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ARTICLE

Conceptual metaphor in areal perspective: time, space, and contact in the Sinosphere

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Abstract

This paper discusses spatio-temporal metaphors in three regions in and around China from the perspective of language contact, looking for evidence of areal convergence or transfer of the conceptual metaphors. The approach fits broadly within the framework of Cognitive Contact Linguistics. After a review of spatio-temporal metaphors in the Sinitic languages, I sketch out the relevant metaphors in languages spoken in northwest China (Xinjiang and the Qinghai-Gansu Sprachbund), in and near northeast China, and in south China and Taiwan – many of which have not been discussed previously in the literature on conceptual metaphor. The study reveals evidence for metaphor transfer involving the up-down spatial dimension from Sinitic to Japanese and Korean, contact-facilitated extension of metaphor involving the front-back dimension in Tsou, and possible transfer of front-back metaphor to other languages of Taiwan. Several of the lexical items used in front-back metaphorical expressions in Santa, two Hmong varieties, Japanese, and Korean are borrowed from Sinitic, but these do not clearly represent transfer of the conceptual mapping.

Keywords: metaphor transfer; language contact; areal linguistics; spatio-temporal metaphor; Sinitic languages

1. Introduction

For any given language at any given point in time, some of its features are ones that it inherited from an ancestor language (whether recent or ancient), others are innovations that develop as the language changes, and still others are due to language contact. This is as true of the conceptual structure reflected in the language as it is of structural aspects such as phonology, syntax, and the lexicon. The literature on areal linguistics and language contact has long recognized the ways cognition (including metaphor) shapes language change and grammaticalization in general and contact-induced change specifically (e.g., Thomason & Kaufman, 1988; Weinreich, 1953), but work has often focused more on structural patterns without keeping cognition at the center of the discussion. On the other hand, much of the work in cognitive linguistics

has focused on individual languages as independent systems, and rarely considers the role of bilingualism and language contact. The present paper builds on recent work aiming to bridge this (sub-)disciplinary gap. It discusses a particular set of conceptual metaphors from the perspective of contact linguistics and illustrates the process of analysis involved and the additional insight that can be gained by doing so.

The case study discussed here is the set of mappings between spatial and temporal domains in what might be called the Sinosphere, that is, the area where the Chinese languages such as Mandarin, Cantonese, Wu, Hakka, etc. and their many local varieties (henceforth 'Sinitic languages' or 'Chinese') come into contact with languages from other phylogenetic groups. In this paper, I examine temporal expressions in a number of languages spoken in three regions of the Sinosphere – the northwest, the northeast, and the south – to see if there is evidence of convergence or transfer of the conceptual metaphors. Due to space limitations, the treatment of each language is necessarily somewhat brief. The spatio-temporal metaphors of each language are not described in full, but the hope is that this survey will suffice to illustrate the process and yield some interesting findings that would not be apparent without the areal context.

This paper is organized as follows. Section 2 reviews spatio-temporal metaphor and the idea of conceptual transfer, and introduces the details of spatio-temporal metaphors in the Sinitic languages. Section 3 surveys metaphor-based temporal expressions in other languages in the three contact regions and evaluates whether there is evidence for metaphor transfer. Section 4 closes with a summary and discussion.

2. Background: spatio-temporal metaphors, contact, and the Sinitic languages

2.1. Spatio-temporal metaphors

In Conceptual Metaphor Theory (Lakoff & Johnson, 1980), a conceptual metaphor exists when concepts from a source domain are employed in the conceptualization of a target domain. Even before Lakoff & Johnson's seminal work, Clark (1973) had already described the two primary images used to conceptualize time in English, dubbed Moving Ego and Moving Time. In Moving Ego, the person in the present 'approaches' time events that are 'ahead of' her, that is, in the future; the past lies 'behind'. In Moving Time, the stationary observer faces the future and watches as time events 'approach' her. Each time event has a 'front' and 'back' so that future events that are 'ahead of' other events are also closer to the speaker, whereas 'behind' events are further away. This explains the apparent contradictions in languages that have expressions implying a future-facing ego but associate 'front' with past in other expressions, for example, English (Lakoff & Johnson, 1980) or Mandarin (Yu, 1998). Thus, English *before*, which indicates an earlier time but derives from a root meaning 'front,' represents a conceptualization of the 'front' side of the time events and does not imply that Ego is facing the past.

While temporal reference can be handled with many types of linguistic devices, including iconicity of sequencing, dependent verb forms, tense/aspect distinctions, etc., many of which do not particularly involve metaphor, the use of spatial concepts in at least some part of the conceptualization of time is a near-universal trend across the world's languages (see, e.g., Haspelmath, 1997; Kouteva et al., 2019). The last

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several decades have seen the development of a vast literature on spatio-temporal metaphors, for example, Boroditsky (2000), Boroditsky et al. (2011), Boroditsky and Ramscar (2002), Casasanto and Boroditsky (2008), Núñez and Cooperrider (2013), and Moore (2011, 2017), including interesting recent findings for Aymara (Núñez & Sweetser, 2006), Moroccan Arabic (de la Fuente et al., 2014), Vietnamese (Sullivan & Bui, 2016), Mandarin Chinese (Li & Cao, 2018), and Yupno (Cooperrider et al., 2022).

2.2. Spatio-temporal reference in Sinitic

Despite the diversity in phonology and other structural features across the Sinitic languages, the primary conceptual structure for temporal metaphors is generally consistent. Very similar temporal expressions utilizing the front-back axis and the up-down axis are used all across the Sinitic group, suggesting that these metaphors were inherited from an early ancestor language as the Sinitic languages developed. For the front-back axis, the relevant orientation comes from the morphemes *qián* 'front'(前) and *hòu* 'back' (後/后). These can be used in expressions that point to a future-facing ego, like *wǒmen qiánmiǎn de lù* 'the road in front of us,' which can be interpreted as meaning 'our future,' but they occur more often in expressions where 'front' = 'before' and 'back' = 'after,' reflecting frames with time reference points. If event B is 'in back of' event A, it comes after it, as in (1). If no event A is specified, as in (2), the reference point is assumed to be either the time of speaking or a time retrievable from discourse context. Table 1 presents additional examples.

(Note: Mandarin *pinyin* transcription is used in the examples and discussion here. Bold font marks morphemes referencing a spatial axis.)

(1) Mandarin: wèishénme wǒ shèzhì wánle yǐ**hòu** hái shì mòrèn
why I install finish-COMP behind still be default
de hēisè zìtǐ ne?
ATTR black font PTCL
'Why is it still the default black font after I've set it up [to change the default]?'

(2) Mandarin: èrshí nián **qián** de lǎo zhàopiàn
20 year front LNK old photo
'old photos from 20 years ago'

The literature on conceptual metaphor has discussed these mappings in Mandarin (e.g., Boroditsky, 2001; Yu, 1998), but it is important to note that they are employed

Table 1. Front-back axis in Mandarin

'front' = 'before'			'back' = 'after'		
yǐ**qián**	以前	'before, earlier'	yǐ**hòu**	以后	'afterwards, later'
qiántiān	前天	'day before yesterday'	**hòu**tiān	后天	'day after tomorrow'
qiánniǎn	前年	'year before last'	**hòu**niǎn	后年	'year after next'
shí nián **qián**	十年前	'ten years ago'	shí nián **hòu**	十年后	'ten years later/from now'

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Table 2. *Up-down axis in Mandarin*

'up' = 'earlier'			'down' = 'later'		
shàng cǐ	上次	'last time'	**xià** cǐ	下次	'next time'
shàng ge xīngqī	上个星期	'last week'	**xià** ge xīngqī	下个星期	'next week'
shàng wǔ	上午	'morning'	**xià** wǔ	下午	'afternoon'
yuè **tóu**	月头	'start of the month'	yuè **dǐ**	月底	'end of the month'
shàngxún	上旬	'first third of the month'	**xià**xún	下旬	'last third of the month'

across the entire Sinitic group. For sake of space, only Mandarin examples are shown here, but corresponding examples from Cantonese, Wu, Hakka, and Taiwanese (Hokkien/Southern Min) are provided in the Appendix (Tables A.1 and A.2).

The up-down axis is used for indicating specific time periods with reference to the present, as in 'next week' or 'last week.' 'Up-down' expressions also indicate earlier or later segments of a time unit, as in 'the start of the month' or 'the second half of the day' (see Table 2). The member of each pair expressing the earlier time ('last week', 'start of the month') is indicated with *shàng* 'up, above' (上) or *tóu* 'head' (traditional: 頭, simplified: 头). The later time ('next week', 'second half of the month') is indicated with *xià* 'down, below' (下) or *dǐ* 'base' (底). Terms with *zhōng* 'middle' also exist for some of them: *zhōngwǔ* 'noon,' *zhōngxún* 'middle third of the month.'

