

Pleasing to the Mouth or Pleasant Personality: A corpus-based study of conceptualization of desserts in online Chinese food reviews

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Abstract

Description of flavours of desserts often involves a rich range of vocabulary. This paper investigates the real-life language describing tastes of desserts in Mandarin Chinese, extracting data from *Dazhong Dianping*, the most popular restaurant review website in China. Using the *Sketch Engine* as the primary tool to extract collocations, we found that ‘mouthfeel’ and ‘personality’, instead of direct descriptions of TASTE or SMELL, are the most dominant expressions. In particular, more than one hundred ‘mouthfeel’ words are identified, with strong tendency of positive polarity. The majority of ‘mouthfeel’ terms are tactile (sense of touch) in nature, which shall be considered as synaesthetic metaphors to depict TASTE. Moreover, these ‘mouthfeel’ words often collocate with words connoting pleasant personality, especially in terms of warm social interactions. In summary, due to its intensional rather than physical telicity, description of desserts shows significant cultural variations. On the one hand, the preferred words still retain the same telic purpose, i.e., to please the mouth; on the other hand, instead of using expressions conveying intensional bodily pleasure (sensuality/sexuality), Chinese focus both on the parochial bodily experience (pleasing the mouth) as well as the social-interactive (pleasant personality) to describe desserts.

1 Introduction

Bite into a Snicker (a chocolate bar), how do you describe its feeling in your mouth? Mmmm, thick and gooey with the caramel syrup, crunchy peanuts, with the chocolate melting in your oral cavity, sweet, creamy, smooth and slightly bitter chocolate richness, with the aroma wafting up into your nasal cavity. When it is all consumed, you are surely

pleased and satisfied. Tasting is a complicated process which could not be separated from gustatory (taste), olfactory (smell), and tactile (touch) senses. Vision and hearing are also involved in a way, and on top of that, emotions. Researchers named this multisensory experience ‘flavour perception’ and studied it mainly from neurophysiological and psychological perspectives (see, e.g. Small, 2012; Spence, 2017). Although Chinese people probably believe that they are most knowledgeable when it comes to tasting food and drinks, as exemplified by a famous Chinese saying 「民以食為天」 (Food is Heaven), few attempts have been made to investigate the relationship between the multisensory flavour perception and their language used to describe this experience. This paper will focus on discussing how Chinese people talk about their feelings when they taste desserts which are not part of Chinese food culture. It attempts to add to the existing literature on the interrelationship among different sensory modalities and shed more light on the relationship between language, perception and cognition.

1.1 The meaning of 味 *wèi* ‘taste’

When we try to identify descriptions for desserts in Chinese, we start with this question: 這個甜品的味道如何? (*Zhège tiánpǐn de wèidào rúhé?* ‘How is the taste of this dessert?’) Therefore, before we go further, the first concept that calls for clarification is the meaning of 味 / 味道 (*wèi/wèidào*) in Mandarin Chinese.

The original meaning of 味 *wèi* is elaborated as 滋味 *zīwèi* in *ShuoWenJieZi* in *Handian*¹, and the following sentence extracted from *Lüshi Chunqiu*²

¹ Accessed at <http://www.zdic.net/>

² Also known as “The [Spring and Autumn] Annals of Lü Buwei”. It is an encyclopaedic Chinese classic text and a

best explains what 滋味 *zīwèi* means to Chinese people: 「若人之於滋味，無不說甘脆，而甘脆未必受也。」 (“It is like the case of the human attraction for rich flavours. Everyone likes what is sweet and crisp, but that does not mean that they will accept what is sweet and crisp when it is offered to them.” Translated by Knoblick & Riegel (2000, p.329)). *Sweet* is what human beings could sense through the taste receptor cells found in the taste buds on the tongue, whereas there is no such taste receptor to account for *crisp* - it is more like a feeling in our oral cavity when we bite and chew. This suggests that the original meaning of 味 *wèi* contains both the gustation and tactile sensation, at least in Classical Chinese.

In the 6th edition of *Xiandai Hanyu Cidian (The Contemporary Chinese Dictionary)*, 味 *wèi* is literally defined as “the gustatory sensation produced in the tongue by contact with a substance” and “the olfactory sensation produced in the nose by contact with a substance”, indicating its inseparability with gustatory and olfactory senses while having nothing to do with the tactile sense. However, when searching 味道 *wèidào* (the substitute for 味 *wèi* due to the development of disyllabic words in Modern Chinese) in the *Chinese Web 2011 (Mainland, simplified)*³ in the *Sketch Engine* (Kilgarrieff *et al.*, 2004), it is found that this word could also coexist with words which may not strictly relate to gustatory or olfactory sense but is involved with the vocabulary from other sensory modalities, such as 鮮嫩 (*xiānnèn*, ‘fresh and tender’), 辛辣 (*xīnlà*, ‘pungent or spicy’), 爽口 (*shuǎngkǒu*, ‘tasty and refreshing’), 清新 (*qīngxīn*, ‘refreshing’), etc. It shows that even with a clear definition of 味 *wèi* or 味道 *wèidào* in the dictionary, this term is still a rather ambiguous concept for the Chinese. In fact, 味 *wèi* was instantiated as an ‘umbrella term’ which goes beyond gustatory sensation and collocates with all the sensory words in Chinese Buddhist texts (Xiong & Huang, 2016).

