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## A COGNITIVE ACCOUNT OF SYNAESTHETIC METAPHOR\*

### 1 INTRODUCTION

This paper is concerned with an incongruous kind of adjective-noun modifying relations, i.e. *synaesthetic metaphor*, as in the following phrases:

- (1) How *sweet* the moonlight sleeps upon this bank!  
Here will we sit and let the sounds of music  
Creep in our ears; *soft* stillness and the night  
Become the touches of *sweet* harmony.

(Shakespeare, *The Merchant of Venice* 5.1.54-57, italics mine.)

The adjectives *sweet* and *soft* do not depict genuine sensations of the terms' own, i.e. taste and touch sensations, respectively. This figurative expression is generally defined as 'the use of metaphors in which terms relating to one kind of sense-impression are used to describe sense-impressions of other kinds' (*OED*, s.v. *synaesthesia*, n.2). Take the following examples:

- (2) a. warm/cold colors  
b. a sweet voice

In (2a) adjectives for touch impression are combined with a noun for sight, and in (2b) an adjective for taste modifies a noun for sound. However, we cannot freely select the source and target sensory modality for a synaesthetic metaphor.

- (3) a. \*a lighted coldness  
b. \*an yellow taste

Such metaphorical transfers are not as acceptable as those from sight to touch modality like (3a) or as those from sight to taste like (3b). The directionality of the synaesthetic transfers has been studied diachronically or synchronically (Ullmann 1951, Willams 1976, *inter alia*).

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Our concern here is to consider the synchronic directionality of the transfers between the five basic sensory modalities (i.e. touch, taste, scent, sight, and sound) from the viewpoint of cognitive linguistics, which sees that human language relates deeply to the way we cognize the surroundings. To begin with, we will confirm the characteristics of synaesthetic metaphors by surveying observations based both on synchronic and on diachronic data. Section 3 reviews the previous analyses of the directionality of the transfers and points out problems. In section 4 we consider cognitive factors required for synaesthetic transfers and explain the directionality of the metaphorical mappings.

## 2 OBSERVATION

A good place to start is to observe the linguistic phenomenon itself. In this section we will consider the characteristics of synaesthetic metaphor referring to three main previous studies, Ullmann (1951), Willams (1976), and Yamanashi (1988).

First, Ullmann (1951) considered synaesthetic metaphors taken from poetical works in English, French, and Hungarian in 19th century.<sup>1</sup> He made a distinction between six levels of sense-categories, which included touch, heat, taste, scent, sound, and sight, and supposed that they are the more 'differentiated' or higher sensations in that order. The results of his synchronic study are summarized under three headings: hierarchical distribution, predominant sources, and predominant destinations.

The hierarchical distribution in synaesthetic metaphor means that 'transfers tend to mount from the lower to the higher reaches of the sensorium, from the less differentiated sensations to the more differentiated ones, and not *vice versa*' (Ullmann 1951:280) as in the following table:

Upward	Downward	Total
1665	344	2000

(Ullmann 1951:282)

<Table 1>

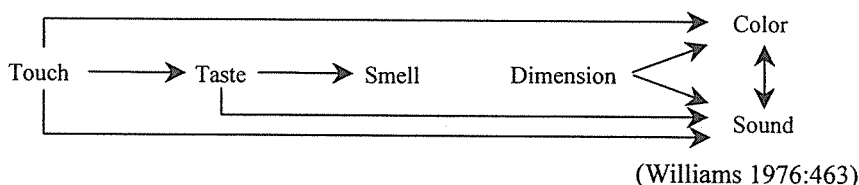
The second point is that the predominant source should be the modality of touch, i.e. 'touch, the lowest level of the sensorium, should be the main purveyor of transfers' (Ullmann 1951:282). According to his observation, in Keats, for instance, 56 out of 173 synaesthetic expressions are transferred from touch modality as the source, though it is only one of six possible ones.