Corresponding forms for other Sinitic languages are provided in the Appendix (Tables A.1 and A.2), all of which are cognate with the Mandarin forms provided here, with the following exceptions: Cantonese uses *méih* 'tail' rather than *xià* in expressions for 'end of the month/year,' and Taiwanese has *téng* 'peak' where others have *shàng*. Unexpected forms for 'morning' and 'afternoon' were found for Wu, but my consultant was not able to gloss the individual morphemes. Taiwanese also has *āu* 'back' in the expression *āu lé-pài* 'next week,' and it does not use the expected cognate of Mandarin *shàng* in the word for 'morning' (*tàu zà* 'noon early').

2.3. Metaphor and language contact

Conceptual metaphor and language contact are situated in the minds of individual bilingual speakers, but their effects can be observed anywhere from the behavior of individuals in discourse contexts and psycholinguistic experiments to the lexicon and grammar of entire languages. The relationship between individual speakers and language systems is cyclical and dynamic: the structure of a language conventionalizes out of the aggregated usage patterns of individual speakers, and then that structure in turn shapes the cognitive development of present and future generations of speakers, and so on. This study surveys language systems as represented in grammatical descriptions and collections of texts and conversations, a first step which can generate hypotheses about what structures might exist in the cognition of individuals who speak these languages.

In the language contact literature, transfer of lexical material or grammatical patterns happens when a bilingual speaker accesses elements of their repertoire in one language while speaking in the other (e.g., Matras & Sakel, 2007; Thomason &

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Kaufman, 1988; Weinreich, 1953). This often results in L1 features appearing in a speaker's L2, but it can go the other way as well. In recent cognitive linguistics literature, the term *conceptual transfer* has been used to describe situations in which a speaker's use of one language reflects the conceptual categories of another language, typically with L1 influencing L2 (e.g., Sharifian, 2015; Wolf & Polzenhagen, 2009) in aspects like motion events (e.g., Brown & Gullberg, 2011; Daller et al., 2011) or time/tense and emotions (Odlin, 2005).

The idea of conceptual metaphors being transferred has received less attention – for example, only one chapter in Callies and Degani's (2021) volume on metaphor in World Englishes focuses directly on the transfer of metaphorical conceptualizations. In a study on Akan and English, Ansah (2011) explores the metaphorical conceptualizations of ANGER and FEAR in linguistic expressions reported by monolingual Akan speakers and Akan–English bilingual speakers as compared to the literature on native/monolingual English. While subtle differences were found between the groups, bilingual speakers did not report using any Akan-specific mappings in their English. Mendes de Oliveira (2021), on the other hand, does find linguistic and gestural evidence for metaphor transfer in an analysis of two video interviews with a bilingual speaker of Brazilian Portuguese and English.

A recently proposed framework called Cognitive Contact Linguistics (Zenner, 2013) combines cognitive linguistics and language contact. Its central objective is 'to explore how the guiding principles of Cognitive Linguistics apply to the bi- or multilingual mind in its dynamic bi- and multilingual environment, how this feeds back to our general understanding of these guiding principles, and how we can as a result better grasp how the interaction between cognition and context results in contact-induced variation and change' (Zenner et al., 2019, p. 4). Here too, though, the idea of metaphor in contact has just begun to be explored, and so far has mainly been applied to varieties of English. Chapter 5 in Zenner et al. (2019) explains spatial expressions in Irish English in relation to metaphors of CONTAINMENT and SUPPORT in Irish, and Chapter 6 finds variation in the cultural models of WITCH, WOMAN, and HOMOSEXUALITY in British, Indian, and Nigerian English, which will lead to different mappings and entailments in metaphors involving these concepts. The present paper can be seen as broadly fitting within the program of Cognitive Contact Linguistics, aiming to extend its application beyond contact situations involving European languages and to further explore the idea of metaphors in contact.

Finally, in the psycholinguistics literature, Boroditsky's (2001) classic study on time metaphor in Mandarin and English does not frame the experiments as being primarily about language contact, but they do in fact deal directly with bilingualism and contact. When the Mandarin–English bilingual participants in the first two experiments showed faster reaction times in responding to 'earlier/later' prompts in English after being primed with vertical images, they were assumed to be accessing the metaphorical conceptual structure of their L1 (Mandarin) while performing tasks in an L2 (English). In the third experiment, language contact was simulated by teaching English speakers 'a new way to talk about time' using the English words 'above/higher than' and 'below/lower than' in Mandarin-style constructions for 'before' and 'after.' Even brief training with the novel metaphoric constructions yielded statistically significant effects for these artificially 'bilingual' participants.

The results surveyed above indicate that the transfer of spatio-temporal metaphors in the cognitive systems of individual bilinguals does happen. The utterance in (3), attested in casual conversation, indicates that the up-down mapping from the

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speaker's Sinitic L1 is being accessed as he produces the sentence in his L2 English. The phrase 'at the bottom of this month' corresponds to the Mandarin equivalent *zhè yuè dǐ* 'this month base' (cf. Table 2 above), in which the concept of a lower physical part stands for the later part of a temporal unit.

(3) We also plan to visit them, maybe **at the bottom of** this month.
[intended: at the end of this month]
(speaker from Taiwan; noted July 10, 2023 in Santa Barbara, CA)

If such transfers happen in the cognition and speech of a sufficient number of bilingual speakers of a language, the transferred metaphors could eventually become part of that language, so that speakers in later generations can acquire the borrowed conceptual mapping even if they themselves are not bilingual in the original model language.

There have been some suggestions of this in the literature on spatio-temporal metaphors in East and Southeast Asia, but it has not been pursued in detail. Radden (2011) describes spatio-temporal metaphors in Mandarin, Korean, Japanese, and Vietnamese, and the end of the paper briefly suggests that contact could be responsible for some of the similarities. Bisang (1996) describes the grammaticalization pathway *noun* > *class noun* > *relational noun* > *conjunctional noun*, specifically discussing the 'front' and 'back' nouns in Chinese that developed functions as temporal conjunctions, and demonstrates similar functions relational nouns in Hmong, Vietnamese, Thai, and Cambodian. However, Bisang's discussion does not raise the possibility of a contact-based account of the similarity, and Radden does not go into any detail beyond just suggesting contact as an explanation. This leaves us, therefore, with a gap to be explored.

3. Spatio-temporal metaphors in three areas of the Sinosphere

Language contact has been an important factor in the development of the Sinitic languages since their earliest known history. Old Chinese appears to have emerged from contact between the Sino-Tibetan Zhou dynasty and the Shang dynasty it conquered, which spoke one or more mainland Southeast Asian languages (DeLancey, 2013). Since then, the Sinitic languages have developed in a myriad of contact situations due to waves of population migration, including the movement of non-Chinese people into areas populated by Chinese, movement of Chinese into areas populated by others, and movement of Chinese into areas populated by speakers of other Chinese varieties (LaPolla, 2001). In broad terms, much of the structural divergence across the Sinitic languages can be attributed to contact with Altaic languages in the north and contact with Tai-Kadai and other mainland Southeast Asian languages in the south (Chappell, 2017; Hashimoto, 1976; Szeto & Yurayong, 2021). The complex history of internal and external contact has led some scholars to the conclusion that a family tree model is inadequate to describe the development of the Sinitic languages, or indeed of Sino-Tibetan overall (Chappell, 2001; LaPolla, 2001).

In this section, I examine languages spoken in three regions around the Sinosphere to see if any of the metaphorical structures have transferred through contact. Because front-back time is so common cross-linguistically, simply identifying temporal

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expressions in adjacent languages referring to the front-back axis does not constitute evidence for metaphor transfer. Clear evidence that a conceptual metaphor has transferred and become a productive cognitive mechanism in the recipient language would include borrowed morphemes used with both spatial and temporal senses, mappings/polysemies parallel to the source ones but using native morphemes, especially if they are not attested in pre-contact forms of the language or in related languages that were not in contact with the source language, and further elaboration/extension of the relevant mappings to produce spatio-temporal expressions beyond the ones attested in the source. A summary of results for the surveyed languages can be found in Table 3, with the cells representing possible cases of metaphor transfer highlighted.

