

Synaesthesia and Synaesthetic Metaphors

Sean Day
107 Cochise Tr. #302
Lafayette, IN 47905
USA

daysa@omni.cc.purdue.edu

Copyright (c) Sean Day 1996

PSYCHE, 2(32), July 1996
<http://psyche.cs.monash.edu.au/v2/psyche-2-32-day.html>

KEYWORDS: synesthesia, metaphor, language, cognition, perception, senses, semiotics.

ABSTRACT: In a synesthetic metaphor, a certain perceptual mode is initially specified (or may be assumed), but the imagery is linguistically related in terms belonging to one or more differing perceptual modes. Commonplace examples of synesthetic metaphors in English include phrases such as "loud colors", "dark sounds", and "sweet smells". Tabulations of the frequency of types of synesthesia and synesthetic metaphors in English reveals that for physiological synesthesia, colored sounds are most common; in English literature, synesthetic metaphors employed for descriptions of tactile sound predominate. Of the various senses, hearing is most frequently expanded and elaborated upon by both synesthetic sensory perceptions and synesthetic metaphors. Synesthetic "visual hearing", which antedates language, may have influenced language development.

1. Introduction

Current research in neurology posits relationships between the hippocampus, the neurological condition known as synaesthesia, and the associations made in the construction of synaesthetic metaphors (see, for example, Cytowic 1993). My research addresses the following questions: Are there similarities in the sensory ranking patterns of synaesthetic associations and synaesthetic metaphors?; and, if so, What are they?

I propose that, with the information gleaned from current research in neurology, a new interpretation of synaesthesia and synaesthetic metaphors -- one which views synaesthetic metaphors as culturally and linguistically shaped, but with some neurological underpinnings -- might be obtained. This view allows for cross-linguistic studies to explore and separate the layers of semantic trends and cognitive processes, and reveals that non-linguistic methods might be used to distinguish the innate trends.

2. Theories of Metaphor

There are two paths to the history of theories pertaining to synaesthesia. The first follows from theories of metaphor, connotation, and association; the second, developed much later, employs scientific approaches to follow theories of physical, neurological disorders or/and psychosis. Many writers taking the first approach usually trace thoughts on metaphor back to early Greek rhetoric; such a history can be found, for example, in Ricoeur (1975/1977).

Perhaps one of the most persistent linguistic approaches to metaphors is what Levinson calls the "comparison theory" (Levinson 1983). The basic premise of this theory can be traced back at least to Aristotle's *Rhetoric* (1954 (c. 330 B.C.)), and variations may be found in the works of writers such as Locke (1694/1905) and Vico (1744/1961). The theory and some refutations were discussed by Peirce (see, for example, Peirce (1857-1866/1982) and more recently handled by Lakoff and Johnson (1980). The basic tenet of this approach is that "metaphors are similes with suppressed or deleted predications of similarity" (Levinson, 1983). In other words, a phrase containing a metaphor is actually a phrase containing a simile, with the predication of "like" suppressed or deleted. For example, to say "King Richard was a lion," is really to say "King Richard was like a lion".

As many writers, such as Levinson, Peirce, and in his own way, Aristotle, have indicated, the comparison theory lends itself very easily to predicate logic. Thus, according to the comparison theory, to say that "King Richard (A) was a lion (B)", is not to say "A = B", but rather to say that "A having property X is like B having property Y" (or "IS (x, y) > (SIMILAR (X(a), Y(b)))"). This is the form for what Levinson titles a nominal metaphor. Levinson (1983: 152-153) also mentions two other types of metaphor, the predicative form and the sentential form. Both of these forms, according to the comparison theory, have the basic underlying form of "A's X-ing or state of X-ness is like B's Y-ing or state of Y-ness". This should be considered in the perspective of Botscharow (1990), who claims that humans tend to "think in terms of paired opposition", as in A:B::X:Y (A is to B as X is to Y).

The comparison theory works quite well with current syntactic theories, including those most recently proposed by Chomsky (see, for example, Chomsky 1992), which may allow for the surface-level suppression/deletion of such predicates. It should also be noted that Chomsky's more recent models are (at least intended to be) universal.