The fuzzy meaning of 味 *wèi* or 味道 *wèidào* in Chinese is tantamount to the loose and interchangeable use of *taste* and *flavour* in English.

Scientifically and strictly speaking, *taste* literally refers to the recognition of substances by the taste buds, which relates to gustatory sensation only; while *flavour* is multimodal and engages a combination of all five senses (e.g. Mouritsen & Styrbæk, 2017; Spencer, 2016), and is especially influenced by “tactile, thermal, painful and/or kinaesthetic effects” (Klosse, 2014, p.22; Spence, 2016, p.374). Given the only word 味 *wèi* or 味道 *wèidào* in Chinese accounts for both *taste* and *flavour*, it further suggests that linguistically speaking, 味 *wèi* or 味道 *wèidào* is not limited to gustatory sensory only; other sensory descriptors which are deemed ‘synaesthetic metaphors’⁴ may also contribute to the understanding of tastes and flavours.

1.2 The meaning of ‘dessert’

‘Dessert’ is originally a French word meaning “to de-serve, to remove what has been served” and was later developed by the British and then American in the eighteenth century to limit ‘dessert’ to sweet things only (Jurafsky, 2014, pp.171-176), like puddings, cake, ice cream, etc. By saying ‘dessert’, one does not refer to all sweet foods. For example, Chinese cuisine also consists of a variety of sweet items, like 糕點 (*gāodiǎn*, ‘cakes and pastries’) and Cantonese Tong Sui (literally translated as ‘sugar water’), but ‘dessert’ in the current context refers to only western dessert which is served as the last course in a Western meal. It does not exist in “the grammar of cuisine” on a Chinese dining table (Jurafsky, 2014, p.177). Although western dessert is neither an integral part of a traditional Chinese meal nor an element of Chinese food culture, statistics collected from big data show that the younger generation in China has acquired a growing interest in dessert - among all types of restaurants in China, cake and bakery shops rank at the top (25%) among the generation born after 1990 (“Generation after 90s is not fond of Chinese cuisine any more”, 2018⁵). Given the

compendium of philosophical works compiled under the Qin Dynasty.

³ Accessed at <https://the.sketchengine.co.uk/auth/corpora/>

⁴ ‘Synaesthetic metaphor’ refers to the conception in one sensory modality could be modified by the conception from other sensory domains (see, e.g. Ullmann, 1957; Williams, 1976). For example, *sharp* [TOUCH/SOURCE] *taste* [TASTE/TARGET] - ‘sharp’ is a synaesthetic metaphor to modify TASTE, and the synaesthetic directionality is from TOUCH to TASTE.

⁵ Accessed at http://k.sina.com.cn/article_6440155365_17fdcf8e500100321r.html

craving for western desserts in contemporary China, one wonders how Chinese people describe things like desserts which are not originally part of their culture.

2 Previous Related Works and Research Questions

Firstly, linguistically speaking, taste descriptors are often derivatives from source nouns, referring to components and are ambiguous and polysemous in English (Ankerstein & Pereira, 2013, p.313). Winter (2016a, p.57) also confirms the denominal nature of gustatory vocabulary by claiming that 70% of the gustatory adjectives found in the dictionary are denominal with only 30% having verbal or adjectival origins, among which mostly are derived from food items, e.g. *buttery*, *cheesy*, *chocolatey*, *creamy*, *eggy*, *fruity*, *juicy*, *lemony*, *meaty*, *salty*. While taste sense was found to be particularly “nouny” in English (Strik Lievers & Winter, 2018), in Chinese, the vocabulary labelled as gustatory sensory in Zhao, Huang and Yun (2018) is all adjectives, such as 甘 (*gān*, ‘sweet’), 甜 (*tián*, ‘sweet’), 鹹 (*xián*, ‘salty’), 鮮 (*xiān*, ‘tasty’), 淡 (*dàn*, ‘of mild taste’), 濃 (*nóng*, ‘of intense taste’). This linguistic feature in Chinese is similar to linguistic descriptors describing food in Japanese and Korean. Strauss (2005, p.1444) claimed that an adjective derived from a noun like ‘cream’ would simply indicate the item is literally made from or contains cream or looks like ‘cream’ in Japanese and Korean.

Secondly, Backhouse (1994, p.13) called taste “a cultural sense”, suggesting taste perception has a close relationship with society and is greatly embedded in the culture. In Chinese, Wu (1989) found that the word 辣 (*là*, ‘pungent’) only exists in those regions where people are fond of eating spicy food because of the climate and environment. Besides that, there are only words for bitter, pungent and sour in Uyghur. Moreover, in Maqiao, a village in Jiangsu Province, all tasty things are described with just one word 甜 (*tián*, ‘sweet’) and all the desserts are called 糖 (*táng*, ‘sweets’) (Han, 1996). Apart from these manifestations from different linguistic concepts in various cultures, tastes are also associated with the diverse notions in different cultures. Strauss (2005) asserted that the emphasis on “softness, creaminess or

sweetness” in American food commercials suggest sensual hedonism and pleasure in Western culture whereas in Japanese, the lack of vocabulary capturing the notion of “creaminess or richness” coupled with a focus on “lightness and airiness” reflect “a sense of purity and innocence” in Eastern culture. The hedonistic feature of food is likewise manifested in Jurafsky (2014)’s discussion of the association between sex and dessert. In the million online food reviews, Jurafsky (2014) identified most commonly used words to describe dessert are those from tactile sensation for describing textures and temperatures, such as “rich, moist, sticky, gooey, smooth, spongy, melting”. These expressions are claimed to imply veiled sexual connotations and focus strongly on the feeling in the mouth, rather than the “appearance, smell, taste, or sound” (Jurafsky, 2014, p.103).