3.1. The Northwest

Northwest China is an area of contact among Turkic, Mongolic, Bodic, and Sinitic languages. Historically, it was an area of Silk Road trade, but also an area of conflict as various groups migrated in and out of the region and competed for control. In the Qinghai-Gansu (Amdo) Sprachbund, languages from all four groups have converged in morphosyntactic, phonological, and lexical aspects. As Mongolic and Tibetan speakers acquired Northwest Mandarin centuries ago for trade and through intermarriage, local Sinitic varieties began to emerge which shifted to OV word order, developed case, number, and tense-aspect morphology, and reduced or lost tone (see, e.g., Dwyer, 1992, 1995; Peyraube, 2017; Sandman, 2021; Zhu et al., 1997). A large number of Turkic speakers shifted to Mongolic in the 13-14th centuries, when the Mongol empire ruled China, which shaped the early development of local Mongolic varieties like Santa (Field, 1997, p. 7ff.). Increased bilingualism with Mandarin in recent generations has brought many Sinitic loans and constructions into the other languages (Field, 1997; Slater, 2003).

Mangghuer, spoken in this region, was once considered a true 'mixed language' (Slater, 1998), though more recent analysis sees it as identifiable as still clearly Mongolic (Slater, 2003). In some of its constructions for temporal sequence, Mangghuer uses the spatial terms *mieshi* 'front' and *khuonuo* 'back' (see (4) and (5)), indicating a spatio-temporal metaphor using the front-back axis.

(4) Mangghuer: ji-shi-nian=sa **mieshi**
several-ten-year=ABL front
'many years ago/several decades ago' (Chen et al., 2005, p. 71)

(5) Mangghuer: ning-sa **khuonuo** zui **khuonuo**
this-ABL behind most behind
'after this' 'at last, finally' (Chen et al., 2005, p. 23, 25)

Bao'an Tu (Mongguor), another Mongolic language, shows evidence of front-back temporal metaphor with phrases involving the items *ŋamada* 'behind/after,' *kuda* 'front/before,' *ɛintɛhada* 'behind/after,' and *jantɛhada* 'front/before,' as in (6) to (8).

(6) Bao'an Tu: ɲəntoχlak^{h}a att^{h}ogə **ŋamada** nat^{h}ə-tɛo
Nianduhu.Laka most behind dance-IPFV.OBJ
'Nianduhu Laka village dances very last' (Fried, 2010, p. 335)

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Table 3. Summary of results

	Front-back?	Morphemes	Lexical transfer?	Metaphor transfer?	Up-down?	Morphemes	Lexical transfer?	Metaphor transfer?
Northwest								
Mangguer	Yes	Native	No	No	No	–	–	No
Bao'an Tu	Yes	Native	No	No	No	–	–	No
Santa	Yes	Native and borrowed	Yes	No	No	–	–	No
Salar	Yes	Native	No	No	No	–	–	No
Uyghur	Yes	Native	No	—	No	—	—	No
Sibe	Yes	Native	Yes	No	No	–	–	No
Khalkha Mongolian	Yes	Native	No	No	No	—	—	No
Wutun Chinese	Yes	Native	No	No	Yes	Native	No	No
Xunhua Chinese	Yes	Native	No	No	Yes	Native	No	No
Northeast								
Japanese	Yes	Native and borrowed	Yes	Hard to say	Yes	Borrowed and native	Yes	Probably
Korean	Yes	Native and borrowed	Yes	Hard to say	Yes	Borrowed and native	Yes	Probably
Manchu	Yes	Native	No	No	No	—	—	No
South								
Vietnamese	Yes	Native	No	—	No	—	—	No
Hmong	Yes	Native and borrowed	Yes	Maybe	No	—	—	No
Tsou	Yes	Native	No	Maybe	No	—	—	No
Kavalan	Yes	Native	No	No	No	–	–	No
Paiwan	No	–	–	No	No	–	–	No
Qiang	Yes	Native	No	No	No	—	—	No

(7) Bao'an Tu: ənə **ɕintɕhada** da ənə tɕə sutə=ku
this behind also this go stay=IPFV.NMLZ
'And after this he will want to keep doing this, and…' (Fried, 2010, p. 234)

(8) Bao'an Tu: tɕaŋgo-tɕə da thəŋgə-ke-sa ənə 'liuyuehui' ənda thər
think-IMPF also that-put-COND this 'liuyuehui' here that
jantɕhada wa
in.front.of COP.OBJ
'Given that, this *liuyuehui* was here before that.' (Fried, 2010, p. 234)

Santa, another Mongolic language spoken in Gansu and also further northwest, uses similar front-back expressions with *meliə* 'front/before' and *quəina* 'back/after' (see (9)). It also has a construction with a borrowed form of Chinese *yǐhòu*, as in (10).

(9) Santa: dɑgɑi liuʂi niɑn-sə **meliə**, bidʑiən-ni duŋxiɑŋ
probably sixty year-ABL front 1PL.EXCL.NOM.-ASSOC Santa-GEN
ərə kuŋ-lɑ piɕiə piɕiə-liə=nə
male person-PL waistband wear.a.waistband-VS=IPFV
'From probably sixty years ago, we Santa men have been wearing waistbands.' (Field, 1997, p. 348)

(10) Santa: xuɑi dʑiərə qɯri i**xəu**, sudoro sɑu-ʁɑ
kang on go.up after inside sit-CAUS
'After [they] go up on the kang, [I] make [them] sit inside.' (Field, 1997, p. 362)

There are plenty of Sinitic loanwords in these languages – for example, *ji-shi-nian* and *zui* in the Mangghuer examples, and *dagai liuʂi nian* and *ixəu* in Santa. However, there is no clear evidence that the conceptual metaphor itself was transferred from Sinitic. Front-back time metaphors are attested across the Mongolic family, including in varieties that have had much less bilingualism with Chinese until very recently. For example, in Khalkha Mongolian, *ömnö* covers both 'before' and 'in front of' (cf. Santa *meliə*) and *xoyno* is 'behind/after' (cf. Mangghuer *khuonuo*, Santa *quəina*) (Lubsandorji & Vacek, 2004). Dagur Mongolian in the northeast uses the morphemes *emele* and *huaine* similarly (Martin, 1961). This indicates that the metaphors are inherited from Mongolic ancestor languages, not borrowed through contact.

The sources I consulted did not contain any evidence that these languages use the up-down axis in temporal constructions. The only instance of 'last' or 'next' that appeared in the collection of Mangghuer folktales used *mieshi* 'front' for 'last' (see (11)). Khalkha Mongolian uses 'back' for 'next year' and a Moving Time schema for 'last year,' as in (12).

(11) Mangghuer: **mieshi**-hui
front-instance
'last time' (Chen et al., 2005, p. 28)

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(12) Khalkha: onggeregsen jil **qoyitu** jil
past year back year
'last year' 'next year' (Poppe, 2006, p. 110)

Salar, a Turkic language spoken in the Qinghai-Gansu Sprachbund, also employs a front-back metaphor for time, using *ardʒi* for 'behind, after' and *ili* for 'front, before' (Dwyer, 2007). The Salar term for 'afternoon' is *ojlie soŋ-i* 'noon bottom/end-3POSS.' While this construction shares some similarity with Mandarin *xiàwǔ* 'down-noon,' the temporal use of *soŋ* 'bottom/end' actually reflects Salar's connection with Western (Oghuz) Turkic – cf. Turkish *öğleden sonra* 'afternoon') – and probably does not reflect an up-down time metaphor. According to Dwyer, the root originally meant 'the end (of something)' and was extended later to mean 'bottom' or 'behind.'

Amdo Tibetan, a Sino-Tibetan language that is widely spoken in the Qinghai-Gansu Sprachbund, also has words with both front-back spatial meanings and temporal uses. In Amdo, *sngonna* means 'in front' and 'before,' while *gzhugna* means 'behind' and 'after' (Dpal, 2016).

The Sinitic languages spoken in this region have been significantly restructured through contact with Altaic and Tibetan languages, to the extent that some have been classified as 'mixed languages' (Zhu et al., 1997). Temporal expressions using both spatial dimensions are attested in at least some of the descriptions. Example (13) shows a front-back expression from the Chinese variety spoken in Xunhua, Qinghai Province (cf. Mandarin *zuìhòu*). The variety spoken in Tangwang also has the expected front-back expressions related to *qián* and *hòu* (Xu, 2017), and Gangou Chinese has *hòu* for 'later' (Zhu et al., 1997).

