

Synaesthesia

Language, Thought, Cognition and Culture

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OUTLINE OF THE TALK

- Preface: **Lexicalized Senses: Language, and Cognition**
- Synaesthesia: An Introduction
- Research Questions
 - Neuro-Cognitive
 - Metaphor Theory
 - Linguistics: including levels of linguistics and ontology of language
 - Lexical Semantics: including directionality and cultural influences
 - Computational Linguistics
- Linguistic Synaesthesia: Language, Cognition, and Culture
 - Chinese Characters
 - Directionality: Embodiment or Telic
 - Classical Chinese (The translated Buddhist texts)
 - 味
- Conclusions

Sense, Language, Cognition

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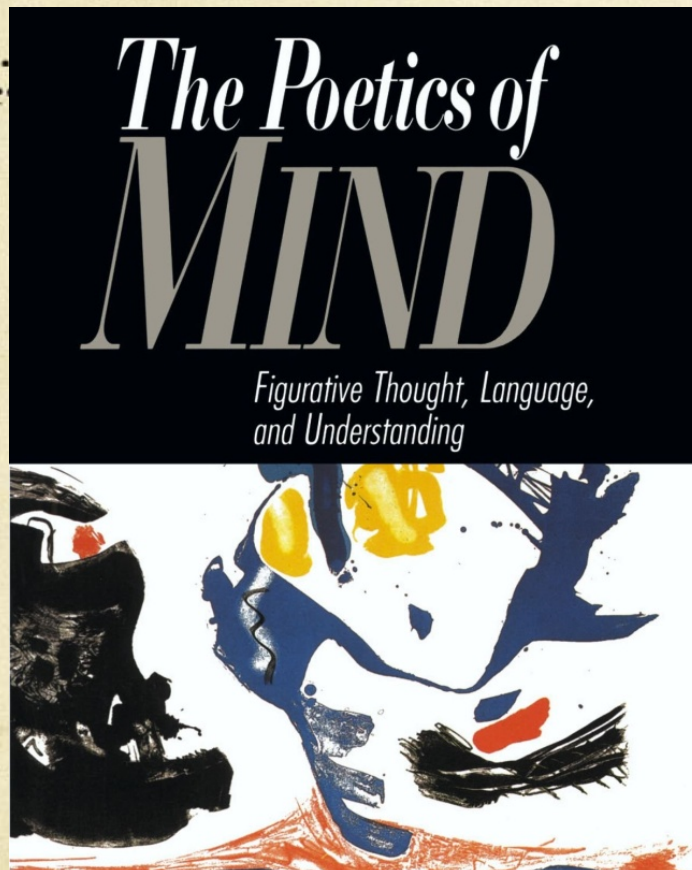
匂いへ/嗅ぐ

鼻

汪維輝, 秋谷裕幸 (2014) 漢語「聞 / 嗅」義詞的現狀與歷史. *Language and Linguistics* 15(5) 699–732

Synaesthesia: An introduction

- ✎ Etymologically, the term “synaesthesia” consists of two morphemes (from Greek):
 - *syn*: joined; together
 - *aesthesia*: perception or sensation
- ✎ *synaesthesia*: the union of senses
- Synaesthesia is well known in neuro-cognitive science
 - the man who tasted shapes (Cytowic 1993)
 - And opens a window for studying brain localization and embodiment theory of brain mapping
- ✎ In literary and metaphor studies synaesthesia is one instance of metaphoric transfer, i.e., the transfer of information from one sensory modality to another.



Raymond W. Gibbs, Jr.



The Man Who Tasted Shapes
Richard E. Cytowic, M.D.

Past/Recent Studies

- Poetics: Schrader (1969) and Linguistics Ullmann (1957), Williams (1976):
 - Reported directionality of synaesthetic metaphorical transfers, i.e., they tend to go from the lower toward the higher senses (Rosiello 1963 for Italian; Dombi 1974 for Hungarian; Yu 2003 for Mandarin; and Lien 1994 for Southern Min)
 - Within the cognitive linguistics paradigm this tendency has been interpreted as an instance of a directionality principle that applies to metaphors in general (Shen & Cohen 1998, Shen & Aisenman 2008).
 - Recently corpus-based studies of synaesthesia (Day 1996, Ronga *et al.* 2012, and Marotta 2012).

Neuro-Cognitive Studies

- Genuine perceptual phenomenon
 - should not be recognized as ‘a neural disorder’ (Cytowic, 1993; Ramachandran and Hubbard, 2001 etc.)
- May result from the hyperconnectivity or cross-activation between brain regions (Hubbard and Ramachandran 2005)
- Today, when the reality of synaesthesia is accepted, we can explore positively the phenomenon’s physiological connection with sense-related metaphorical associations’ (Ramachandran and Hubbard 2003)

Linguistic Synaesthesia

- A linguistic device by which a perceptual experience related to one sense is described through lexical means typically associated with a different sense (e.g. ‘sweet voices’, ‘sharp tongues’).
 - We use it everyday!
 - Is it only ‘sense-related metaphorical association’?
- Synaesthesia can be considered as an instance of semantic incongruence.