Last but not least, taste is also said to involve evaluation, pleasant or unpleasant, like 甜 (*tián*, ‘sweet’) to denote a pleasant feeling while 苦 (*kǔ*, ‘bitter’) to describe the opposite. With a focus on gustatory and olfactory lexicon, Winter (2016b) proposed that these two domains are associated with “more affective and emotional loaded content” with gustatory words being more positive and tend to occur in more positive contexts than olfactory items. Other relevant evaluative features of taste items are seen in Jurafsky (2014)’s mentioning of dessert reviews. He claimed that people have overwhelmingly positive sentiment for dessert, frequently using positive words like “delicious, yummy, fabulous, awesome” when discussing desserts (Jurafsky, 2014, p.104). It is apparent that, in general, positive words occur much more often than negative words in online food reviews. Jurafsky (2014) attributed this phenomenon to the “Pollyanna effect” (also known as “Pollyanna principle” or “positivity bias”), meaning people tend to remember pleasant items more accurately than unpleasant ones.

Since no comparable study has been conducted previously to investigate how Chinese people use sensory vocabulary to narrate their taste experience in real life, this study takes the initiative to build a DESSERT corpus containing online restaurant reviews from the largest restaurant review website *Dazhong Dianping*⁶ (also known as ‘Dianping’ or

⁶ It was established in 2003 and acts as a leading online city life guide and one of the first online consumer service rating

‘Meituan-Dianping⁷’) in Mainland China so as to examine current expressions used in Chinese to describe taste and flavour of desserts. In particular, this paper will address the following three research questions:

- a. What words are frequently used to describe taste and flavour of desserts in Mandarin Chinese and what are the linguistic characteristics of these words?
- b. How sensory vocabulary and sensory modalities interrelate, i.e., what kind of synaesthetic metaphors are used when describing tastes and flavours of desserts in Mandarin Chinese?
- c. How desserts are represented and conceptualized in Chinese culture through the vocabulary used to describe desserts in Mandarin Chinese?

3 Data and Methodology

The DESSERT corpus consists of a total of over 4 million tokens in Simplified Chinese. The data was culled from the online reviews on 30 bakeries and cafés in Beijing, Shanghai and Guangzhou on the website of *Dazhong Dianping*. The shops are listed in a descending order according to the total number of reviews, thus, the 30 shops are those with the most number of comments in the three cities. But not all shops receiving the most comments were chosen as some shops are of the same type. Therefore, for example, only one branch of *Starbucks* is selected. Among the 30 shops, 10 of them are in Beijing, 10 in Shanghai and the other 10 in Guangzhou. This is because firstly, the three cities are among the top first-tier cities in China, the numbers of restaurants and netizens in *Dazhong Dianping* shall constitute a considerable proportion; secondly, it is considered that the distribution across northern, central and southern parts of China will help to reduce the influence of dialects spoken in any particular region. Lastly, those chosen restaurants were further checked to make sure most of the foods sold there are western desserts. As for comments,

sites worldwide to provide restaurant, shopping, entertainment, leisure and day to day living services through its interactive platform. Accessed at <http://www.dianping.com/>.

⁷ Meituan was a Chinese group buying website and was merged with *Dazhong Dianping* in 2015 and is now known as Meituan-Dianping.

only comments under the categories of “Positive Comments” and “Negative Comments” are collected. In all the 30 shops, “Positive Comments” generally account for around 80% of total comments. “Negative Comments” are also chosen in order to see the differences between describing good taste and bad taste, if there are any.

After the restaurants and comments are decided, a third-party web crawler *Octoparse* (*Bazhuayu* in Chinese) is used to scrape the data from the website automatically. With repeated comments excluded, 85,318 positive comments versus 4,007 negative comments were collected as at 8 June 2018. Two corpora, Positive Comments Corpus (hereinafter referred to as ‘PCC’) and Negative Comments Corpus (hereinafter referred to as ‘NCC’), are compiled in the *Sketch Engine* (Kilgariff *et al.*, 2004), with words segmented and parts-of-speech tagged. This has generated 4,524,812 tokens in PCC and 260,551 tokens for NCC. Functions in the *Sketch Engine* (Kilgariff *et al.*, 2004) are used to further examine the data so as to address the above three research questions.