(13) Xunhua: dʐə^{55}gə ʂɚ^{55} t^{h}a zui^{55} **xeu^{3}** xã^{13} ʂə^{53} pu^{55} dʐɚ^{13}dɔ^{53}
this-CL matter he most later still COP NEG know
'Later he won't know about this matter' (Dwyer, 1995, p. 166)

In descriptions of other local Sinitic varieties, the typical Sinitic time metaphors are not as clear. In the Wutun variety, for example, the temporal adverbs *godangma* and *wuzizi*, both meaning 'before, earlier' (Sandman, 2016, p. 171), are not cognate with the *qián* terms attested elsewhere in Sinitic. Wutun has typical Sinitic spatial terms *qanmian* 'in front of' and *bimian* 'behind' (cf. Mandarin *bèimiàn*, synonymous with the spatial sense of *hòumiàn*), but they do not appear in any of the temporal expressions in Sandman's description (see (14) to (16) for the 'after' expressions).

(14) Wutun: se-gu-lio jera
die-COMPL-PFV after
'after he had died' (Sandman, 2016, p. 86)

(15) Wutun: gu-de xenrada yidaze wu-dai-yang
that-ATTR after all five-month-festival
go-she-di-de re
spend-RES.AO-PROGR-NMLZ FACT
'After that, everyone spends the May Festival' (Sandman, 2016, p. 360)

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(16) Wutun: wu-dai-yang-de co lek-yai-he yek-de
five-month-festival-ATTR after six-month-festival exist-ATTR
re da
FACT then
'After the May Festival, there is the Leru Festival' (Sandman, 2016, p. 359)

As explained above, though, the Mongolic and Turkic languages spoken in this region use the front-back axis for time. It seems unlikely that contact would lead the local Sinitic varieties to lose the mapping altogether. Sandman does not mention the etymology of *jera*, *xenrada*, and *co*, so I am not sure if they derive from 'back/behind' constructions or if they are strictly temporal terms.

The up-down axis, on the other hand, is not used for time in any of the non-Sinitic languages. One might wonder, then, if the local Sinitic varieties have lost this mapping under contact with languages that do not have it. From the evidence in the sources consulted, it seems likely that they have retained it. Example (17) shows an up-down expression in Xunhua Chinese (cf. Mandarin *xiàge lǐbài*), and Wutun Chinese has the word *xongwu* 'afternoon' (Sandman, 2016, p. 218), which is cognate with Mandarin *xià-wǔ* ('below-noon').

(17) Xunhua: **ɕja**^{55} gə li^{53}bei^{55} ŋə^{53} bu^{42} xuəi^{13}tɕ^{h}i^{55} liɔ
below CL week I NEG return go PERF
'Next week I won't go home' (Dwyer, 1995, p. 164)

The Turkic language Uyghur is spoken further west, in what is officially called the Xinjiang Uyghur Autonomous Region of China, but also known as East Turkestan or simply 'the Uyghur region'. For Uyghur, intense contact with Sinitic began relatively recently. It was not until the second half of the 20th century that many Han Chinese began to immigrate (Baki, 2012). Most Uyghurs were not bilingual in Mandarin until recent decades, and the number of Han Chinese migrants who would have learned Uyghur was fairly small.

Similar to the Mongolic languages, Uyghur uses front-back morphemes in temporal constructions – *ald* 'front,' *burun* 'nose; before,' and *keyn* 'back.' The combination of future-facing ego and Moving Time units with fronts and backs is the same as Chinese (both orientations are exemplified nicely in a single sentence in (19)), and the syntax is similar with the 'front' and 'back' words at the end of a preposed temporal clause. However, the constructions go back to Old Turkic (Erdal, 2004) pointing to origins unrelated to contact with Chinese.

(18) Uyghur: men söz bashla-sh-tin **burun**
1SG word begin-GER-ABL before
'Before I even started talking, …' (Tarim, 2016)

(19) Uyghur: biz birqanche yil-din **këyin** **keyn**-imiz-ge burul-up
we a.few year-ABL back back-PL-DAT turn-CNV
'when we look back a few years later' (Erkin, 2013)

Uyghur does make some use of up-down imagery for time, employing *bash* 'head' and *ayagh* 'foot' in expressions like those in (20). While there is some similarity to the

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Sinitic use of 'head' and 'base' (*yuè tóu*, *yuè dǐ* in Table 2), it is unlikely that the constructions were transferred, as they are also used in other Turkic languages that have had little or no contact with Sinitic (cf. Kazakh *törtinşi aydıñ basında* 'at the beginning of the fourth month,' *sekseninşi jıldardıñ ayağında* 'at the end of the 80s'). Uyghur also uses *bash* 'head' and *ayagh* 'foot' in verbal forms like *bashlimaq* 'to begin' and *ayaghlashmaq* 'to finish.' The 'head' verbs go back to Old Turkic, and to my knowledge, these specific uses of 'head' and 'foot' are not found in the Sinitic languages.

(20) Uyghur: üch-inchi ay-ning **bésh**-i
three-ORD month-GEN head-3POSS
'early March' (Uyghur Projects Foundation, forthcoming, C1, speaker 1)

toqsin-inchi yil-lar-ning **ayigh**-i-da
90-ORD year-PL-GEN foot-3POSS-LOC
'at the end of the 90s' (Oyghan, 2017)

Uyghur does not use the up-down axis for any of the expressions where Sinitic languages do, employing either front-back terms as in (21) or Moving Time expressions.

(21) Uyghur: **aldin**-qi hepte **kéyin**-ki hepte ich-i-de
front-ATTR week back-ATTR week inside-3POSS-LOC
'last week' (Irade, 2018a) 'in the next week' (Irade, 2018b)

Sibe is a Tungusic language originally from Manchuria but currently only spoken in the northwest of the Uyghur region. Sibe speakers were transferred there to resettle the area after the Qing empire's genocide of the Dzungar population in the 1750s. In Sibe, the word *amaɹ* in (22) comes from the root *ama* 'back,' but the corresponding root *jule* 'front' is not typically used for 'before.' Instead, we see *onoɹ*, a borrowing from Mongolian, as in (23). However, the 'front = before' mapping survives in a few fixed forms, such as ***julge**-i fon-de* 'long ago, once upon a time' (front-GEN time-DL) (Zikmundová, 2013).

(22) Sibe: 1:ər Nan ji-ɣ **amaɹ** śiñi ər baitə-f sa-ʁəi.
this person come-PFV.VN after only this matter-ACC know-PFV
'I have learned about the whole thing only after he came.'
(Zikmundová, 2013)

(23) Sibe: yavə-r onoɹ bo-d ňi əmda døš-či
go-IPFV.VN before house-DL POSS once enter-COND.CVB
o-m ba?
become-IMPF PROB
'What about going to see him once before you leave?' (Zikmundová, 2013)

To summarize, front-back time metaphors are common in the languages of the Qinghai-Gansu Sprachbund. However, while there is some lexical borrowing, there is no clear evidence for transfer of the metaphor. Additionally, none of the non-Sinitic

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languages here use up-down temporal constructions that could be traced to contact with Sinitic. The same is true for Uyghur and Sibe, spoken farther west.

3.2. The Northeast

To the northeast, Japanese and Korean had many centuries of contact with Chinese. The practice of writing was learned from the Chinese, and Classical Chinese was used as a high-status register for government and scholarship. While Japanese and Korean speakers eventually developed orthographies more suitable for their own languages, written Chinese was in use through the 19th century in Korea, and heavily Sinicized formal registers of Japanese were in use well into the 20th century (Loveday, 1996).

In Section 2.2, above we saw that the Sinitic languages use the up-down axis in expressions for 'next' and 'last,' for parts of the month, and for 'morning' and 'afternoon.' Japanese and Korean both use the up-down axis for time. Both have borrowed temporal expressions with the Chinese morphemes *shàng* and *xià*. Here, we see the strongest case for metaphor transfer among the languages surveyed for this paper.

In Japanese, the month can be divided into the first third, middle third, and last third using *jō* 'up' and *ge* 'down,' as in (24). Similar expressions are used for volumes of books in a series and sections of poems. These terms are borrowed from Chinese and are written with kanji. *Jō* and *ge* are quite different phonetically from Chinese *shàng* and *xià*, but they are indeed Sino-Japanese pronunciations of the kanji characters 上 and 下 (cf. 上下 *jōge* 'up and down; above and below'). Versions of the poem terms also exist with native Japanese morphemes *kami* 'up' and *shimo* 'down' instead of *jō* and *ge* (Nelson, 1962).