The third result concerns the other end of the transfers, the predominant destination. The main target of the transfers is not the visual field but the acoustic one, although Ullmann (1951) himself admits this result as 'somewhat unexpected' from the hierarchical distribution above. For this result, he only gives a tentative explanation that 'visual terminology is incomparably richer than its auditional counterpart' (Ullmann 1951:282).

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<sup>1</sup>The data is from the following eleven poets: George G. Byron, John Keats, William Morris, Oscar Wilde, Ernest Dowson, Ambrose Phillips, Lord Alfred Douglas, Arthur Symons, Henry W. Longfellow, Leconte de Lisle, and Theophile Gautier.

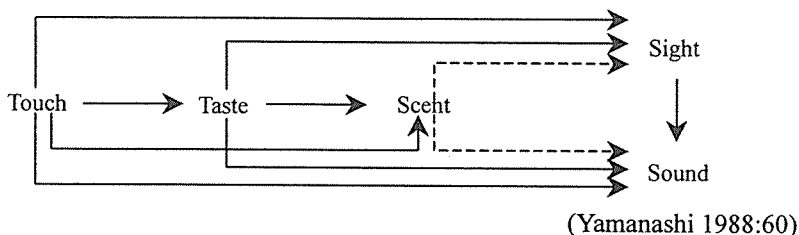
Williams (1976) examined the diachronic semantic transfers of English adjectives in synaesthetic metaphors based on *OED* and *MED*, where he adopts six levels of sense-categories, i.e. touch, taste, smell, dimension, color, and sound. His observation is summarized in the figure as follows:



<Figure 1>

He also reports that this directionality of diachronic transfers in synaesthetic metaphors is to a considerable extent true for other Indo-European languages (Greek, Italian, Latin, and Middle High German) and for Japanese as well.

Examining synaesthetic metaphors in Japanese prose (present-day novels and newspapers), Yamanashi (1988) observed the directionality of the synchronic transfers based on the five basic sensations, i.e. touch, taste, scent, sight, and sound, and gives the results in the following figure:<sup>2</sup>



<Figure 2>

He reports that the directionality above basically holds true in the transfers between the five sensory modalities in English examples.

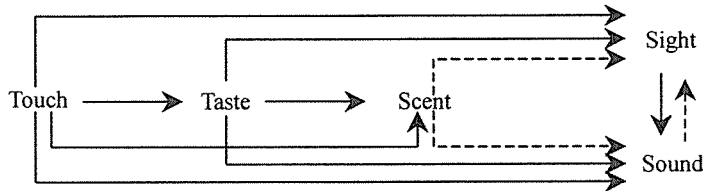
We have now considered the general tendency of the directionality of the transfers between sensory categories in synaesthetic metaphors, synchronically and diachronically. The reason why we seemed to have discovered a similar tendency in the metaphoric transfers is a question which we want to reserve for later discussions.

In order to examine the synchronic transfers of synaesthetic metaphor, we adopt here Yamanashi's (1988) observation, not only because it is obtained from synchronic data which are not limited to poetic expressions, but also because it is based on our five basic sensory categories.<sup>3</sup> As Komori (1992) points out, however, it is inaccurate to say that sound sensations cannot be the source for other sensory

<sup>2</sup> The broken lines in the figure mean that the tendency of the transfer is relatively weaker than other transfers.

<sup>3</sup> Kunihiro (1989) and Yamada (1992, 1994) provide rather different types of patterns of synaesthetic transfers from those we have seen in this section. We cannot adopt them in this paper, because Kunihiro is not clear on the direction of the transfers from scent modality as the source, and because we cannot judge whether Yamada's results are synchronic or diachronic since they are based on both kinds of data equally.

categories. Considering that we have such expressions as *quiet colors*, Figure 2 needs a minor modification in that we should add a broken line from Sound to Sight as follows:



<Figure 3>

Thus, we adopt here the diagram above as the general tendency of synaesthetic transfers between the five basic sensory modalities.