4 Results and Discussion

4.1 Description of Desserts

Firstly, a word list is generated to examine the overall frequency of the vocabulary appearing in PCC. Appendix A presents top 10 frequent words related to tasting experience across three main lexical categories. As indicated by the word frequency, verbs appear much less frequently as compared to nouns and adjectives when describing tasting experience. In terms of adjectives, 甜 (*tián*, ‘sweet’), 膩 (*nì*, ‘fatty/get tired of’), 新鮮 (*xīnxiān*, ‘fresh’), 濃郁 (*nóngyù*, ‘rich/strong’), and 香 (*xiāng*, ‘fragrant/delicious’) are the most concrete ones which are related to the feelings of tasting, but it is not known whether these were used to describe desserts only. With regard to nouns, apart from the specific foods or drinks mentioned in the comments, we have spotted three most frequently used terms which directly relate to the research questions in this paper, i.e., 味道 *wèidào*, 口味 *kǒuwèi* and 口感 *kǒugǎn*.

As discussed in the Introduction, 味道 *wèidào* could be understood as taste, smell as well as flavour in English. However, 口味 (*kǒuwèi*, ‘one’s taste/flavour’) and 口感 (*kǒugǎn*, ‘mouthfeel’) are

also related to taste and flavour of food to some degree. In fact, when using the “Thesaurus” function to generate a list of words similar to 味道 *wèidào*, 口味 *kǒuwèi* ranks the highest with a similarity score of 0.471 and 口感 *kǒugǎn* ranks third with a score of 0.43. In order to differentiate between the three frequently used nouns as well as the near-synonymous pairs, “Word Sketch Difference” is applied to explore the common and exclusive patterns for the three words. With the “Word Sketch” function, the *Sketch Engine* automatically extracts collocations based on grammatical patterns and the collocations are ranked by MI log Frequency (previously known as “salience”) (Kilgarriff *et al.*, 2004).

From the patterns of the three words shown in Appendix B, C and D (only the keyword under ‘subject’ and ‘modifiers’ are shown due to limited space), 味道 *wèidào* is found to be more collocated with gustatory and olfactory vocabulary. Two typical words shown in Appendix B to describe 味道 *wèidào* are 濃 (*nóng*, ‘of intense taste’) and 淡 (*dàn*, ‘of mild taste’). As for 口味 *kǒuwèi*, we can 選擇 (*xuǎnzé*, ‘to choose’) or 嘗試 (*chángshì*, ‘to try’) particular 口味 (*kǒuwèi*, ‘flavour’) and we have our 個人口味 (*gèrén kǒuwèi*, ‘personal taste’). With regard to 口感 (*kǒugǎn*, ‘mouthfeel’), a bunch of tactile terms are listed in Appendix D, and several frequently used terms are 脆 (*cùi*, ‘crisp’), 乾 (*gān*, ‘dry’), 滑 (*huá*, ‘smooth’), 酥 (*sū*, ‘crunchy’) and 軟 (*ruǎn*, ‘soft/tender’). The differences among these three near-synonyms suggest that descriptions for desserts tend to be more frequently collocated with 口感 (*kǒugǎn*, ‘mouthfeel’). ‘Mouthfeel’ is claimed to be a term for the sensory perception which is closely related to taste and aroma but is greatly influenced by “the structure, texture and responsible for the overall impression of the food” (Mouritsen & Styrbæk, 2014, p.6). It is considered a new word which only became prevalent in recent years (only three instances of ‘mouthfeel’ can be found in BNC corpus⁸ while 1,679 tokens exist in English Web 2015 corpus). Nevertheless, that the descriptors of desserts are most likely related to 口感 (*kǒugǎn*, ‘mouthfeel’) rather than 味道 (*wèidào*, ‘taste/smell/flavour’) is consistent with Jurafsky

(2014)’s discussion of vocabulary describing desserts in English, in which it is not our gustatory or olfactory but the tactile sense that plays a major role.

To examine the most frequent vocabulary related to ‘mouthfeel’ of desserts in the corpus and to address the first research question, 口感 (*kǒugǎn*, ‘mouthfeel’) is set as the KWIC (key word in context) and is searched in both the PCC and NCC. Due to a large number of 口感 (*kǒugǎn*, ‘mouthfeel’) existed in the PCC (5,928 instances), only 口感 (*kǒugǎn*, ‘mouthfeel’) that acts as the subject and the object being modified in the sentence are further examined manually.

In 1,734 concordances containing the keyword 口感 (*kǒugǎn*, ‘mouthfeel’) in the PCC, 175 words (types) and 1325 tokens were identified, including 138 monosyllabic and disyllabic adjectives (Top 20 are shown in **Table 1** below), 5 ABB adjectives (e.g. 軟綿綿 *ruǎnmiánmián*, ‘soft’, 硬邦邦 *yìngbāngbāng*, ‘hard’, 甜津津 *tiánjīnjīn*, ‘sweet’), 6 four-word conventionalized phrases (e.g. 入口即化 *rù-kǒu-jí-huà*, ‘melts in one’s mouth’, 甜而不膩 *tián-ér-bù-nì*, ‘acceptably sweet’, 外脆內軟 *wài-cuì-nèi-ruǎn*, ‘crunchy/crispy outside and tender inside’), 4 nouns (層次 *céngcì*, ‘layer’, 嚼勁 *jiáojìn*, ‘chewiness’, 韌性 *rènxìng*, ‘rubbery’, 彈性 *tánxìng*, ‘bouncy’), 5 verbs (回甘 *huígān*, ‘turns from bitterness to sweetness’, 帶甘 *dàigān*, ‘with sweetness’, 爆漿 *bàojiāng*, ‘molten’, 層疊 *céngdié*, ‘layer’, 刺激 *cìjī*, ‘stimulating’), 4 onomatopoeia (咯吱咯吱 *gēzhī-gēzhī*, ‘crunching sound’, 沙沙 *shāshā*, ‘rustling sound’, 啞啞 *yāyā*, ‘smacking sound’, 咣咣 *guāguā* ‘bounce sound’), 9 dialect words (e.g. Q ‘chewy’, Q 彈 *Q-tán* ‘chewy’, 紮實 *zhāshí*, ‘solid’, 面 *miàn*, ‘mushy’, 粉 *fěn*, ‘mushy’), and 4 English words (heavy, creamy, juicy, fresh).

