of configurational information are evoked depending on their creativity. These differences determine the types of metaphorical interpretations and the ways they are comprehended. In this way, metaphorical interpretations are achieved via disambiguation or deduction. This analysis allows us to capture the ease of interpretation, the clues to metaphorical interpretation, and the types of metaphorical meanings in relation to their creativity. When we interpret conventional expressions, we pay attention to the rough shape of objects. The familiar shape of one object provides clues to understanding the metaphorical meaning. In contrast, when metaphorical expressions are more creative, the detailed shape of an object conveys configurational attributes of other objects in detail. In these cases, metaphorical meaning is figured out on the basis of the configurational information of an unusual object. The unusual shape of another object is understood metaphorically. In this case, we can see how some metaphorical meanings are lexicalized and how some pragmatic meanings are derived in relation to specific contexts. Given that the metaphorical uses of concrete nouns have different characteristics depending on the conventionality and creativity of their meanings, it is clear why two ways of interpretation are involved.

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