### 3 PREVIOUS STUDIES ON TRANSFERS

We will overview here three kinds of previous analyses on synaesthetic transfers, which discuss why the directional tendency arises. Then we will suggest problems in these theories, and we will provide a more convincing explanation for the directionality in section 4.

#### 3.1 Lower to Higher Modality Hypothesis

The first scholar to give much attention to the directionality of synaesthetic transfers is Ullmann (1951), who propounds a theory, which we call in this paper 'Lower to Higher Modality Hypothesis', that is based on the first result of his observation that, as we saw in the previous section, 'transfers tend to mount from the lower to the higher reaches of the sensorium, from the less differentiated sensations to the more differentiated ones, and not *vice versa*' (Ullmann 1951:280). This theory crucially depends on the hierarchy of the sensory modalities in terms of 'differentiatedness'.

#### (4) Ullmann's (1951) Differentiatedness Hierarchy:<sup>4</sup>

Touch < Heat < Taste < Scent < Sound < Sight

This theory is followed by Ikegami (1978), Yasui (1978), and Kunihiro (1989).

According to this theory, synaesthetic transfers have a general tendency from less differentiated sensory categories (touch, taste, and scent in the five basic senses) to more differentiated sensory categories (sound and sight). This is because, as Yasui (1978) points out, we often come across a situation for which we do not have any suitable term, i.e., we do not have sufficient genuine expressions to describe each discernable sensation which we can distinguish. Thus, we have to employ a

<sup>4</sup> In this hierarchy 'A < B' means that 'A is less differentiated than B.'

relatively less differentiated sensory term which we have already acquired in order to describe a more differentiated sensation which we cannot describe straightforwardly, in the way of metaphorical borrowing. Along the same line, Ullmann (1951) explains the unexpected direction between sight and sound as follows:

Visual terminology is incomparably richer than its auditional counterpart, and has also far more similes and images at its command. (Ullmann 1951:283)

Basically we agree with this theory, but we would like to provide a more accurate explanation for the tendency of this directionality in this paper.

### *3.2 Process of Development/Evolution Hypothesis*

The Process of Development/Evolution Hypothesis was advanced by Williams (1976) based on diachronic data of synaesthetic metaphors, and this theory is supported by Yamanashi (1988). It explains that the directionality of metaphorical transfers is a reflection of the process of our sensory development, i.e., touch sensation is the most primitive sense of the five basic senses and is regarded as the lowest one, while sight and sound sensations develop in relatively later stages and are regarded as the higher sensations. And those sensory terms at relatively earlier stages in the development are employed for newly developed sensations as a sort of metaphorical extension, so that those later-developed, higher sensory categories rarely occur as the source of synaesthetic transfers. Williams (1976), furthermore, goes on to suggest that the process of our sensory development is parallel to the process of sensory evolution:

[T]he physical evolution of the sensory modalities appears to follow the order of transfers: ... Paralleling this phylogenetic sequence is the ontogenetic history of the human neonate's sensory maturation. (Williams 1976:472-473)

We cannot provide evidence either for or against this theory, and we cannot say for certain that there is a parallelism between the two processes: sensory development and sensory evolution.

### *3.3 Accessibility Hypothesis*

Let us overview the Accessibility Hypothesis, which we will follow and refine in the next section. Developing Tsur's (1992) examination of the naturalness of synaesthetic transfers, Shen (1997) proposes the following cognitive constraint determining the directionality, based on the Hebrew corpus: <sup>5</sup>

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<sup>5</sup> The Hebrew corpus, as Shen (1997) says, consists of 130 instances of poetic synaesthesia which are taken from the writings of 20 modern Hebrew poets active during the first eighty years of the twentieth century.