The problem on the syntactic level is that the comparison model proposes that the underlying simile form with the "like" is always retrievable and that it always has the same semantic/pragmatic meaning as the form with the suppression/deletion. A sentence such as "King Richard was (like or similar to) a lion" does not pose too much of a problem: we may expand it to "The strength and/or courage of King Richard was like or similar to the strength and/or courage of a lion". But what about a sentence such as "Sally is a block of ice" (found in Levinson, 1983, taken from Searle, 1979) or (my own) "The violin gave a sour sound"? If we "expand" Searle's example, as he himself does, to "Sally

has an emotional makeup similar to the coldness of a block of ice," we do not resolve the metaphor, but rather shift it such that we must now reassess our definition of "cold(ness)". Perhaps more extreme, if we expand "The violin gave a sour sound," we can only get as far as "The violin gave a sound like or similar to the sourness of ????" (or, "The violin's sound was like a ???'s sourness"). Webster gives the following definition:

1. sour \ 'sau.(*)r\ \ 'sau.(*)r-ish\ aj [ME, fr. OE su-r; akin to OHG su-r sour, Lith suras salty] 1: causing or characterized by the basic taste sensation produced chiefly by acids 2a1: having the acid taste or smell of or as if of fermentation : TURNED {~ milk} 2a2: of or relating to fermentation 2b: smelling or tasting of decay : RANCID, ROTTEN {~ breath} 2c1: BAD, WRONG {a project gone ~} 2c2: DISENCHANTED, HOSTILE {went ~ on Marxism} 3a: UNPLEASANT, DISTASTEFUL 3b: CROSS, SULLEN 4: acid in reaction - used of soil 5a: containing malodorous sulfur compounds - used esp. of petroleum products 5b: JARRING, POOR {play a ~ note} - sour.ish aj SYN syn ACID, ACIDULOUS, TART: SOUR usu. applies to that which has lost its natural sweetness or freshness through fermentation or decay; ACID applies to what has a biting taste naturally or normally; ACIDULOUS implies a slight acidity; TART suggests a sharp but usu. agreeable acidity.

Relevant to "a sour sound," we have:

2c2: HOSTILE; 3a: UNPLEASANT, DISTASTEFUL; 3b: CROSS, SULLEN; 5b: JARRING, POOR;

all of these are capitalized in Webster to indicate that they are to be interpreted as metaphorical. Here not only are we left with the metaphor still unresolved and residing in "sour", but we are at a loss as to retrieving the underlying form. We can replace the ??? with "anything" or "a sour thing" (that is, "... like the sourness of a sour thing"), but that leaves us with the question of whether we want such a large tautological "wastebasket" term, and still leaves the metaphor unresolved.

If we cannot hold metaphors within the realms of syntax and the lexicon, can we still keep it wholly within linguistics as a semantic issue? Levinson argues that an understanding of metaphor lies beyond the realm of semantics, claiming that:

[a]n important part of the force of any metaphor thus seems to involve what might be called the 'connotational penumbra' of the expressions involved, the incidental rather than the defining characteristics of the words, and knowledge of the factual properties of the referents and hence knowledge of the world in general. All of these matters are beyond the scope of a semantic theory, as generally understood within linguistics ... (Levinson, 1983, 150pp.).

Many current theorists, wishing to keep metaphors within linguistics but outside of syntax and the comparison theory, frequently attempt to manipulate metaphors as semantic/pragmatic issues by means of Grice's maxims. Grice (1975) suggested that metaphors exploited or flouted the maxim of Quality, which may be paraphrased as 'do not say that which you believe to be false or for which you lack adequate evidence'. Levinson (1983) refutes this to indicate that metaphors, if taken literally, violate the maxim of Quality, or are conversationally inadequate in other ways, especially with regard to the maxim of Relevance (which may be paraphrased simply as 'make your statement relevant to the conversation'). In addition, Grice's suggestions are only towards

recognizing metaphors (and are vague at that) and do nothing towards explaining or interpreting metaphors.

Group *mu* (1970/1981) reasserts that all words are polysemous, thus producing overlap or redundancy between the semantics of two or more given words. Metaphors, they propose, work through the intersection of synecdochical terms, the intersection being those mutually shared (redundant) aspects. If word meanings were discrete and separate, attempts at metaphor would fall flat as "absurdities". Group *mu* claims that "metaphor is not, properly speaking, a substitution of meaning, but a modification of the semantic content of a term" (Group *mu* 1970/1981).