Synaesthesia in Chinese characters

- The combination of radicals reveal one of the six senses.
 - 美 ‘tasty; beautiful’ = 羊 ‘sheep’ + 大 ‘big’
 - 鮮 ‘tasty’ = 魚 ‘fish’ + 羊 ‘sheep’
 - 尖 ‘pointed’ = 小 ‘small’ + 大 ‘big’
- The information encoded by the combination of radicals may be culture-bound.

Research questions

- The Ultimate Scientific Question

How to predict/verify functional mapping of brain location?

Embodiment Theory vs. Cartesian Dualism

- The current research questions: Is synaesthesia
 - A kind of metaphor (and predicted by embodiment principle)?
 - Is directionality constraints on synaesthetic mapping universal (or culturally bound)?

Synaesthesia and Neuro-Cognitive Processing

- Types of cross-domain synaesthesia include some that do not directly rely on verifiable sensory experience (e.g. Banissy et al. 2014, Marks and Mulvenna 2013).
- Is conceptual knowledge the foundation of synaesthesia? (e.g. Chiou and Rich 2014).
 - the effect of linguistic or lexical-conceptual knowledge on perception (e.g. Brewer et al. 2014 on gustatory-olfactory perception),
 - the effect of lexical and semantic processing on synaesthesia (references cited in Chiou and Rich 2014).
- Is there neuro-cognitive basis for (all) linguistic synaesthesia?

Directionality in Synaesthesia in Modern Chinese: Embodiment?

○ Tactile

○ 痛 'pain'

○ 重 'heavy'

○ 輕 'light'

○ 熱 'hot'

○ 暖 'warm'

○ 冷 'cold'

○ 嫩 'tender'

○ 滑 'smooth'

○ 麻 'numb'

○ 淡 'light'

auditory

visual

gustatory

- It seems that the tactile domain is an active source sensory domain to be mapped to auditory, visual and gustatory domains.

Directionality in Synaesthesia in Modern Chinese: Embodiment?

- **Auditory:**
 - 高聲 'high-sound' (visual-to-auditory)
 - 大聲 'big-sound' (visual-to-auditory)
 - 高音 'high-sound' (visual-to-auditory)
 - 重音 'heavy-sound; stress' (tactile-to-auditory)
 - 声音洪亮 'sound-bright; loudness' (visual-to-auditory)
 - 輕聲 'light-sound' (tactile-to-auditory)
 - 輕言細語 'light-speech-thin-speech; soft speech' (tactile-to-auditory)
 - 重話 'heavy-speech; blunt words' (tactile-to-auditory)
- Auditory sense is most likely to be the target domain, which is modified by epithets from other sensory domains, such as visual and tactile domains.
- It seems that those sounds modified by tactile epithets tend to develop into metaphoric meanings.
- (Regarding the differences between 聲 'sound' and 音 'sound', please refer to 洪嘉麒, 黃居仁 2004)

Gustatory to Touch: Embodiment?

○ 苦 *kǔ*_[TASTE/SOURCE] 寒 *hán*_[TOUCH/TARGET]

‘bitter cold’

○ 覺得 *jué-de* 鼻子 *bí-zi*_[TOUCH/TARGET] 一 *yī* ASP

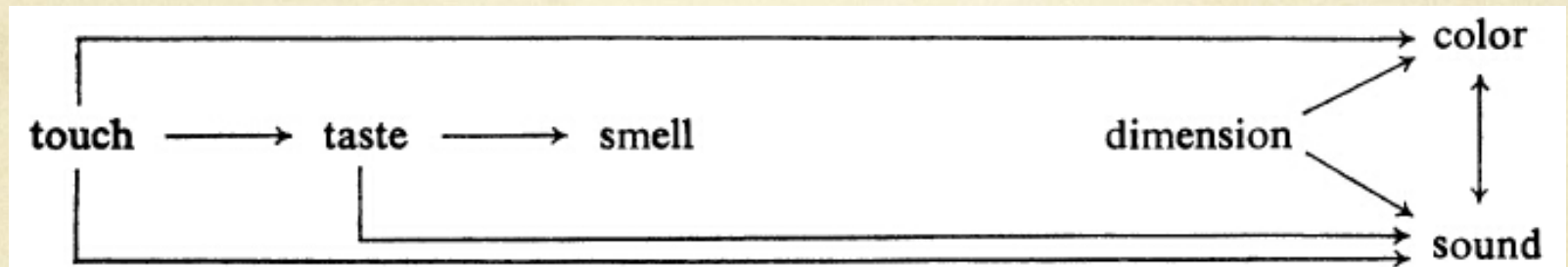
酸 *suān*_[TASTE/SOURCE]

‘feeling sore in the nose’

(Zhao and Huang in preparation)

Is the cognitive hierarchy universal?