(5) General Cognitive Constraint:<sup>6</sup>

A mapping from more accessible or basic concepts onto less accessible or less basic ones seems more natural, and is preferred over the opposite mapping. (Shen 1997:54)

In order to measure the accessibility in the relationship between a perceived entity and the perceiver, Shen proposes the following two factors that affect it:

- (6) a. The directness of the contact between the sense which perceives and the perceived entity.  
 b. The existence, or lack thereof, of a special organ in the human body by means of which the entity is perceived.

(*ibid.*)

The first factor (6a) means that lower modalities, in Ullmann's Hierarchy, exhibit direct contact (e.g., touch and taste, and to some extent even scent) and are more accessible, while higher modalities (sight and sound) exhibit no such contact and are less accessible. The second factor (6b), on the other hand, tells that the lowest modality (touch) does not use a special organ, while the other modalities do use such organs which exist on an intermediate level between the perceiver and the perceived entity, thus they contribute to making the higher modalities less accessible. Taken together, Shen's Accessibility Hierarchy is summarized as follows:

(7) Shen's (1997) Accessibility Hierarchy:<sup>7</sup>

Touch > Taste > Scent > Sound/Sight

The sensations perceived through touch are the least mediated since they are characterized as direct contact and lack a specific mediating organ. These are followed by taste which involves direct contact but is mediated via a perceiving organ. The next accessible modality is sense of smell which displays an even smaller degree of direct contact. And the least accessible modalities are sound and sight which have the most remote contact compared with the other sensations.

According to the General Cognitive Constraint (5) based on the Accessibility Hierarchy (7), Shen explains the natural and acceptable direction of the synaesthetic transfers between the five sensory modalities, for instance, *a cold light* (touch → sight) is more natural than *a lighted coldness* (sight → touch). We will follow this theory and refine this in the next section and later to provide a better explanation of the directionality of the metaphorical transfers.

### 3.4 Problems

Before providing our analyses, we should point out the problems in the previous

<sup>6</sup> Shen also argues that the General Cognitive Constraint is applicable to simile and zeugma as well.

<sup>7</sup> In this hierarchy 'A > B' means that 'A is more accessible to the perceiver than B.'

studies mentioned above. None of these hypotheses that we have just overviewed, whether diachronic or synchronic, even Shen's (1997) cognitive account, can predict sufficiently at least the following two points.

First, they regard the sense of smell as a relatively lower sense category, whose accessibility is rather high, and therefore predict that it is likely to be the source modality of synaesthetic transfers for sight and sound which are regarded as higher sense categories and are less accessible than scent. However, we do not have such mappings from scent to the sight/sound category as freely as in Figure 3 which diagrams the general tendency of synaesthetic transfers between the five sensory categories. Actually we have some counter examples to the prediction as follows:

- (8) a. \*a fragrant color
- b. ?? an aromatic sound

We also have such examples in Japanese:

- (9) a. \*kusai iro  
       stink color
- b. % kaguwasii oncho  
          fragrant sound-harmony

Therefore, the sense of smell is not as free as one might consider to be the source modality in synaesthetic metaphors.

Second, previous studies cannot predict the directionality between sight and sound modalities in synaesthetic transfers. Ullmann (1951) himself admits that it is 'unexpected' from his hierarchy that 'the acoustic field emerge[s] as the main recipient, distinctly superior to the visual domain which would have been just as eligible from the hierarchical point of view' (Ullmann 1951:283). As in Figure 3 above, we observe the asymmetry in the mappings between sight and sound modalities, for instance:<sup>8</sup>

- (10) Sight → Sound
  - a. a colorful sound
  - b. a transparent sound
  - c. a clear sound
- (11) Sound → Sight
  - a. ?a noisy color
  - b. ?a silent color
  - c. \*a shrill color

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<sup>8</sup> We also have examples which show that the asymmetry between sight and sound modalities is not a clear-cut type of distribution, which is diagramed in Figure 3:

- (i) Sight → Sound
  - \*a red sound
- (ii) Sound → Sight
  - √a loud/quiet color



This directional tendency cannot be predicted by Shen's (1997) cognitive account, the Accessibility Hierarchy (7) above, either.