(24)	Japanese	**joo**-jun (上旬) up-10.days 'first third of the month'	chuu-jun (中旬) middle-10.days 'middle third'	**ge**-jun (下旬) down-10.days 'last third' (Radden, 2011, pp. 6, 7)
		jou-kan (上巻) up-scroll 'first volume' (Radden, 2011, pp. 6, 7)	chuu-kan (中巻) middle-scroll 'middle volume'	**ge**-kan (下巻) down-scroll 'last volume'
		jō-ku (上句) up-sentence 'first part of a poem'		**ge**-ku (下句) down-sentence 'last part of a poem' (Nelson, 1962)

Similar terms for parts of the year also involve the up-down axis, as in (25). The constructions here are from Chinese *shàngbànqī* 上半期 and *xià(bàn)qī* 下(半)期, and are written with these characters (Nelson, 1962), but in spoken form the initial morphemes are the native Japanese morphemes *kami* and *shimo*.

(25)	Japanese	***kami**-han-ki* (上半期) up-half-period 'first half of the year'	***shimo**-(han)-ki* (上半期) down-half-period 'second half of the year' (Radden, 2011, pp. 6, 7)

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The morphemes *jō* and *ge* are also associated with up-down spatial orientation, as in (26). Borrowed Chinese *xià* is also pronounced *ka*, as in *kakō* 'descent, fall, drop' (下降) and *kahō* 'lower part' (下方).

(26) Japanese

jō-han-shin (上半身)	**ge**-san (下山)
up-half-body	down-mountain
'upper half of body'	'descend a mountain'
jō-ge-dō (上下動)	**ge**-dan (下段)
up-down-move	down-step
'vertical motion (in earthquake)'	'lower tier' (Nelson, 1962)

For 'next' and 'last,' Japanese also uses borrowed Sinitic morphemes, but the terms do not use the up-down axis. 'Last month' is *sen-getsu* ('first-month,' cf. Chinese *xiān yuè* 先月), 'last year' is *kyo-nen* ('go-year,' cf. Chinese *qù nián* 去年), and 'next year' is *rai-nen* ('come-year,' cf. Chinese *lái nián* 来年).

The examples above in (24)-(26) indicate that a transfer of the up-down time metaphor occurred. Sino-Japanese *jō* and *ge* are used in both spatial and temporal expressions. Further evidence for the transfer comes from the fact that the native Japanese morphemes *kami* 'up' and *shimo* 'down' are also used in temporal expressions. It seems unlikely that the temporal use of the native morphemes existed pre-contact, since in all the temporal expressions I have seen involving *kami* and *shimo*, the other morphemes are clearly borrowed from Chinese. Additionally, a cross-linguistically rare feature like temporal use of the up-down axis is less likely to have originated independently in two neighboring languages than to have transferred through contact.

Korean makes use of the up-down axis via the Sino-Korean morphemes *sang* and *ha*, from Chinese *shàng* and *xià.* Example (27) lists several Sino-Korean words for parts of time units, which come from Chinese *shàng/xiàxún* (上/下旬), *shàng/xiàwǔ* (上/下午), *shàng/xiàpiān* (上/下篇), and *shàng/xiàbànqī* (上/下半期). In addition to these, *se-mit* 'end of the year' (lit. 'year-lower'; Radden, 2011, p. 6) uses native Korean morphemes.

As in Japanese, 'up' and 'down' are not used for 'next' and 'last' in Korean. For these functions, the non-spatial native morphemes *taum* 'next' and *jinan* 'last' are used, as in *taum tal* 'next month' and *jinan tal* 'last month.'

(27) Korean

sang-sun	**ha**-sun
up-10.days	down-10.days
'first third of the month'	'last third of the month'
sang-o	**ha**-o
up-noon	down-noon
'morning'	'afternoon'
sang-pyeon	**ha**-pyeon
up-piece	down-piece
'first volume'	'second/last volume' (Radden, 2011, pp. 6, 7)
sang-bangi	**ha**-bangi
up-half	down-half
'first half'	'second half'

Sang and *ha* are associated with spatial orientation in other Sino-Korean words, such as *sangseung* 'rise, climb, increase,' *hagang* 'descent,' *jiha* 'underground,'

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jihacheol 'subway,' *jihado* 'underpass.' The 'up/down' semantics of *sang* and *ha* are metaphorically extended in other typical ways, as in *hyangsang* 'improvement,' *isang* 'greater than,' and *iha* 'less than.' As in Japanese, then, we have up-down morphemes functioning in both spatial and temporal expressions, so this represents a likely case of metaphor transfer. The metaphor spread through borrowed lexical items and then native morphemes were substituted into borrowed constructions or used to create new items on the model of the Sinitic ones. Metaphor transfer via borrowed words makes sense as the contact primarily involved Japanese and Korean speakers learning Chinese (L2 > L1 transfer); if it had been large numbers of Chinese learning Japanese and Korean (L1 > L2 transfer), the metaphor-based constructions might have been copied even without borrowed words.

Japanese and Korean also use the front-back axis for time, and borrowed Sinitic morphemes are used in some of the relevant expressions, but there is not clear evidence that the mapping itself was borrowed from Sinitic. The borrowed morphemes are used alongside native morphemes for 'front' and 'back' that function in both spatial and temporal domains. For 'after,' Japanese uses the native morpheme *ato* 'back' more colloquially as in (28), but *go* (from Chinese *hòu*) is also used for temporal clauses as in (29) and in some temporal words or phrases like *sono-go* 'subsequently' and *shoku-go* 'after a meal' (Kaiser et al., 2013, pp. 83, 130). Similarly, native *mae* 'front' is used for 'before' more frequently than the Sino-Japanese *zen* (from Chinese *qián*), which occurs mostly in borrowed lexical items like *chokuzen* 'immediately before,' *izen* 'earlier,' or *jizen* 'beforehand' (Kaiser et al., 2013, pp. 232, 495, 631).

(28) Japanese: Shihō shōshō o oeta **ato** wa, Fukui de bengoshi o
legal training OBJ finish back TOP Fukui LOC attorney OBJ
mezasu to iu.
aim QUOT say
'After finishing his legal training, he aims to work as an attorney in Fukui'
(Kaiser et al., 2013, p. 609)

(29) Japanese: Saisho no shibōrei ga Nippon Shōji ni hōkoku sarete
first GEN death SUBJ Nippon Shoji LOC report do
kara nijōninichi-**go** datta.
from 22.days-back was
'It was 22 days after the first death [case] was reported to Nippon Shoji.'
(Kaiser et al., 2013, p. 607)

In Korean, the situation is similar. The Sino-Korean loans *cen/jən* 'before' and *hwu/hu* 'after' (from *qián* and *hòu*) are used alongside the native morphemes *ap* 'front' and *twi* 'back'. The borrowed and native morphemes seem to be used in equally diverse contexts, including doublets like *twi-nnal / hu-nnal* 'at a later date' (Radden, 2011, p. 23) and *sam nyen twi-ey / twu sikan hwu-ey* 'in three years / in two hours' (Haspelmath, 1997, p. 164), and temporal clauses as in (30) and (31). The borrowed form of *qián* also appears in *jənjənal* 'front-front-day; day before yesterday' (Radden, 2011, p. 26).

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(30) Korean: pulaun-ssi-nun hankwuk-ey o-ki-**cen**-ey,
Brown-Mr-TOP Korea-LOC come-NMLZ-before-LOC
'Before he came to Korea, Mr. Brown lived in China.' (Chang, 1996, p. 154)

(31) Korean: yong-i tochakhan **hwu**-ey ku il-ul
Yong-NOM arrive after/next-LOC the work-OM
kyelclengha-psita
decide-FO/PRP
'Let's decide it after Yong arrives.' (Chang, 1996, p. 149)

It is clear that the lexical items for 'front/before' and 'back/after' were transferred from Chinese into both Japanese and Korean. In some instances, the borrowings are individual lexical items whose component morphemes are all Sinitic, like Japanese *izen* 'earlier' (Chinese *yǐqián*) or Korean *hu-dae* 'future generation' (Chinese *hòu dài*). In other cases, especially in Korean, the borrowed morphemes are thoroughly integrated into the grammar, and represent a standard way of expressing that function. Additionally, spatial uses of the morphemes exist in both languages, as in (32).