Word	Tokens	Word	Tokens
1 甜 <i>tián</i> ‘sweet’	89	2 膩 <i>nì</i> ‘get tired of’	67
3 濃郁 <i>nóngyù</i> ‘rich/strong’	59	4 脆 <i>cùi</i> ‘crisp’	57
5 清爽 <i>qīngshuǎng</i> ‘refreshing’	43	6 豐富 <i>fēngfù</i> ‘rich’	43
7 苦 <i>kǔ</i> ‘bitter’	42	8 鬆軟 <i>sōngruǎn</i> ‘fluffy’	41
9 酥脆 <i>sūcùi</i>	39	10 酸 <i>suān</i>	28

⁸ BNC corpus was created in the 1980s – early 1990s.

‘crisp/crunchy’		‘sour’	
11 細膩 <i>xìni</i> ‘fine and smooth’	28	12 硬 <i>yìng</i> ‘hard’	27
13 綿密 <i>miánmì</i> ‘creamy’	27	14 甜膩 <i>tiánnì</i> ‘sweet’	26
15 淡 <i>dàn</i> ‘of mild taste’	26	16 清新 <i>qīngxīn</i> ‘fresh’	25
17 乾 <i>gān</i> ‘dry’	24	18 香 <i>xiāng</i> ‘fragrant/delicious’	21
19 新鮮 <i>xīnxiān</i> ‘fresh’	20	20 軟 <i>ruǎn</i> ‘soft/tender’	18

Table 1 - Top 20 monosyllabic and disyllabic adjectives describing ‘mouthfeel’ of desserts in PCC

On the other hand, NCC only contains 175 concordances with the keyword 口感 (*kǒugǎn*, ‘mouthfeel’). 31 words (types) and 46 tokens were found as the ‘mouthfeel’ of desserts (Top 10 are shown in **Table 2** below as the frequency is quite low after the first ten words), in which, 4 of them are ABB adjectives (two not in the PCC are 乾巴巴 *gānbābā* ‘dry’ and 黏糊糊 *niánhuhu* ‘sticky’), 2 four-word conventionalized phrases (淡而無味 *dàn-ér-wú-wèi* ‘tasteless’ and 甜而不膩 *tián-ér-bù-nì* ‘acceptably sweet’), 1 dialect word (擰唧唧 ‘mushy’), and the remaining 24 words are all monosyllabic and disyllabic adjectives. PCC and NCC share most of the common ‘mouthfeel’ vocabulary, with only 7 terms in NCC could not be found in PCC, including 糊 (*hú*, ‘mushy’), 空 (*kōng*, ‘empty’), 遲鈍 (*chídùn*, ‘dull’), 高冷 (*gāolěng*, ‘arrogant’) and the above-mentioned 2 ABB adjectives and a four-word conventionalized phrase (i.e. 淡而無味 *dàn-ér-wú-wèi*, ‘tasteless’).

Word	Tokens	Word	Tokens
1 硬 <i>yìng</i> ‘hard’	5	2 粗糙 <i>cūcāo</i> ‘coarse’	4
3 乾巴巴 <i>gānbābā</i> ‘dry’	3	4 甜 <i>tián</i> ‘sweet’	2
5 軟綿綿 <i>ruǎnmiánmián</i> ‘soft’	2	6 膩 <i>nì</i> ‘get tired of’	2
7 淡 <i>dàn</i> ‘of mild taste’	2	8 醇厚 <i>chúnhòu</i> ‘mellow’	2
9 新鮮 <i>xīnxiān</i> ‘fresh’	2	10 酥軟 <i>sūruǎn</i> , ‘crunchy and soft’	1

Table 2 - Top 10 monosyllabic and disyllabic adjectives describing ‘mouthfeel’ of desserts in NCC

Comparing the vocabulary used to describe good and bad taste/flavour of desserts in Chinese, it is found that very few items are directly associated with negative valence - 硬 (*yìng*, ‘hard’), 粗糙 (*cūcāo*, ‘coarse’), 乾 (*gān*, ‘dry’) and 膩 (*nì*, ‘get tired of’) are possibly the only four items mainly generate negative feelings. In these, 膩 (*nì*, ‘get tired of’) is an interesting word which is hard to locate its equivalent in English. Most of the 膩 (*nì*, ‘get tired of’) in the DESSERT corpus do not mean ‘fatty’ or ‘greasy’, but it is more like the sick feeling when you feel something is too sweet or get tired of eating too much sweet or greasy stuff. For example:

- 濃郁的巧克力包裹著鬆軟的蛋糕，軟硬適中，口感絲滑醇厚卻不甜膩。
Nóngyù de qiǎokèlì bāoguǒ zhe sōngruǎn
Rich DE chocolate wrap ZHE fluffy
de dàngāo, ruǎnyìng shìzhōng, kǒugǎn
DE cake soft-hard moderate mouthfeel
sīhuá chúnhòu què bù tiánnì.
smooth mellow however not sweet-ni
‘Rich chocolate wrapped with fluffy cakes, moderate hardness, soft and mellow but not too sweet.’
- 抹茶芝士蛋糕的奶酪味好厚重，吃起來好滿足，但一塊下來就會有點膩。
Mǒchá zhīshì dàngāo de nǎilào wèi hǎo
Matcha cheese cake DE cheese taste very
hòuzhòng, chī qīlái hǎo mǎnzú, dàn yī
thick eat up very satisfied but one
kuài xiàlái jiù huì yǒudiǎn nì.
piece down then will a bit ni
‘The cheese of Matcha cheesecake is very thick and very yummy, but we got a bit tired of it after finishing the piece.’

The DESSERT corpus demonstrates that most of the time people will just add negative structures to the positive words to express their dislikes, such as 不... (*bù...*, ‘not...’) and 太...了 (*tài...le*, ‘too...’), as follows:

- 鬆餅賣相不錯，可惜不脆，軟軟的。
Sōngbǐng mǎixiàng bùcuò, kěxī bù cuì,
Muffin sell-look not-bad pity not crispy
ruǎn ruǎn de.
soft soft DE
‘The muffin looks good, but unfortunately it is not crispy, too soft.’

- d. 布朗尼口感還不錯，但太甜了。
Bùlǎngní kǒugǎn hái bùcuò,
 Brownie mouthfeel relative not bad
dàn tài tián le.
 but too sweet-LE
 ‘Brownie tastes good, but too sweet.’

To sum up, concerning the descriptions of taste and flavour of desserts, it is found that vocabulary describing 口感 (*kǒugǎn*, ‘mouthfeel’) is much more relevant than those for 味道 (*wèidào*, ‘taste/smell/flavour’) or 口味 (*kǒuwèi*, ‘one’s taste/flavour’), as evidenced by the hundreds of ‘mouthfeel’ words identified. Most of these terms are adjectives and people tend to combine ‘preferred’ morphemes to make up compound words to describe their ‘preferable’ taste and flavour, such as three morphemes 甜 (*tián*, ‘sweet’), 香 (*xiāng*, ‘fragrant/delicious’) and 滑 (*huá*, ‘smooth’) in the compound words 香甜 (*xiāngtián*, ‘delicious and sweet’), 甜滑 (*tiánhuá*, ‘sweet and smooth’) and 香滑 (*xiānghuá*, ‘delicious and smooth’). In addition, compared to the overwhelmingly positive words of describing desserts, negative words are rare in Chinese, and this is consistent with Jurafsky (2014)’s discussion mentioned previously.

4.2 Interrelation among sensory modalities

As mentioned in the discussion in the Introduction, ‘flavour’ denotes the integrated effect of taste and smell sensations, as well as mouthfeel and chemesthesis⁹ in the oral cavity (Mouritsen & Styrbæk, 2017, p.5). In the foregoing part, ‘mouthfeel’ is seen as critical when discussing desserts. Klose (2014, p.38) claimed that “there is no flavour without some kind of mouthfeel” and ‘mouthfeel’ is considered the “major determinants of consumer acceptance and preference for foods and beverages” (Guinard & Mazzucchelli, 1996, p.213). Given the importance of ‘mouthfeel’ in desserts, in this section, some linguistic evidence in the DESSERT corpus will be presented for the purpose of discussing the interactions among sensory modalities.

⁹ Chemesthesis belongs to tactile sense that relies on the same receptor mechanisms as those that convey pain, touch and temperature on the skin.

In all of the 182 ‘mouthfeel’ words identified in the previous section, around 80 of them belong to tactile sensation (~44%), rendering them as ‘synaesthetic metaphors’ to depict TASTE of desserts. The identification of synaesthetic metaphors mainly follows Zhao, Xiong and Huang (2018)’s methodology of studying linguistic synaesthesia in Chinese, i.e., to classify the sensory vocabulary into five senses (vision, hearing, smell, taste and touch), to check the etymology of the word, and to determine if the word has extended meaning of describing other sensory modalities. In regard to these synaesthetic metaphors, first of all, they belong to the tactile sense as they can be sensed by tactile receptors, including mechanoreceptors (which pick up sensations like pressure, vibration and texture), thermoreceptors (related to temperature like hot and cold), pain receptors, and proprioceptors (deep pressure sense felt by muscles, tendons and joints when we make movements) (Popova, 2005); secondly, they are all used to describe feelings in the mouth, i.e., tastes and flavours. In particular, it is found that taste/flavour of desserts is largely influenced by the texture - 脆 (*cùi*, ‘crisp’), 滑 (*huá*, ‘smooth’), 粗 (*cū*, ‘coarse’), 黏 (*nián*, ‘sticky’), 軟 (*ruǎn*, ‘soft’), to name a few. Temperature also plays a part but instead of the two polarities, hot and cold, the temperature-related items are all rather ‘pleasant’ feelings, like 溫 (*wēn*, ‘warm’), 暖 (*nuǎn*, ‘warm’), 冰 (*bīng*, ‘icy’), and 涼 (*liáng*, ‘cool’). This may indicate that desserts should preferably be at a mild and moderate temperature rather than being hot or cold.