We can summarize the problems of the previous studies in the following two questions:

- (12) a. Why is it that smell related concepts are not likely to be transferred to those of sight or sound?
- b. Why is it that the transfers from sight concepts to those of sound are preferable to transfers in the opposite direction?

We will answer these questions in the following section by refining Shen's (1997) cognitive account and also explain various other aspects in greater detail which have not been touched on so far.

#### 4 COGNITIVE ACCOUNT

In this section we will provide our explanation for the directionality of synaesthetic transfers by refining Shen's (1997) cognitive account. In addition to the general tendency of this directionality, we will consider the motivation underlying the creation of these metaphors, which has been untouched on in previous studies.

##### *4.1 Refinement of Shen (1997)*

In order to explain the directionality of the synaesthetic transfers between the five basic sensory categories, we follow the Accessibility Hypothesis (Tsur 1992, Shen 1997) which is based on the General Cognitive Constraint (5), and we will refine it for a better description of this linguistic phenomenon.

Shen (1997) proposes two factors which determine the accessibility of the perceived entity to the perceiver, as we have already surveyed in (6), and we requote here again as (13):

- (13) a. The directness of the contact between the sense which perceives and the perceived entity.
- b. The existence, or lack thereof, of a special organ in the human body by means of which the entity is perceived.

We propose here the third factor which affects the accessibility of the perceived entity to the perceiver as follows:

- (14) The possibility that the perceiver can identify the source of the stimulus perceived.

According to this factor of identifiability of the stimulus source, we have the

Accessibility Hierarchy as follows:

- (15) Accessibility Hierarchy only on the factor (14):  
Touch/Taste/Sight > Scent/Sound

The important point to note is that scent sensation, which has been regarded as a lesser differentiated and lower sensory modality, is ranked as more accessible than the sight sensation. We can cite the following examples which support this:<sup>9</sup>

- (16) a. I could smell trouble/danger coming, so I left. (*LDCE*, s.v. *smell*, v.2)  
b. His conduct savors strongly of hypocrisy. (*KDEC*, s.v. *savor*, v.)  
(17) Seeing is believing.

In these examples the conceptualizer uses the terms for scent and taste to make instinctive comments without obvious proofs or informational sources. On the other hand, the optical term *see* in (17) is employed to say that the sight of source thing is a sufficient proof to believe in it as a true object or entity.

Thus, the Accessibility Hierarchy based both on Shen's (1997) two factors (13) and the third factor (14) is summarized in the following table:

Accessibility Hierarchy of the Five Basic Sensory Modalities

Factors of Accessibility	Touch	Taste	Scent	Sight	Sound
Direct Contact (13a)	√	√	?	-	-
Lack of the Special Organ (13b)	√	-	-	-	-
Identification of the Source (14)	√	√	?	√	?

<Table 2>

<sup>9</sup> This is supported by the following examples in Japanese:

- (i) Hana ga kusai.  
nose NOM stink  
'It's stink (around here).'
- (ii) ... Kaze ga naorikit-tei-nai kara, kuchi ga mazui ...  
...cold NOM cure up-ASP-NEG since, mouth NOM taste bad ...  
'...something's wrong with my taste since I still have a cold...'  
(Miyuki Miyabe 1993 "Kibun wa Jisatsu Shigan (Feel Like to Commit Suicide)," *Warera ga Rinjin no Hanzai (Our Neighbors' Crimes)*, p.209, Bunsyun Bunko, Tokyo.)

Example (i), though it concerns to the language development, is a misuse by a 4-year-old native Japanese girl, where she could not find the stimulus source. Example (ii) is delivered by the main character in the mystery novel. He is a headwaiter and has a defect in his taste. Then, he cannot specify the stimulus sources.