Marks (1978) maintains that in order for metaphors to communicate meaning there must be a shared common ground and agreement on rules. However, my question is: how remote or/and generalized can this common ground be? Moreover, does one need to agree as to the rules, or does one only need to have some form of knowledge -- perhaps not even shared, perhaps even "just made up on the spot" -- of a set (any set) of rules? Marks also seems to imply that a specific intended meaning is to be conveyed in a given metaphor, and if that meaning is not conveyed, communication has failed. I maintain that this is not the case: No two people can ever hold totally and completely the same meaning(s) of a metaphor. If a (some) workable meaning (workable in whatever manner) is created by the listener/reader such that he can then continue to make interactive responses which are (at least in part) based upon the metaphor, communication has taken place, and the metaphor has had a result, although perhaps not quite the result intended by the speaker / writer.

I feel that the linguistic aspects per se of metaphors are to be chiefly found in the realm of semantics and necessitate a re- analysis and re-working of the lexicon. However, the information and models for this re-tooling are chiefly to be found outside of linguistics proper. A key concept in attempts to understand metaphors in human language is the belief that they are not wholly random in construct but rather follow patterns and rules which may be discovered and determined.

Rules for putting two or more items (such as King Richard and a lion) together in an association are not universal, nor are the items which are listed within a classificatory set (such as "strong and courageous animals"). Rather, they vary radically from culture to culture. Thus, in order to approach the investigation of metaphors as a whole, we must first start out by breaking things up so that we may look at their specific cultures and their distinct organization and emerging rules for a particular set or type of metaphor. The field of anthropology has already supplied us with a rich collection of data on folk classification and cognitive pattern systems, ranging from such things as color terms (see, for example, Berlin and Kay, 1969; Osgood, 1959; and Osgood et al. 1975) to phytonymics (such as Friedrich, 1970; and Norrman and Haarberg, 1980) (see also Brown, 1991, Classen, 1993; Conklin, 1980; and Howes, 1991).

Connected to this is Lakoff and Johnson's (1980) concept of "metaphors we live by", which are by no means the same from culture to culture. For example, as Lakoff and

Johnson (1980) indicated, for English, "up" and "down" are high-level, vastly overarching concepts which shape other (lower-level) constructs quite rigidly but in specifically patterned ways. We have sets of contrasting phrases such as "happy is up/sad is down", "conscious is up/unconscious is down", "more is up/less is down", "good is up/bad is down", and "rational is up/emotional is down". However, while this paradigm might be quite differently structured in some other language, it is also not regularly consistent in English, either: while "happy is up is good is rational" and "unhappy is down is bad is emotional", nevertheless it is bad to have too much "levity" and better to be "down to earth". If the English-speaking Mid-Westerner's general meta-paradigm of "up" and "down" were to shift from its current model to, say, that of the Maori, literally thousands of subsumed metaphors would then need to be reformulated.

According to Lakoff and Johnson, "[t]he essence of metaphor is understanding and experiencing one kind of thing in terms of another". However, "... metaphor is not just a matter of language, that is, of mere words. ... [O]n the contrary, human *thought processes* are largely metaphorical" (emphasis in original). In other words, "[m]etaphors as linguistic expressions are possible precisely because there are metaphors in a person's conceptual system".

Regarding synaesthetic metaphors, Ullmann writes, [f]urther investigations might also reveal that the movement of synaesthetic metaphors is not haphazard but conforms to a basic pattern. I have collected data for the sources and destinations of such images in a dozen nineteenth-century poets, French, English and American, and have found three tendencies which stood out very clearly: (1) transfers from the lower to the more differentiated senses were more frequent than those in the opposite direction: over 80 per cent of a total of 2000 examples showed this 'upward' trend; (2) touch was in each case the largest single source, and (3) sound the largest recipient ... (Ullmann, 1964, pp. 86).

Ullmann's 'less differentiated' senses would be smell and taste, the 'more differentiated' hearing and sight. Both Ullmann's claims (2) and (3) bear out in my survey and tabulations; however, my research indicates a different sensory ranking than that indicated in (1).

3. Approach and Methodology

What can we posit are the patterns that synaesthetic metaphors follow? Ullmann (1964) proposed a pattern somewhat like the following:

smell/taste --> hearing/vision --> touch

which may be read as "smell/taste will evolve to being talked about in terms of hearing/vision, and likewise hearing/vision will evolve towards being talked about in terms of touch".