- **Hierarchy:** Adjective: universal directionality for meaning change, based on dictionaries (Williams 1976)



The synaesthetic hierarchy of gustatory adjectives


○ Mandarin

TASTE → SMELL → VISION → HEARING



○ English

TASTE → SMELL → HEARING → VISION



(Zhao and Huang in preparation)

English Taste to Hearing Adjectives

- lovely sweet_[TASTE/SOURCE] voice_[HEARING/TARGET]
- the dulcet_[TASTE/SOURCE] tones_[HEARING/TARGET] of a group of children
- mellow_[TASTE/SOURCE] tone_[HEARING/TARGET] of his voice
- at her tart_[TASTE/SOURCE] tone_[HEARING/TARGET]
- sour_[TASTE/SOURCE] note_[HEARING/TARGET]

(Zhao and Huang in preparation)

Chinese Taste to Vision Adjectives

- 甜 tián_[TASTE/SOURCE] 白 bái_[VISION/TARGET] ‘the sweet-white color’
- 甜美 tián-měi_[TASTE/SOURCE] 的 de 笑容 xiào-róng_[VISION/TARGET] ‘the sweet smile’
- 鮮 xiān_[TASTE/SOURCE] 黃色 huáng-sè_[VISION/TARGET] ‘the bright yellow’
- 苦 kǔ_[TASTE/SOURCE] 著 zhe 臉 liǎn_[VISION/TARGET] ‘with bitter facial expressions’
- 辣 là_[TASTE/SOURCE] 死 sǐ 人 rén 的 de 身材 shēn-cái_[VISION/TARGET]
hot (in taste) dead human NOM body-material
‘the sexy body figure’

(Zhao and Huang in preparation)

CL/NLP

- Can Synaesthesia be automatically extracted? (Strik Lievers and Huang 2016, Liu, Huang, and Strik Lievers 2015)
- What additional information (e.g. sentiment, stance, implicatures) can be inferred when synaesthesia occur in text.
- Sense Lexicon + Syntactic Construction based
- Presence of two senses in the same context

Culture-bound synaesthesia

- Linguistic synaesthesia exhibits cross-cultural differences.
 - e.g., 尖 in Chinese versus *sharp* in English
- A case study:
 - *Being Assiduous, Do We Have BITTERNESS OR PAIN?* (Xiong and Huang, 2015)

Culture-bound synaesthesia

Table 1
***Ku* ‘bitterness; bitter’ and its synaesthesia**

gustatory	olfactory	auditory- mental	mental
<i>ku-cha</i> ‘bitter-tea’, <i>ku-wei</i> ‘bitter- taste’	<i>ku-wei</i> ‘bitter- smell’	<i>ku-yan</i> ‘bitter- words; unpleasant words’	<i>ku-men</i> ‘bitter- stuffy; depressed’, <i>ku-zhong- zuo-le</i> ‘bitter-in- do- happiness; enjoy in the mist of sorrow’
negative	negative	negative	negative

Culture-bound synaesthesia

Table 2
***Tong* ‘pain; painful’ and its synaesthesia**

tactile	mental
<i>ya-tong</i> ‘teeth-pain’	<i>tong-xin</i> ‘pain-heart; distressed’
negative	negative

Culture-bound synaesthesia

Table 3
Bitterness and its synaesthesia

gustatory	auditory- mental	tactile- mental	mental
<i>bitter lemon</i>	<i>bitter words</i> (sarcastic or unpleasant words)	<i>bitter blow; bitterly cold</i>	<i>bitter memory, bitter experience</i>
negative	negative	negative	negative

Culture-bound synaesthesia

Table 4
Pain and its synaesthesia

tactile	mental
<i>back pain</i>	<i>pain of defeat, pain of imprisonment, the pain of loneliness</i>
negative	negative

Culture-bound synaesthesia

(10) The conceptual metaphor of *ku* ‘bitterness; bitter’:

* **EFFORT IS BITTERNESS.**

(11) The conceptual metaphor of *tong* ‘pain; painful’:

* **INTENSITY IS PAIN.**

Culture-bound synaesthesia

(12) bitter campaign/argument/opposition/dispute

(13) bitter resentment

(14) bitterly fight/attack/argue

- * When *bitter* or *bitterly* is applied, the modified action is intensified.

Culture-bound synaesthesia

(15) No pain, no gain!

(16) Successful are those who are willing to take pains.