We also have the same type of examples as (16) in Japanese:

- (iii) a. Ikanimo huru-kusai.  
indeed old-stink  
'It seems very old indeed.'  
b. Sono ken wa nandaka kono atari ga niou.  
the matter TOP somewhat this part NOM smell  
'As for the matter, this part seems somewhat suspicious.'

The table shows that the scent modality which has been treated as a lower category is not a very accessible concept.

Accordingly, we can give a better explanation for the directionality of the synaesthetic transfer, in other words, we can solve the problems in the previous studies which we have seen in (12), recited here again as (18):

- (18) a. Why is it that smell related concepts are not likely to be transferred to those of sight or sound?
- b. Why is it that the transfers from sight concepts to those of sound are preferable to transfers in the opposite direction?

For (18), on the one hand, we have pointed out that scent sensation is not so natural as the source of the synaesthetic transfer, as shown in Figure 3 which diagrams the general directionality, presenting example (8), recited here as (19):

- (19) a. \*a fragrant color
- b. ??an aromatic sound

This is because scent modality is not such an accessible and concrete concept as the previous studies have considered. Thus, the General Cognitive Constraint does not allow freely the transfer from scent to sight/sound modality as a natural mapping, since it is not clear which transfer is the one from the more accessible or basic concepts onto the less accessible or less basic ones.

On the other hand, we can explain the asymmetry between sight and sound sensory modalities in synaesthetic transfers, which have been pointed out in (9) and (10), recited here as (20) and (21):

- (20) a. a colorful sound
- b. a transparent sound
- c. a clear sound
- (21) a. ?a noisy color
- b. ?a silent color
- c. \*a shrill color

Ullmann (1951) admits that this is unexpected from his Differentiatedness Hierarchy (4) and simply states that it is because visual terminology is incomparably richer than its additional counterpart. In view of the Accessibility Hierarchy (Table 2), especially of the identifiability of the stimulus source, however, we can fairly say that the sight concept is more accessible than the sound since we can principally identify the source of visual stimuli but not always can do so of the acoustic counterpart. Therefore, the transfer from the sight to the sound concept is relatively natural but basically not *vice versa*, as in (20) and (21) above.

And also we can give an explanation for a subtle difference in acceptability between (19a) and (19b): the former may be more acceptable than the latter, if not perfectly acceptable, for some speakers. As we can see in Table 2 above, the sound sensation is less accessible than sight in comparison to scent. In this reason, we can

predict that the sense of smell is preferable to sight as a source of the transfer to sound.

It is not too far from the truth to say that the General Cognitive Constraint (5) based on the refined Accessibility Hierarchy (Table 2) can explain the general directionality of figurative transfers in synaesthetic metaphors. But actually, there are still those cases which do not accord with the directionality of Figure 3. We need to consider additional factors, cognitive and semantic ones, in order to analyze this linguistic phenomenon in detail.

#### 4.2 Co-occurrence of Stimuli

Let us take the following examples, aiming at another cognitive factor that affects the directionality of synaesthetic transfers:<sup>10</sup>

- (22) a. ?[a] hard sound (Komori 1992:62)  
 b. a delicious sound

One may judge that these expressions are unnatural. Once some suitable context is added, however, they become acceptable. For instance, we can imagine the context for (22a), as Komori (1992) mentions, such as the sound made when one strikes a frying pan, or for (22b) the sound you make when you are crunching Japanese pickles, and so forth. This drives us to consider why the phrases become acceptable in such contexts.

This is due to the way we perceive the outer world. Let us consider the following rather long quotation from Merleau-Ponty (1945):

*Synaesthetic perception is the rule, and we are unaware of it only because scientific knowledge shifts the centre of gravity of experience, ... Sight, it is said, can bring us only colours or lights, and with them forms which are the outlines of colours, and movements which are the patches of colour changing position. But how shall we place transparency or 'muddy' colours in the scale? ... The senses intercommunicate by opening on to the structure of the thing. One sees the hardness and brittleness of glass, and when, with a tinkling sound, it breaks, this sound is conveyed by the visible glass.*

(Cited from the translation, Smith 1962:229, italics mine.)