In 1993, Classen published a cross-cultural ethnological study of sensory ranking systems. She did not compile and tabulate instances of synaesthetic metaphors, but based her conclusions on intuition and anecdotal information. Her conclusions for the ranking system for synaesthetic metaphors in English are:

hearing --> vision --> smell --> taste --> touch.

With the insertion of "temperature" between "smell" and "taste", this ranking is the same as the order which I derive from my tabulations.

For my study, I specified six senses, none of which rely upon "multiple senses" such as motion, rest, figure, magnitude, number, or unity, as per Aristotle's "common sensibles" (Aristotle 1976 (c. 330 B.C.); see also Cytowic, 1993, and Marks, 1978). In his 1993 book, Cytowic points out that neurological synaesthesia does not involve "common sensibles", except for motion, which occurs frequently; I would also add "pain", if it were readily definable cross-culturally. In addition, I did not look at instances of "ideational" synaesthesia -- synaesthetic experiences resulting from thinking about certain things, such as colored numbers, letters, names, or days of the week. Nor do I deal with "emotional/affect" -type synaesthesia, as, for example, seeing a specific color in association with a specific person's personality.

For his study, Cytowic divided the senses into five: touch, sight, smell, taste, and hearing. This is the common British and American cultural standard. I felt it would facilitate an initial study to start with this small, traditional paradigm held by most all of the authors I would investigate, both in regards to size and ease of the investigation and to lay a foundation for the cultural "basics". However, for my research I also added a sixth sense of temperature perception, separating it from touch. These divisions are quite arbitrary and heavily reflect cultural biases; other cultures have other concepts as to what comprises a mode of perception and have other counts and divisions of those perceptions (see, for example, Howes, 1991).

Textual data was retrieved from both English printed texts and electronic texts, the latter of which came from sources including World Library's *Greatest Books Collection* (1991) CD-ROM (DOS format), the Oxford Text Archive, and Project Gutenberg. The time-range includes books from Chaucer's *Canterbury Tales*, written in 1387; Shakespeare; 19th century novelists such as Melville; and currently popular novels such as those by Michael Crichton.

As an example of how the work was carried out, let us observe the beginning pages of *Gravity's Rainbow*, by Thomas Pynchon (1973) (read and scanned in paper form). The first five synaesthetic metaphors found are as follows: "a sour smell" (p. 3); "humid green" (p. 6); "the bitter chuckles" (p. 10); "a sharp crack" (p. 25); and "a heavy explosion" (p. 25). "A sour smell" is smell in terms of taste, which I notate as "smell --> taste" (read as "smell in terms of taste" or "smell goes to taste"). "Humid green" is a color -- green, visual -- placed in terms of the tactile "humid"; thus "vision --> touch". "The bitter chuckles" are sounds put in terms of taste; thus "hearing --> taste". The next two instances, from page 25 of *Gravity's Rainbow*, both talk about sounds; "crack", here, is an onomatopoeia, and "explosion" at this point in the text describes the sound heard, rather than, say, the sight seen or the impact and shaking felt. Thus, for both, we have "hearing -> touch".

Each book I scanned has its own spread-sheet. The examples from *Gravity's Rainbow* would be recorded into its appropriate spread-sheet as follows in Table 1:

Page		
3	smell taste	--> a sour smell
6	vision touch	--> humid green
10	hearing taste	--> the bitter chuckles
25	hearing touch	--> a sharp crack
25	hearing touch	--> a heavy explosion

I then recorded these into a calculation table, as follows (Table 2):

Primary Senses	Synaesthetic Senses						
	Hearing	Vision	Smell	Temperature	Taste	Touch	Total Primes
Hearing	n/a	0	0	0	1	2	3
Vision	0	n/a	0	0	0	1	1
Smell	0	0	n/a	0	1	0	1
Temperature	0	0	0	n/a	0	0	0
Taste	0	0	0	0	n/a	0	0
Touch	0	0	0	0	0	n/a	0
Total	0	0	0	0	2	3	

The senses being talked about, or "primary senses", are listed vertically in the left-hand column; the secondary, synaesthetic senses into which the terms are placed metaphorically are listed horizontally across. Thus, for example, in the upmost right-hand corner is 'hearing in terms of touch', as in "soft music". Sums for each row and column are given, respectively, on the right-hand side for the sense talked about and on the bottom for the secondary (synaesthetic) sensory mode in which the primary sense is placed. The diagonal row of zeroes fall where a sense is talked about in terms of itself; these will always remain zero, as such phrases are not synaesthetic metaphors.