Apart from the tactile vocabulary, around 20 ‘mouthfeel’ items were defined as gustatory terms, which are in line with basic five taste qualities defined neurologically, including *sour*, *sweet*, *salty*, *bitter* and *umami*¹⁰ (Mouritsen & Styrbæk, 2014), and words originally denoting taste sense, like 濃 (*nóng*, ‘of intense taste’), 淡 (*dàn*, ‘of mild taste’), 醇 (*chún*, ‘pure’), and 美味 (*měiwèi*, ‘tasty’)¹¹. Interestingly, olfactory (smell) terms are not found in the descriptions of ‘mouthfeel’ of desserts,

¹⁰ It is a word in Japanese which combines the ideas of *umai* “delicious” and *mi* “essence” and known as 鮮 *xiān* in Mandarin Chinese.

¹¹ Original meanings of these words were checked in *ShuoWenJieZi* in *Handian*. Accessed at <http://www.zdic.net/>.

except one olfactory word 香 (*xiāng*, ‘fragrant/delicious’). But this word has limited smell connotation in DESSERT corpus. Instead, it transfers to the taste sense, meaning tasty or delicious. Indeed, taste and smell are closely intertwined in a way that perception of taste is apparently induced by odours and gustatory terms are also used to describe odours (Auvray & Spence, 2008).

In addition, it is found that VISION and HEARING have the tendency to transfer to TASTE of desserts as well¹². Visual items including 薄 (*báo*, ‘mild’), 清澈 (*qīngchè*, ‘clear’), 層次 (*céngcì*, layer), 蓬鬆 (*péngsōng*, ‘fluffy’), 濃密 (*nóngmì*, ‘thick/dense’), 乾淨 (*gānjìng*, ‘clean’) and etc., and auditory terms involving onomatopoeic words as shown previously both suggest that flavour perception is multisensory, it integrates all the five sensory modalities, although to varying degrees.

4.3 Conceptualization of desserts

The last but not least research question being addressed is how DESSERT is represented and conceptualized in Chinese culture. It is known that the main purpose of desserts is to make people happy rather than to nourish the body. Neurological studies suggest that sweet foods are highly desirable due to the powerful impact sugar has on the reward system in the brain, which is the same area that drugs and sexual behaviour activate (Avena, 2014). This is perhaps the reason why, in English and many other languages, words expressing sensuality and sexuality are dominant when used to describe good desserts. However, in Chinese, where explicit sensual expressions are not encouraged, some metaphorical expressions are found noteworthy for discussion, such as:

- a. ...醇厚的口感中帶些清新**調皮**...
 ...*chún hòu de kǒu gǎn zhōng dài xiē*
 mello DE mouthfeel in with some
qīng xīn tiáo pí...
 freshness naughty

‘...mellow taste with some freshness and naughtiness...’

- b. ...口感不雜，不**浮誇**。
 ...*kǒu gǎn bù zá, bù fú kuā*.
 mouthfeel not mixed not boastful
 ‘...the taste is not mixed, and not boastful.’
- c. ...口感很充實**硬朗**...
 ...*kǒu gǎn hěn chōng shí yìng lǎng*...
 mouthfeel very rich tough
 ‘...the taste is very rich and tough...’

Words highlighted in bold imply that desserts can be conceptualized as a person’s personality in Chinese, and often a pleasant one. On the contrary, 遲鈍 (*chídùn*, ‘dull’) and 高冷 (*gāolěng*, ‘arrogant’), deemed as unpleasant personalities, are used to describe bad taste. These adjectives stem from impressions of personalities gained through social interactional contact. Thus, personifying delicious desserts as pleasant characters using such positive adjectives illustrates that, in Chinese culture, language emanating from social interactional experience, rather than feeling of physical bodily pleasure only, is also used to describe desserts.

5 Conclusion

Despite the fact that tasting is a subjective experience, with the online corpus consisting of reviews of food and restaurants, we can explore how people perceive foods in reality. Focusing on the descriptions of DESSERT in Chinese, this study has revealed that ‘mouthfeel’ is more often discussed than ‘taste’ or ‘smell’ when desserts are mentioned in Chinese. As ‘mouthfeel’ mostly consists of tactile vocabulary and is influenced by gustatory, visual and auditory terms to some extent, this paper further provides manifestations for linguistic synaesthesia in which TASTE can be treated as a target domain and other sensory domains all have impacts on it.

This study could be replicated to investigate descriptions of other types of food in Chinese, with an emphasis on looking into how sensory modalities are interrelated. Comparisons between Chinese and other languages on food also need to be undertaken in order to unveil cultural differences in this subject.

¹² Note this tendency does not show in Zhao, Xiong and Huang (2018)’s directionality of linguistic synaesthesia in Chinese. It is likely that the instantiations of VISION and HEARING transferring to TASTE are not frequent and common in Mandarin Chinese.