What the passage makes clear at once is that our sensory organs function separately and get each particular sensation from the entity perceived simultaneously, and then they are integrated in our perceptual field. Thus, as Merleau-Ponty (1945) truly comments, such comprehensive perceptions of synaesthesia 'exist as phenomena' and

<sup>10</sup> Oorui (1997:18) also provides the same type of Japanese example as follows:

- (i) kobasii oto  
 aromatic sound

It is quite acceptable when it describes a popcorn. One can imagine other situations for the expression.

are not even exceptional one.

Accordingly, in such cases as (22), where we can recognize easily that various sensations co-occur in perceiving the entity as the source of stimuli, we can accept those synaesthetic metaphors as natural expressions. This close observation about our sensory system, therefore, leads us to the conclusion that synaesthetic transfers depend on the co-occurrence condition of sensations we perceive as follows:

(23) Co-occurrence Condition of Sensations:

The mapping between the sensory modalities which can co-occur is preferable to that between those which cannot.

This condition predicts that a synaesthetic transfer is more natural when several sensations are recognized or are expected to co-occur physically or temporally in perceiving an entity or an event than when they not, since the interconnection between the sensations would become strong in the process of integration.

The Co-occurrence Condition (23) explains the reason why the synaesthetic transfers both between taste and touch and between taste and scent sensations are very frequent and natural. As Lehrer (1978) truly points out, the sensation of taste cannot always be clearly separated from that of touch in the mouth and the smell of the food, since 'tasting is a complex process' and 'the mouth contains nerve endings sensitive to taste and feel and the olfactory sense interacts with these' (Lehrer 1978:98). The taste concept, therefore, has a closer connection with touch and scent concepts in light of co-occurrence. Thus we have many natural transfers in synaesthetic metaphors, as follows:

(24) Touch → Taste:

- a. a harsh wine
- b. a mild cigarette

(25) Taste → Scent:

- a. a sour smell
- b. a delicious savor

The results obtained from the Co-occurrence Condition are contrary to those in previous studies, as in Taylor's (1989) analysis:

Synaesthesia involves the mapping of one sensory domain on to another ... It is doubtful whether attributes of these different domains get associated through metonymy. (Taylor 1989:139)

I cannot bring myself to accept this analysis of synaesthesia which is viewed only from a metaphorical perspective. Considering the acceptability of (22) again, we have sufficient evidence to show that we need a metonymic perspective in the synaesthetic metaphor as well. Komori (1992) also points this out as follows:

The metonymic recognition of an entity enables us to describe the stimuli it emits, not with their properties themselves, but with those of the entity and the

surroundings.

(Komori 1992:63, translation mine.)

It should be concluded, from what has been said above, that we can create natural synaesthetic metaphors in proportion to the strength of such images or the semantic content of the adjective in which two sensory concepts co-occur.

#### 4.3 Meaning Abstraction

Further matter to be considered is that there is another factor in creating natural synaesthetic metaphors in addition to the co-occurrence of the stimuli, i.e. the strong evocation of the source sensory concept. This factor involves considering why such synaesthetic transfers that are against the general tendency of directionality (such as *a loud color*) are still acceptable.

This is due to the abstraction of the meaning of source sensory modality. Taking such an example as *lily-voiced cicadas*, Tsur (1992) explains that it is unnatural because “‘lily’ is too concrete an object for intersense transfer, and its definite shape is not very likely to dissolve into a gestalt-free quality’ (Tsur 1992:249). And Tsur proposes the following two basic generalizations:

- (26) Tsur’s (1992: 253) Basic Generalizations:  
 Synaesthetic transfer is perceived as ‘smooth, natural, and genuine’,
- a. When we speak of the more differentiated sense in terms of the less differentiated sense.
  - b. When both terms of the metaphor refer to thing-free and gestalt-free qualities.