(32)

Japanese:	zen-bu	kō-bu
	front-part	back-part
	'front'	'back, rear'
Korean:	jen-myeon	hu-myeon
	front-side	back-side
	'front'	'back'

However, considering how common front-back time is cross-linguistically, and also considering that there are native morphemes in both languages that cover both spatial and temporal anterior/posteriority, it is likely that the use of front-back time expressions predated contact with Chinese. If pre-contact stages did not have the mapping, or if related languages not in contact with Sinitic did not have it, we might argue that the constructions with native morphemes were copied from the Chinese model. However, for both Japanese and Korean, there are no written records before contact with Chinese, and there is also no way to compare with closely related languages, since Korean is an isolate and the only relatives of Japanese (the Ryukyuan languages) were also in contact with Chinese. The conclusion, therefore, must be that contact has affected the lexical expression of front-back time, but there is not a strong case for a transfer of the metaphorical mappings.

Manchu, a Tungusic language spoken to the northeast of China, also had intense contact with Sinitic. The Manchu empire ruled China in the 17th-early 20th centuries (the Qing dynasty), but it turned out that Chinese culture and language exerted significant influence on Manchu rather than the other way around. Manchu speakers quickly began shifting to Chinese, and despite maintenance and revitalization efforts, the language has relatively few speakers now (Gorelova, 2002). In Manchu, the front-back axis is partially used for temporal expressions (see (33), and cf. (22) above for Sibe), but there is no evidence of borrowing from Sinitic. I did not find any examples of the relevant expressions for up-down time in the sources consulted for Manchu.

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(33) Manchu: ere gemu muse ba sin-i yabu-ha **amala,**
this all we(INCL) place you-GEN leave-PTCP behind
weile-me šangga-bu-ha
build-CONV finish-PASS-PTCP
'After you had left our place, all this was finished being built'
(Gorelova, 2002, pp. 361, 362)

To summarize, both Korean and Japanese have borrowed Chinese expressions involving both the front-back and up-down axis. The front-back mapping may have been present before contact, but the up-down one can be analyzed as having transferred from Sinitic to both Korean and Japanese. Manchu has a front-back conceptualization of time, but it did not emerge through contact.

3.3. The South

To the south, the region of Vietnam was under Chinese administration from the early second century BCE to the early 10th century CE. Classical Chinese was used as the written language for administration and education, and an adapted system of characters was devised for writing Vietnamese in the 11th century. Massive lexical borrowing from Chinese occurred in several waves; it is likely that the greatest amount of everyday bilingualism happened after Sinitic-speaking immigrants from Fujian and Guangdong moved south into Vietnam in the 17th century (Ngo, 2021).

Vietnamese uses *trước* 'front' and *sau* 'back' for 'before' and 'after,' as in (34) and (35). However, it is likely that the use of the front-back axis for time existed in Austroasiatic before contact with Chinese. Khmer, which belongs to the same branch of Austroasiatic as Vietnamese but has not had significant contact with Chinese, has a 'behind ~ after' mapping in the word *kraoy* (Haiman, 2011, p. 173), which goes back to Old Khmer (Jenner & Sidwell, 2010, p. 38).

(34) Vietnamese: **trước** khi đi việt nam, tôi học tiếng
front when to/arrive? Vietnam I study language
việt một năm.
Vietnamese one year
'Before I went to Vietnam, I studied Vietnamese for one year.'
(Ngo, 2021, p. 214)

(35) Vietnamese: **sau** khi lam việc ở Việt Nam một năm, tôi muốn
back when work in Vietnam one year I want
có cơ hội trở lại đấy lam việc.
have chance return again there work
'After I worked in Vietnam for one year, I'd like to have another opportunity to return there to work.' (Ngo, 2021, p. 214)

In expressions for 'next' and 'last,' Vietnamese does not use the up-down axis, instead making at least partial use of the front-back axis, as in (36).

(36) Vietnamese: tháng **trước** tuần **sau**
month front week back
'last month' 'next week' (Ngo, 2021, pp. 11, 12)

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In contrast with Vietnamese, speakers of Hmong lived in relative isolation in what is now southern China until Chinese settlers moved into their territory in the late 17th century, prompting armed conflict and subsequent migration (Culas & Michaud, 1997, p. 215). Some Hmong speakers migrated to Vietnam starting in the 18th century, to Laos in the 19th century, and Thailand in the 20th (Kunyot, 1984, p. 4). The communities in southern China have had continued contact with Sinitic languages, while those outside of China have not.

The front-back mapping is attested in Hmong varieties spoken in both China and Thailand. In Hmong Njua (Green Miao), spoken in Thailand, the temporal conjunctions are at the beginning of the dependent clause (see (37) and (38)).[1]

(37) Hmong Njua: (Thailand)
pé tûa tsů ndàw nŭa **thảu ndê** kẁ nảng yŭa lů
we come to at this front LNK rain will come
'We reach here before it rains' (Kunyot, 1984, p. 101)

(38) Hmong Njua: (Thailand)
tảo qáng kẁ lûa té lăw té tảng mảng tyảo páo kẁ
back LNK clear field burn field all then plant corn
'After clearing and burning the land, we plant corn' (Kunyot, 1984, p. 101)

Sposato's (2015) description of the variety known as Xong spoken in Hunan and Guizhou provinces of China also shows the use of 'in front of' and 'behind' in temporal constructions, as in (39) and (41), but with notably different syntax. In (39), the clause-linking device is at the end of the temporal clause, as in Chinese, not the beginning, as in Hmong Njua. The overall syntax is exactly parallel to the Mandarin equivalent (see (40)), and it includes equivalent constructions involving the use of 'hold' as an object marker and 'complete' as an aspect marker.

(39) Xong: (Hunan/Guizhou)
Mx beut nggueb naond geud-**neul**
2SG lie.down sleep ASSOC place$_1$-front
lis xank geud zol.niel chauk diul.
want first hold homework do complete
'You need to finish your homework before you go to sleep.' (Sposato, 2015, p. 215)

(40) Mandarin:
nǐ shuìjiào **zhīqián** yào xiān bǎ zuòyè zuò wán
2SG sleep front want first hold homework do complete

(41) Xong: (Hunan/Guizhou)
Geud-**zheit** doul Niaox.nhaonl ox beul naond bod,
place$_1$-back remain (name) and 3 ASSOC husband
'From then on it was just Niao Nhaon and her husband'
(Sposato, 2015, p. 621)

[1]The glosses 'front' and 'back' come from Lyman (1979), p. 24).

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Xong also has a number of front-back time words that are clearly borrowed from Chinese – *ix.houf* from *yǐhòu* 以后 'after,' *ranf.houb* from *rǎnhòu* 然后 'then,' and *zeib.houf* from *zuìhòu* 最后 'final' (note that the final orthographic letter of each syllable indicates tone, not a phonetic segment). The construction in (42) parallels the Mandarin construction *liáng-sān-niǎn yǐhòu* 两三年以后 'two-three-year later.'

(42)	Xong:	Oub-bub-jut	**ix.houf**	mex	leb	deb-deb.	
	(Hunan/Guizhou)	two-three-CL:year	**later**	exist	CL	child-RED	
		'Two or three years later (they) had a child.' (Sposato, 2015, pp. 601-602)					

Heal's (2020) sketch of a Hmong variety known as Mashan Miao, spoken in southern China (Guizhou), includes few examples of temporal expressions, but it appears that this variety has borrowed the morpheme *hòu* 'after' from Chinese as *hob* (recall that the *b* here represents tone, not a phonetic segment). The construction at the end of the sentence also uses *hob*, and while the free translation reflects a more natural English syntax, the Hmong seems to involve a temporal clause ('…after returning, came to the house'). In (44), the temporal adverbial *at hob* 'after' looks like a possible borrowing of Chinese *yǐhòu.*

(43)	Mashan Miao:	nongx	**hob**,	lenx	dongb	deib	bid	mis
	(Guizhou)	day	**after**	CL	child	POSS	father	mother
		tas	**hob**	loul	biaed			
		return	after	come	house			
		'The next day, the child's parents returned home.' (Heal, 2020, p. 62)						

(44)	Mashan Miao:	**at hob**,	baeb	mux	neis angt xid	hliah
	(Guizhou)	**after**	1PL	NEG	be.angry	EXP
		'After, we didn't fall out again.' (Heal, 2020, p. 20)				

'Front' and 'back' in Heal's description are *nzouk ndaek* and *nzouk huob*, respectively. It is not clear to me whether they are native morphemes (perhaps cognate with Xong *geud-neul* and *geud-zheit*) or borrowed, or whether they are used in any temporal constructions.