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Appendices

Nouns		Adjectives		Verbs	
Word	Frequency	Word	Frequency	Word	Frequency
咖啡 <i>kāfēi</i> , ‘coffee’	30,379	好 <i>hǎo</i> , ‘good’	38,866	吃 <i>chī</i> , ‘to eat’	27,752
蛋糕 <i>dàngāo</i> , ‘cake’	17,672	不錯 <i>bùcuò</i> , ‘not bad’	36,280	感覺 <i>gǎnjué</i> , ‘to feel’	15,336
味道 <i>wèidào</i> , ‘taste/smell/flavour’	25,240	好吃 <i>hǎochī</i> , ‘tasty’	18,749	喝 <i>hē</i> , ‘to drink’	14,775
巧克力 <i>qiǎokèlì</i> , ‘chocolate’	11,593	一般 <i>yībān</i> , ‘alright’	9,128	烘焙 <i>hōngbèi</i> , ‘to bake’	2,621
口味 <i>kǒuwèi</i> , ‘one’s taste/flavour’	8,142	甜 <i>tián</i> , ‘sweet’	8,301	嘗試 <i>chángshì</i> , ‘to try’	2,183
甜品 <i>tiánpǐn</i> , ‘dessert’	6,126	好喝 <i>hǎohē</i> , ‘good to drink’	5,113	體驗 <i>tīyàn</i> , ‘to experience’	2,175
抹茶 <i>mǒchá</i> , ‘matcha’	6,072	膩 <i>nì</i> , ‘fatty/get tired of’	4,245	配 <i>pèi</i> , ‘to go with’	2,030
口感 <i>kǒugǎn</i> , ‘mouthfeel’	5,928	新鮮 <i>xīnxiān</i> , ‘fresh’	2,715	搭配 <i>dāpèi</i> , ‘to go with’	1,877
麵包 <i>miànbāo</i> , ‘bread’	5,721	濃郁 <i>nóngyù</i> , ‘rich/strong’	2,677	煙熏 <i>yānxūn</i> , ‘smoked’	1,752
拿鐵 <i>Nátǐě</i> , ‘Latte’	5,392	香 <i>xiāng</i> , ‘fragrant/delicious’	2,338	品嚐 <i>pǐncháng</i> , ‘to try’	1,167

Appendix A. Top 10 frequent words related to tasting experience across three main lexical categories

Subject	Frequency	MI log Frequency	Modifiers (including Adjective Modifiers and Noun Modifiers)	Frequency	MI log Frequency
很好 <i>hěnhǎo</i> , ‘very good’	57	8.2	抹茶 <i>mǒchá</i> , ‘matcha’	60	10.1
好 <i>hǎo</i> , ‘good’	40	7.7	濃郁 <i>nóngyù</i> , ‘rich/strong’	42	9.4
不過不失 <i>bù-guò-bù-shī</i> , ‘alright’	31	7.4	淡淡 <i>dàndàn</i> , ‘of mild taste’	32	9.0
膩/不膩 <i>nì/bù nì</i> , ‘fatty/not fatty’; ‘tired of/not tired of’	21	6.8	特別 <i>tèbié</i> , ‘special’	27	8.8
不錯 <i>bùcuò</i> , ‘not bad’	18	6.7	濃濃 <i>nóngnóng</i> , ‘of intense taste’	27	8.7

Appendix B. 味道 (*wèidào*, ‘taste/smell/flavour’) only patterns (first 5 words)

Subject	Frequency	MI log Frequency	Modifiers (including Adjective Modifiers and Noun Modifiers)	Frequency	MI log Frequency
選擇 <i>xuǎnzé</i> , 'choice'	42	9.1	個人 <i>gèrén</i> , 'personal'	131	10.9
選 <i>xuǎn</i> , 'to choose'	20	8.1	我的 <i>wǒ de</i> , 'my'	94	10.6
可選 <i>kě xuǎn</i> , 'can choose'	12	7.7	新 <i>xīn</i> , 'new'	6	8.5
嘗試 <i>chángshì</i> , 'to try'	14	7.7	沒有 <i>méiyǒu</i> , 'no'	5	8.5
保持 <i>bǎochí</i> , 'to keep'	10	7.4	甜膩 <i>tiánnì</i> , 'sweet'	5	8.4

Appendix C. 口味 (*kǒuwèi*, 'one's taste/flavour') only patterns (first 5 words)

Subject	Frequency	MI log Frequency	Modifiers (including Adjective Modifiers and Noun Modifiers)	Frequency	MI log Frequency
乾 <i>gān</i> , 'dry'	12	8.3	脆 <i>cùi</i> , 'crisp'	14	9.3
順滑 <i>shùnhuá</i> , 'smooth'	7	7.7	酥脆 <i>sūcùi</i> , 'crunchy'	14	9.3
細滑 <i>xìhuá</i> , 'fine and smooth'	6	7.5	鬆軟 <i>sōngruǎn</i> , 'fluffy'	12	9.1
綿綿 <i>miánmián</i> , 'spongy'	5	7.2	脆脆 <i>cùicùi</i> , 'crisp'	12	9.1
酥軟 <i>sūruǎn</i> , 'crunchy and soft'	5	7.2	膩 <i>nì</i> , 'fatty/get tired of'	9	8.6

Appendix D. 口感 (*kǒugǎn*, 'mouthfeel') only patterns (first 5 words)