I then added all numbers in the vertical column for a particular sense and subtracted from that number the sum of the numbers across a row for that same sense. In other words, I subtracted the times a particular primary sense is talked about from the number of times that sense was used metaphorically to talk about other senses. Using this algorithm, if synaesthetic metaphors were random and evenly distributed, all of these sums would be zero across the board. As they are not, the negative/positive value indicates the weighing of a sense in a 'ranking' sequence. The senses were placed in order from greatest positive value to greatest negative value, which reflects the sequence of least marked sense to most marked sense. Table 3 reflects this ranking for the five sample examples from *Gravity's Rainbow*:

Table 3: Ranking of Five Sample Examples From *Gravity's Rainbow* by Thomas Pynchon (1973)

	Secondary - Primary	Ranking
Touch	(3 - 0)	3
Taste	(2 - 0)	2
Temperature	(0 - 0)	0
Smell	(0 - 1)	-1
Vision	(0 - 1)	-1
Hearing	(0 - 3)	-3

In a similar fashion, I took the details from Cytowic's accounts of his subjects (Cytowic, 1989) and tabulated them (Tables 4 through 6).

Table 4: The Synaesthesia Displayed by Cytowic's (1989) Synaesthetes

Name		Name	
CSc	hearing --> taste	DH	hearing --> vision

	hearing --> smell		
DS	hearing --> vision touch --> vision	DSc	hearing --> vision
DSh	hearing --> vision	EW	hearing --> vision
EWe	hearing --> vision	FKD	hearing --> vision
GG	hearing --> vision	GH	hearing --> vision
LF	hearing --> vision	JM	hearing --> vision
MG	vision --> smell	MLL	hearing --> vision
MM	hearing --> vision	MMo	hearing --> taste hearing --> vision vision --> touch
MN	hearing --> vision hearing --> touch		
MW	taste --> touch taste --> temperature smell --> touch smell --> temperature		
PP	hearing --> vision	RB	hearing --> touch
RP	hearing --> vision taste --> vision touch --> vision	SO	hearing --> vision
TP	hearing --> vision	VE	hearing --> vision
WW	hearing --> vision		

Table 5: Tabulation of Cytowic's (1989) Synaesthetes

Primary Senses	Synaesthetic Senses						Total Primes
	Hearing	Taste	Smell	Temperature	Touch	Vision	
Hearing	n/a	2	1	0	2	21	26
Taste	0	n/a	0	1	1	1	3
Smell	0	0	n/a	1	1	0	2
Temperature	0	0	0	n/a	0	0	0

Hearing	n/a	80	1	86	149	540	856
Vision	26	n/a	1	42	38	135	242
Smell	7	14	n/a	3	60	34	118
Temperature	0	4	0	n/a	19	8	31
Taste	0	0	0	1	n/a	6	7
Touch	3	2	0	0	10	n/a	15
Total	33	100	2	132	276	723	

The ranking for this data is as per Table 8:

Table 8: Ranking for the Complete Data of Synaesthetic Metaphors in English

	Secondary minus Primary	Ranking
Touch	723 - 15	708
Taste	276 - 7	269
Temperature	132 - 31	101
Smell	2 - 118	-116
Vision	100 - 242	-142
Hearing	36 - 856	-820

The percentages for the total data of synaesthetic metaphors in English is as follows in Table 9:

Table 9: Rates of Occurance for Synaesthetic Metaphors in Various English Texts

Type of Metaphor	Rate (%)
hearing-->touch	42.6%
hearing-->taste	11.7%
vision-->touch	10.6%

hearing-->temperature	6.8%
hearing-->vision	6.3%
smell-->taste	4.7%
vision-->temperature	3.3%
vision-->taste	3.0%
smell-->touch	2.7%
vision-->hearing	2.0%
temperature-->taste	1.5%
smell-->vision	1.1%
touch-->taste	0.8%
smell-->hearing	0.6%
temperature-->touch	0.6%
taste-->touch	0.5%
temperature-->vision	0.3%
smell-->temperature	0.2%
touch-->hearing	0.2%
touch-->vision	0.2%
hearing-->smell	0.1%
taste-->temperature	0.1%
vision-->smell	0.1%
Total	100.0%

For neurological synaesthesia, colored sounds are highly common (colored letters and numbers are most common). For synaesthetic metaphors in English, on the other hand, tactile sounds are most common. However, note that both realms focus heavily on translating auditory sensations.