Accordingly, the example *lily-voiced cicadas* is regarded as unnatural in the light of (26b). This generalization explains that (27a), for instance, is acceptable while (27b) is not:

- (27) a. a transparent sound  
 b. \*a red sound

It follows from what has been said that this generalization, especially (26b), does not appear to accord with our co-occurrence condition above.

A close look at the concept transferred as a synaesthetic source will reveal that generalization (26b) is derived from the semantic extension of the synaesthetic adjective. In other words, a synaesthetic metaphor will become acceptable as a natural expression, when the adjective transferred from the source sensory concept has experienced some semantic bleaching and extension so as to take only an abstract or schematic meaning. Let us consider these illustrative examples:<sup>11</sup>

- (28) a. a loud sound

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<sup>11</sup> These examples in (28) are judged by Michael T. Wescoat.

- b. ? a loud color
- c. ?? a loud smell
- d. ?? a loud taste
- e. ?? a loud touch

We also have a similar series of synaesthetic metaphors in Japanese:

- (29) a. amai aji  
sweet taste
- b. amai kaori  
sweet smell
- c. ama gara  
sweet pattern
- d. amai sasayaki  
sweet whisper
- e. amai kuchizuke  
sweet kiss

(28a) is acoustic. As Tsur (1992) points out, the *loud* in (28c) and *a loud perfume* could just as well be paraphrased as *strong*, and its meaning in this use is also defined as ‘powerful, offensive, obtrusive’ in *OED* (s.v. *loud*, a.3.). We can be fairly certain that this abstraction of meaning allows the downward transfer against the general tendency of the directionality diagrammed in Figure 3. In the process of the schematization of the source sensory meaning, we come to have such expressions that the acoustic adjective no longer modifies any sensory concept but is attributed to a noun in other semantic domains, for instance, *a loud manner*, where the adjective means ‘vulgarly obtrusive, flashy’.

## 5 CONCLUSION

We have explored the synaesthetic metaphor from the cognitive perspective, focusing on especially two points: the directionality of the transfer and the creation of the metaphor.

The first important point is that we have provided a more refined explanation for the directionality of the synaesthetic transfer. Namely, following the General Cognitive Constraint, we have modified Shen’s (1997) Accessibility Hierarchy by adding the third factor, identifiability of the stimulus source, and made a better prediction for the directionality concerned with the sense of smell concept, which had been almost untouched in the previous studies.

The second point we have considered is about the creation of synaesthetic metaphors. We have confirmed, on the one hand, that not only metaphoric recognition but also a metonymic one is required in the creation of the metaphorical expressions. Thus, when we recognize the co-occurrence of various sensations, the figurative expressions become natural. At the same time, as we pointed out, the abstraction of the meaning occurs in the creation of the metaphors. That is, we have

two opposite way of creating synaesthetic metaphors and we can see a gradience in the meaning extension between the two extremes.

Our results in this paper are summarized in the following two points: a detailed cognitive account on the directionality of synaesthetic transfers, and discussion of the motivation of the creation of such transfers in view of “density” of the evoked meaning. We lack definite information on discussing how these two matters are related, and can offer only an initial comment. Figure 3 shows the general tendency for the transfers, and the co-occurrence of sensations and the abstraction of meaning are concerned with the creation of brand-new metaphors and with semantic extensions, respectively.

We have explored only English and Japanese synaesthetic metaphors. From the cognitive viewpoint, it is naturally predicted that human languages should have this kind of metaphor and that it should be explicable by the same mechanism. This issue is deeply related with so-called Sapir-Whorf Hypothesis. To argue this point, of course, would carry us too far away from the purpose of this paper.

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