Considering expressions where Sinitic languages use the up-down axis, the Hmong Njua terms for 'next' and 'last' do not reference either spatial axis (see (45)). 'Last month' involves a Moving Time metaphor, but 'next month' does not appear to. None of the available data for 'afternoon,' 'morning,' and parts of the month suggest borrowing from Chinese, either in the lexical items or the conceptual structure.

(45)	Hmong Njua	lú hli	tảng	lů	lw̃	lú hli
	(Thailand)	month	all	come	next	month
		'last month'		'next month'		
		(Kunyot, 1984, p. 106)		(Kunyot, 1984, p. 68)		

For Qiang, which comes from the Burmo-Qiangic branch of Sino-Tibetan and is spoken in southwest China, contact with Sinitic was attested in ancient times, but

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widespread bilingualism was limited to the last century. Historically, only men who left their home villages for work needed to learn Chinese (and one assumes very few Chinese would have learned Qiang), but since the mid-20th century, most Qiang people have begun shifting to Mandarin (LaPolla & Huang, 2008, pp. 3–5).

In Qiang, 'before/after' temporal clauses do not use the front-back axis, but 'front' and 'back' are used for adverbials meaning 'long ago' and 'afterwards,' and also in at least some expressions for 'next' and 'last,' as examples (46) to (49) demonstrate. The 'front/back' morphemes do not appear to be borrowed from Chinese *qián* and *hòu.* The item *tɕi-steke-le* 'the last one' in (49) is parallel to Chinese 最后一个 *zuì hòu yígè* 'most back one-CL,' that is, 'last,' and the morpheme *tɕi* 'most' could conceivably be a borrowing of Chinese *zuì* 最 'most'. Modern Mandarin also uses adverbs involving *qián* and *hòu* for 'before/long ago' and 'later,' but the morphological structure of the Qiang words (e.g., *steke-ta* behind-LOC 'later' [LaPolla & Huang, 2008, p. 113], *qeːˈ-ŋuəɳi* before-TOP 'earlier, before,' [p. 73], *qeːˈ-ta* front-LOC 'in the past' [p.171]) does not match the structure of the corresponding Mandarin words.

(46) Qiang: **qe: ˈ-qeːˈ** ŋuə-tu, tsisatʂů jə-zi ŋuə-kəi-wɑ
front-front COP-LNK sisters two-CL COP-NAR-EMPH
'Long, long ago, there were two sisters.' (LaPolla & Huang, 2008, p. 275)

(47) Qiang: **steke** ɳi:-epə-te:-tɕ gueˈ-ŋuəɳi nə-qəti
behind 3SG.REFL-father-DEF:CL-GEN army-TOP DIR-beat.to.death
dɑ-s.
DIR-finish
'Later the father's army was beaten to death' (LaPolla & Huang, 2008, p. 315)

(48) Qiang: **qəːˈ**-la-ɕ **steke**-la-ɕ
front-DEF:one-month back-DEF:one-month
'last month' 'next month' (LaPolla & Huang, 2008, p. 379)

(49) Qiang: tɕi-**qəːˈ**-le: tɕi-**steke**-le:
most-front-DEF:CL most-back-DEF:CL
'the first one' 'the last one' (LaPolla & Huang, 2008, p. 64)

In Taiwan, the indigenous languages represent great diversity, with 20 or so languages constituting nine of the ten primary branches of the Austronesian family. (The other branch, Malayo-Polynesian, contains the other 1200+ languages of the family). Speakers of the indigenous languages had no contact with Sinitic until Hokkien (Southern Min) and Hakka speakers from the Fujian region of the Chinese mainland arrived in the 17th century (Lin, 2015). Migration to Taiwan was subsequently banned for almost two centuries until the end of the Qing dynasty, leaving a relatively self-contained contact situation. It was not until the second half of the 20th century (after 50 years of Japanese control) that Mandarin entered Taiwan *en force.* Most of the indigenous peoples are now shifting to Taiwan Mandarin, but this is a recent development.

Lee (2016) gives a detailed analysis of the expressions and concepts for temporal relations in Kavalan, and briefly surveys six other related languages. Among them, several use spatial dimensions in conceptualizing time, but others do not. Kavalan

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uses 'in front of/behind' for 'before/after' with nominal time referents, including nominalized verbs (see (50) and (51)).

(50) Kavalan: **ngayaw** na banged dasidas ya lazing
front GEN typhoon flat NOM sea
'Before the typhoon, the sea was flat (calm).' (Lee, 2016, p. 63)

(51) Kavalan: **tuRuz** na ni-qa-suRaw-an-ku, mawtu tina-ku
back GEN PFV-IRR-fall-NMLZ-1SG.GEN come.AF mother-1SG.GEN
'After I fell, my mother came.' (Lee, 2016, p. 66)

Isbukun Bunun also uses the front-back axis for time, as in (52) and (53).

(52) Isbukun Bunun: Mais ma-pataz kata mas babu tu
when.NPST AF-kill 1PL.NOM OBL pig ATTR
tan-a-**ngaus** hai, asa tu luhusun
region-LNK-front TOP must ? be.tied.up
'Before we kill a pig, it must (be) tied up.' (Lee, 2016, pp. 121, 122)

(53) Isbukun Bunun: Tai-uan masa s<in>aipuk mas Lipuun tu
Taiwan when.PST <PST>rule by Japan COMP
tan-**kinuz** hai, saipuk-un-in mas Tauluu.
region-back TOP, rule-PF-PERF by China
'Taiwan was ruled by China after being ruled by Japan.'
(Lee, 2016, p. 127)

Three other Taiwanese languages have an asymmetry in their use of spatial terms in temporal constructions. For Tsou, Pan (2007) reports variation between speakers in the use of spatial terms in temporal constructions. Tsou uses the specifically temporal markers *n'a/na'a* or *auyu* 'firstly, at first' and *-epungu* 'finish' for 'before/after' clauses. With nominal time referents, the spatial terms *tan'esi* 'here, in front of' and *ta'esi* 'there/behind' can be used as alternatives to the specifically temporal *auyusi* 'first, early' and *ataveisi* 'at last, finally,' as in (54) and (55). However, while all the speakers for Pan's study accepted the temporal use of *ta'esi* for 'after,' the use of *tan'esi* for 'before' was only acceptable for speakers living in the town of Tfuya, while speakers in three other locations did not accept it as grammatical (Pan, 2007, p. 88). In the languages Amis and Puyuma, on the other hand, 'front' constructions are used for 'before,' but 'finish' constructions for 'after' (Lee, 2016). Saisiyat, Rukai, and Paiwan, three other Austronesian languages of Taiwan, are not reported to have any spatial constructions for 'before/after.'

(54) Tsou: ta-'u-n'a eon ta lalauya ta {**tan'esi** / auyusi}
IRR-1SG-ASP live(AF) OBL Lalauya OBL in.front.of / early
no hofngaho'a ta onsoha maitan'e
OBL spring OBL one.year now
'I will be living at Lalauya before this spring.' (Pan, 2007, p. 86)

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(55) Tsou: ta-'u mongoi ta lalauya no {**ta'esi** / ataveisi}
IRR-1SG leave(AF) OBL Lalayua OBL behind / finally
no co-no-feohʉ
OBL one-OBL-moon
'I will leave Lalauya in one month.' (Pan, 2007, p. 101)

This variation might be evidence that these languages did not historically use the front-back axis for time, but they are beginning to do so now under increased contact with Taiwan Mandarin. If that is so, it would be a case of metaphor transfer in progress. On the other hand, as each of these languages comes from a different primary branch of Austronesian, the variation could simply be due to diversity within the family. Even if the front-back metaphors emerged independent of Sinitic contact, though, the extension of *tan'esi* 'in front of' to match the temporal use of *ta'esi* 'behind' in Tsou has probably been facilitated by contact with Mandarin (Pan, p.c.).

Looking at the up-down axis, there is no evidence of transfer from Sinitic. Expressions for 'last month' and 'next month' in Tsou use the terms *auyu* 'first/early' and *faova* 'new' (Pan 2007, p. 69). In Kavalan, while *lipay* 'week' is borrowed from Chinese, the construction for 'last week' uses a term for 'day before yesterday,' (see (56)), which is unlike the Sinitic construction.

(56) Kavalan: (ta) nawsiRab lipay tanian=isu?
LOC day.before.yesterday week where=2SG.NOM
'Where were you last week?' (Lee, 2016, p. 52)

Finally, Wulai Atayal actually has the opposite up-down mapping from the Sinitic languages. The spatial term *zik* 'below' is used for 'before,' and *βaβaw* 'above' for 'after.' Moreover, the expressions employing this up-down mapping are similar to the ones where Sinitic languages use the front-back axis. For example, *zik* is used in expressions for 'the day before,' 'two days in advance,' and also in 'before' clauses (Lee, 2016, p. 128).