Hearing outstrips the other senses as the most common for which to attach metaphors; touch is the most common sense things are expressed in. In other words, the most common general synaesthetic metaphors are along the lines of 'hearing --> touch'; that is, for example, a "harsh sound" or a "soft word".

Contrarily, then, the least likely, should be 'touch --> hearing'. However, this is not the case. As Classen points out (Classen 1993), the sense of smell and words to describe smell are disproportionately under-represented in the English language. Whereas in my tabulations 36 instances were put in terms of hearing, which "should" be the least common, only 2 out of 1,269 were put in terms of smell.

Perhaps more interesting, certain pairings did not occur at all in the data compiled so far. Those pairing which have not yet been seen in 1,269 instances of synaesthetic metaphors are:

- temperature --> hearing
- temperature --> smell
- taste --> hearing
- taste --> vision
- taste --> smell
- touch --> smell
- touch --> temperature

Note once again how other senses in terms of smell are extremely rare. Part of the reason for the scant use of "smell" words synaesthetically is the paucity of terms for various types of smells in English and the general trend to describe smells in terms of objects, or, as Table 7 indicates, tastes. In turn, this reflects the interconnection of taste and smell or, to put it another way, the role of smell in perceiving tastes and our tendency to conceive of a "flavor" in terms of the combined aspects of taste, touch, and smell (and perhaps also temperature; there has been some argument that vision and hearing also play major roles in the concept of taste, such as in audibly crunchy foods or the avoidance of blue foods).

Taste is the least common sense placed into a synaesthetic metaphor, less common than temperature or touch.

Percentage-wise, hearing in terms of some other sense accounts for four out of the top five most common forms of synaesthetic metaphors in English. Furthermore, hearing in terms of touch is almost four times as common as the next most common form, accounting for 42.6% of all instances of synaesthetic metaphors in English.

5. Synaesthetic Metaphors in German

This current work's purpose is to provide a basis of information regarding synaesthetic metaphors in English towards comparisons with bodies of information on synaesthetic metaphors in other languages. By cross-linguistic examinations, we may shed light on the degrees to which certain types of synaesthetic metaphors are culturally or neurologically influenced. The data from English gives us some ideas as to what to look for and what to compare, but without comparative material we do not really know the extents to which the English data meet universal norms or are, to greater or lesser parts, flukes!

I compiled all of the synaesthetic metaphors in Thomas Mann's *Buddenbrooks* (1922), read in the original German. Tabulating this data, I obtain the following (Table 10):

Table 10: Tabulation of the Synaesthetic Metaphors in *Buddenbrooks* by Thomas Mann (1922)

Primary Senses	Synaesthetic Senses						
	Hearing	Smell	Vision	Temperature	Taste	Touch	Total Primes
Hearing	n/a	0	12	14	9	117	152
Smell	0	n/a	0	1	4	7	12
Vision	3	0	n/a	0	2	3	8
Temperature	0	1	0	n/a	0	2	3
Taste	0	0	0	1	n/a	0	1
Touch	0	0	1	0	0	n/a	1
Total	3	1	13	15	15	127	

Putting this through the ranking algorithm, I obtain the following as seen in Table 11:

Table 11: Ranking for the Synaesthetic Metaphors in *Buddenbrooks* by Thomas Mann (1922)

	Secondary minus Primary	Ranking
Touch	129 - 1	128
Taste	15 - 1	14
Temperature	16 - 3	13
Vision	13 - 8	5
Smell	1 - 12	-11
Hearing	3 - 152	-149

Percentage-wise, I obtain the following results as seen in Table 12:

Table 12: Rates of Occurance for Synaesthetic Metaphors in *Buddenbrooks* by Thomas Mann (1922)