(17) We must take pains to do meticulous work among the masses.

(18) They take pains over writing and send them here for us to read.

(19) I had taken great pains with my appearance.

(20) If you want to succeed in the work, you must take pains about it.

(21) They take pains to hire people whose personalities predispose them to serve customers well.

Pain in English seems to be able to encode “effort making”

Culture-bound synaesthesia

(22) The conceptual metaphor of *bitter*:

* INTENSITY IS BITTERNESS.

(23) The conceptual metaphor of *pain*:

* EFFORT IS PAIN.

Culture-bound synaesthesia

Table 5
The conceptual metaphors of BITTERNESS and PAIN

	BITTERNESS	PAIN
Chinese	EFFORT	INTENSITY (negative)
English	INTENSITY (negative)	EFFORT

Synaesthesia in Chinese Buddhist Texts

- Motivations:
 - The theory of the six senses is one of the core teachings in Buddhism. Therefore, we expect to find rich literature revolving around the six senses, which is verified in our study.
 - The Chinese Buddhist texts feature a wide range of time depending on when they were translated. This provides us a platform to investigate how sensory words may diachronically differ in terms of their synaesthetic uses.

The Buddhist View of the Six Senses 六識

Six internal sense spheres	Contact	Six external sense spheres		
		Sense objects	Dimensions	Qualifying terms
the eye	look at; see	the forms	color; shape; size; space	bright, dull, round, straight, big, small, full, empty...
the ear	listen to; hear	the sounds	uni-dimensional	loud, quiet, melodious, jarring, pleasant-to-the-ear, ear-piercing...
the nose	smell	the smells	uni-dimensional	fragrant, aromatic, perfumed, smelly, odorous...
the tongue	taste	the tastes	uni-dimensional	yummy, tasty, delicious, savory, unsavory, insipid...
the body	feel	the tangibles	solidity, fluidity, heat, mobility	hard, soft, fluid, watery, hot, cold, fast, slow...
the mind	perceive; think	the ideas; the emotions	abstract (positive, negative, neutral)	happy, sad, clam, tranquil, equanimous... 31

Gustatory 味

味 ‘taste’ (gustatory word; noun)

我眼見色，我耳聞聲，我鼻嗅香，我舌嘗味，我身覺觸，我意識法。[雜阿含經]

- My eyes see colors, my ears hear sounds, my nose smells fragrance, my tongue tastes tastes, my mind senses the law
-Saṃyukta Āgama
- 味 is originally gustatory in meaning.
- 味 seems to be fundamental/basic across all the sensory domains, as it is compatible with all the other sensory words.

味： synaesthesia and metaphor

- Our findings:
 - When 味 is used to modify another sensory word (including the gustatory word 味 itself), it is synesthetically connected to the mental domain to refer to gratification, desire and craving.
 - This usage may embody GUSTATORY-TO-MENTAL transfer, which is synesthetic.
 - When 味 is used to modify a non-sensory word, as in 解脫味 and 法味, it refers to the meaning of “nature”.
 - This is a metaphorical usage, which can be expressed as TASTE IS NATURE.

味： synaesthesia and metaphor

- Our findings:
 - The use of 味 in Chinese coincides with the use of ‘taste’ in English, though Chinese and English versions were translated separately. We thus conclude that the synaesthetic and metaphoric uses of TASTE originates in **Pali texts**.
 - The gustatory domain might be so basic that it is compatible with all the rest of the sensory domains, as evidenced by the umbrella term of 味 in elaborating on all the other sensory domains in Buddhist suttas.

Auditory word 聞

- 聞 ‘to listen to, to hear’, as the character indicates, is auditory in meaning.
- 如是我聞 ‘Thus have I heard’, was believed to be used to start each and every sutta when Ven. Ananda (阿難比丘) recited the suttas from memory, in the First Buddhist Council.
- 聞 is attested to refer to the olfactory action of ‘smell’, as below:
 - 以是清淨鼻根，聞於三千大千世界上下內外種種諸香。
 - 象香、馬香、牛羊等香，男香、女香、童子香、童女香，及草木叢林香——若近、若遠、所有諸香，悉皆得聞，分別不錯
 - Auditory-to-olfactory

CONCLUSIONS 如是我聞

- In the Chinese language, synaesthesia can be embodied in at least three levels, i.e., sub-lexical level (characters), lexical levels (words) and syntactic levels (SV or VO). The former two are much more dominant than the third one.
- Synaesthesia may play a role in the diachronic development of lexical changes (e.g., 聞).
- Synaesthesia-related sense domains could be conceptually equal in the sense that not one domain can be said to be more embodied or abstract than the other, as in the case of 麻 (both tactile and gustatory). This feature makes synaesthesia qualitatively different from conceptual metaphor.

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