Type of Metaphor	Rate (%)
hearing-->touch	66.1%
hearing-->temperature	7.9%
hearing-->vision	6.8%
hearing-->taste	5.1%
smell-->touch	4.0%
smell-->taste	2.3%
vision-->touch	1.7%
vision-->hearing	1.7%
vision-->taste	1.1%
temperature-->touch	1.1%
smell-->temperature	0.6%
taste-->temperature	0.6%
temperature-->smell	0.6%
touch-->vision	0.6%
Total	100.0%

Although the German data here is all extracted from a single author's one book, I feel that 177 data are a sufficient sample number to make some initial comments upon. As Table 11 indicates, the sensory ranking is slightly different for German of the first half of the twentieth century, taking the order hearing -> smell -> vision -> temp. -> taste -> touch as opposed to English's general hearing -> vision -> smell -> temp. -> taste -> touch; the order of vision and smell are switched around in German.

The German data's weighing towards 'hearing --> touch' is far heavier than that of English: 66.1% for German, as opposed to 42.6% for English (see Table 9). To put that another way, the 752 pages of text of Mann's *Buddenbrooks* averaged one synaesthetic metaphor per every 4.25 pages, and, of those synaesthetic metaphors, two thirds were hearing in terms of touch.

The German data lends support to the ranking system derived for synaesthetic metaphors in English, reaffirms the heavy weighing of the 'hearing --> touch' tendency, and suggests that, at least for Germanic languages, and possibly for a fair share of Indo-European languages, the English/German model of synaesthetic metaphor ranking will hold cross-linguistically. The cause of general Indo-European trends in synaesthetic metaphors may be physiological, cultural, or both; however, establishing specifically what the trends are will help in dissolving the theory that synaesthetic metaphor constructions and rankings are totally random and arbitrary, and aid in establishing a base which may then be examined for cultural and physiological inputs.

6. Conclusions

Group *mu* (1970/1981) maintains that certain lexemes, such as color terms, are not very polysemous nor can they be reduced much. According to Group *mu*, to say "the sky is blue like an orange" is quite extreme (see Group *mu* 1970/1981). However, what of the synaesthete who says, for example, "An orange tastes sky-blue"? Is this a rhetorical error? What (semantic) meaning does "blue" carry here? Perhaps the more essential question is, what (extended) meaning does "taste" have?

Marks concluded that:

"[m]etaphoric expressions of the unity of the senses evolved in part from fundamental synesthetic relationships but owe their creative impulse to the mind's ability to transcend these intrinsic correspondences and forge new multisensory meanings. Intrinsic, synesthetic relations express the correspondences that are, extrinsic relations assert the correspondences that can be." (Marks, 1978, pp. 103)

We can say, without need for apprehension, that synaesthetic metaphors are indeed metaphors. Moreover, they can work just like most other metaphors (however that actually is!). The problem is, how easily can we say that they are derived in the same manner? For if they are not derived like other metaphors but have a type or extension/variation of truth behind them, do they come to have meaning via the same semantic processes as other metaphors?

The meanings for synaesthetic metaphors are not simply there, hard-wired and innate, but are generated through semantic processes and fashioned by time and cultural elements, much like other metaphors. The trends and universals of synaesthetic metaphors are built and evolve in the same manner as for other metaphors, through linguistic and cultural processes; and these trends and universals can be investigated from a linguistic standpoint. By comparative investigation of synaesthetic metaphors on a much larger scale, heading (granted, slowly) towards global, the chart of synaesthesia might become better defined: any hard-wired synaesthetic associations might be in low percentage globally, but they should appear world-wide regardless of culture or/and language group; metaphors qua metaphors, linguistically produced via semantic rules, will appear in pockets, and the associations should vary from culture to culture.

While there is not total congruency between synaesthesia and synaesthetic metaphors, they do overlap significantly in their focus on hearing. However, they also diverge significantly: synaesthetes predominantly perceive their synesthesiae visually; English and German language users heavily use touch for the secondary perception. Synaesthetic metaphors are both to some extent neurologic and to some extent the logical default conclusions of the physical world around us and the logical imperatives of human biology as a whole.

The next step in investigation is to look at synaesthetic metaphors in other languages and cultures: uniformity in patterns across languages might indicate a more biological basis, while divergence would indicate the degree to which low-level, random synaesthesia is mediated by culture. Research is currently underway in Irish and Japanese.

References

Aristotle. (1976 (c. 330 B.C.)). *De anima* (R. D. Hicks, Trans.). New York: Arno.

Aristotle. (1954 (c. 330 B.C.)). *Rhetoric* (W. R. Roberts, Trans.); *Poetics* (I. Bywater, Trans.). New York: Modern Library.

Berlin, B., & Kay, P. (1969). *Basic color terms: their universality and evolution*. Berkeley and Los Angeles: University of California Press.

Botscharow, L. J. (1990). Paleolithic semiotics: behavioral analogs to speech. In M. L. Foster, & L. J. Botscharow, (Eds.), *The life of symbols* (pp. 63-79). Boulder and Oxford: Westview.

Brown, D. (1991). *Human universals*. New York: McGraw-Hill.

Chomsky, N. (1992). A minimalist program for linguistic theory. *MIT Occasional Papers in Linguistics Number 1*. Cambridge, Massachusetts: MIT Working Papers in Linguistics.

Classen, C. (1993). *Worlds of sense*. London and New York: Routledge.

Conklin, H. C. (1980). *Folk classification: a topically arranged bibliography of contemporary and background references through 1971*. Revised reprinting with author index. New Haven, Connecticut: Yale University Press.

Cytowic, R. E. (1993). *The man who tasted shapes*. New York: Putnam.

Cytowic, R. E. (1989). *Synaesthesia: a union of the senses*. New York: Springer-Verlag.

Friedrich, P. (1970). *Proto-Indo-European trees*. Chicago and London: University of Chicago Press.

Grice, H. P. (1975). Logic and conversation. In Cole, & Morgan, (Eds.), *Syntax and semantics 3: speech acts* (pp. 41-58). New York: Academic Press.

Group *mu* (Dubois, J., Edeline, F., Klinkenberg, J-M., Minguet, P., Pire, F., & Trinon, H.). (1981). *A general rhetoric* (P. B. Burrell, & E. M. Slotkin, Trans.). Baltimore and London: The John Hopkins University Press. (Translation of *Rhitorique ginirale*; original work published 1970.)

Howes, D., (Ed.). (1991). *The varieties of sensory experience: a sourcebook in the anthropology of the senses*. Toronto and London: University of Toronto Press.

Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago and London: University of Chicago Press.

Levinson, S. C. (1983). *Pragmatics*. Cambridge: Cambridge University Press.

Locke, J. (1905/1694). *Locke's essay concerning human understanding*. Books II and IV. M. W. Calkins, (Ed.). La Salle, Illinois: Open Court. (Original work published in 1694.)

Mann, T. (1922). *Buddenbrooks*. Stuttgart: Deutschen B|cherbund GmbH & Co.

Marks, L. E. (1978). *The unity of the senses*. New York and London: Academic Press.

Norrman, R., & Haarberg, J. (1980). *Nature and language: a semiotic study of cucurbits in literature*. London and Henley: Routledge and Kegan Paul.

Osgood, C. E. (1959). The cross-cultural generality of visual-verbal synesthetic tendencies. *Behavioral Science*, 5, 146-169.

Osgood, C. E., May, W. H., & Miron, M. S. (1975). *Cross-cultural universals of affective meaning*. Urbana and London: University of Illinois Press.

Peirce, C. S. (1982). *Writings of Charles S. Peirce; a chronological edition*. Volume I, 1857-1866. M. H. Fisch, (Ed.). Bloomington: Indiana University Press. (Original works published 1857-1866.)

Pynchon, T. (1973). *Gravity's rainbow*. New York: Viking.

Ricoeur, P. (1977). *The rule of metaphor*. Czerny, R., McLaughlin, K., & Costello, J., (Trans.). Toronto and London: University of Toronto Press. (Translation of *La mitaphore vive*; original work published 1975.)

Searle, J. R. (1979). Metaphor. In Ortony, A., (Ed.), *Metaphor and thought* (pp. 92-123). Cambridge: Cambridge University Press.

Ullmann, S. (1964). *Language and style*. Oxford: Basil Blackwell.

Vico, G. (1961). *The new science*. Bergin, T. G., & Fisch, M. H. (Trans.). Ithaca and London: Cornell University Press. (Translation of *Scienza nuova*; original work published 1744.)

World Library. (1991). World Library's greatest books collection. CD- ROM; DOS format. Garden Grove, California: World Library.