To summarize, Vietnamese, Hmong, and Qiang all use the front-back dimension for time, but none of them borrowed the metaphorical mapping from Sinitic. The time expressions in Hmong varieties spoken in China show considerable lexical borrowing and syntactic restructuring, but the front-back mapping is attested in the Thailand variety that has had less contact with Sinitic. In Taiwan, several languages do not use the front-back dimension in temporal expressions, but others do. This represents potential evidence for metaphor transfer via contact with Taiwanese or Taiwan Mandarin. None of the languages surveyed in this section use the up-down dimension for time, except for Wulai Atayal, whose mapping is the opposite of the Sinitic one and thus does not constitute evidence of convergence.

4. Discussion

This survey of three regions of the Sinosphere has briefly described spatio-temporal metaphors in languages from the Mongolic, Turkic, Tungusic, Japonic, Korean, Hmong-Mien, Austroasiatic, Austronesian, and of course Sino-Tibetan families, many of which have not been discussed previously in the literature on conceptual metaphor. Table 3 above (Section 3.1) summarizes the findings of the study. Examining these languages in areal context revealed evidence for metaphor transfer

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involving the up-down dimension from Sinitic to Japanese and Korean, contact-facilitated extension of metaphor involving the front-back dimension in Tsou, and possible transfer of the front-back metaphor to several other languages of Taiwan. Several of the lexical items used in front-back metaphorical expressions in Santa, two Hmong varieties, Japanese, and Korean are borrowed from Sinitic, but these do not clearly represent transfer of the conceptual mapping. Other spatio-temporal metaphors are very clearly inherited from ancestor languages, such as the front-back structures in Mongolic and Turkic. As the up-down metaphors do not appear in Qiang or Amdo Tibetan, they may go back to proto-Sinitic, but probably not to proto-Sino-Tibetan.

In terms of explaining the patterns of transfer, in some cases we can point to the nature and duration of language contact as a factor in facilitating the transfer of conceptual metaphor. The ideal environment for transfer is a situation of sustained, widespread bilingualism. Japanese and Korean had extended periods of contact in which at least certain groups in society used Chinese regularly. It makes sense, then, that these are the languages with the clearest case for transferred spatio-temporal metaphors. Other languages had less sustained bilingualism historically, and it is unsurprising that no evidence of metaphor transfer was found in them.

On the other hand, it is somewhat surprising that no transfer of metaphorical mappings or even lexical items related to time was observed in Vietnamese, which had a prolonged history of contact with Sinitic and has imported Sinitic vocabulary on a scale comparable to Japanese and Korean. In the Qinghai-Gansu Sprachbund too, considering the widespread bi-/multilingualism and the amount of phonological, morphosyntactic, and lexical convergence among unrelated languages, it is somewhat surprising that there was not more evidence of contact-related influence on the temporal expressions. As with any aspect of language change, though, there will always be an element of unpredictability in how and when bilingual speakers transfer features of one language to another, and which features they end up transferring.

Looking ahead to future research, most communities of the languages located within China or Taiwan are currently undergoing increasingly intense pressure to become bilingual, if not shift entirely to Mandarin. In an extreme example, Uyghur speakers have been targeted by a cultural and political assimilation campaign involving mass incarceration in re-education camps in which detainees are forced to study Mandarin and Communist Party doctrine, and Uyghur language has been removed from all educational and administrative functions in the region (see, e.g., Hayes, 2019; Smith Finley, 2021; Zenz, 2019). If these languages survive the next few generations of socio-political pressure, it will be interesting to re-examine the situation again and see if any further metaphor transfer has occurred.

The results of a study like this one, which is based on linguistic expressions attested in various languages, provides initial evidence that certain metaphorical mappings existed in the minds of some speakers at some point in time. It is not proof that such cognitive structure exists in the mind of every individual who speaks the language currently. However, it can generate hypotheses to be tested in follow-up work, such as psycholinguistic experiments, gesture studies, etc. The data presented here suggest that Japanese and Korean speakers might perform similarly to Mandarin speakers on priming tasks involving the up-down axis such as those used in Boroditsky (2001). Monolingual speakers of Wulai Atayal, whose up-down mapping is the opposite of Chinese, might show opposite trends. Atayal–Mandarin bilinguals would presumably have access to both mappings, and could show evidence of either stable, separate

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cognitive systems or transfer in one direction or the other. Tsou speakers who do not accept the use of 'in front of' in temporal expressions might be expected to perform differently from speakers who do find such usage acceptable. Finally, this paper represents a first pass over the contact situations surveyed herein; further on-the-ground work very well may reveal more instances of transfer than were identified here. I look forward to seeing these questions pursued in further research.

List of Abbreviations

1	first person
3	third person
ABL	ablative
ACC	accusative
AF	agent focus
ASP	aspect marker
ASSOC	associative
ATTR	attributive
CAUS	causative
CL	classifier
CNV	converb
COMP	complementizer
COMPL	completive
COND	conditional
COP	copula
DIR	directional prefix
DL	dative-locative
EMPH	emphatic particle
FACT	factual
FO	formal
DAT	dative
DEF	definite marker
EXCL	exclusive
EXP	experiential aspect
GEN	genitive
GER	gerund
IMPF	imperfect
IPFV	imperfective
INCL	inclusive
IRR	irrealis
LOC	locative
LNK	linker
NAR	narrative (hearsay) form
NEG	negative
NMLZ	nominalizer
NOM	nominative
NPST	non-past
OBJ	object speaker perspective
OBL	oblique case
OM	object marker
ORD	ordinal
PERF	perfect

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PF	patient focus
PF.PTCP	perfect participle
PFV	perfective
PL	plural
POSS	possessive
PROB	probability/suggestion
PROGR	progressive
PRP	propositive
PST	past
PST3	past tense, type 3
PTCL	particle
PTCP	participle
QUOT	quotation particle
RED	reduplication
REFL	reflexive
RES.AO	agent-oriented resultative
SE	sentence ender
SG	singular
TOP	topic marker
VBLZ	verbalizer
VN	verbal noun

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A. Appendix: spatio-temporal expressions in Sinitic

Note: Mandarin examples use *pinyin* transcription; transcription of other Sinitic languages follows the cited sources.

Table A.1. Adverbs and time units using front-back axis in Sinitic languages

	Mandarin	Taiwanese (Lin, 2015)	Cantonese (Matthews & Yip, 2013)	Wu (Shanghai dialect, Edkins, 1868)	Hakka (Pui Khin Yong, p.c.)
'before, earlier'	yǐ**qián** 以前	í-**chêng**	yíh**chìhn**	'í **zíen**	yi1 **qian2**
'afterwards, later'	yǐ**hòu** 以后	í-**āu**	yíh**hauh**	'í **heu**	yi1 **heu4**[a]
'day before yesterday'	**qián**tiān 前天		**chìhn**yaht 前日	**zíen** nyih 'tsz	**tsien2** ŋit5[b]
'day after tomorrow'	**hòu**tiān 后天		**hauh**yaht 後日	**'heu** nyih	**heu4** ŋit5[b]
'year before last'	**qián**niǎn 前年	**chûn**-nî	**chìh**nnìhn	**zíen** níen	**qian2** nian2
'year after next'	**hòu**niǎn 后年	**āu**-nî	**hauh**nìhn	**'heu** níen	**heu4** nian2

Note: Bold font marks morphemes indicating 'front' or 'back.'
[a]Changting Hakka has *pue-^{5}le^{5}* 'back-?' for 'after' (Kouteva et al., 2019).
[b]Hashimoto (2010).

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Table A.2. Adverbs and time units using up-down axis in Sinitic languages

	Mandarin	Taiwanese (Lin, 2015)	Cantonese (Matthews & Yip, 2013)	Wu (Yiwu dialect, David Chen, p.c.)	Hakka (Pui Khin Yong, p.c.)
'last time'	**shàng** cǐ 上次	**téng** pái 'peak time'	**seúhng** chi	**seung** wei	**song4** bai3
'next time'	**xià** cǐ 下次	**ē**-pái 'below time'	**hah** chi	**wa** wei	**ha4** bai3
'last week'	**shàng** ge xīngqī 上个星期	**téng** lé-pài 'peak week'	**seúhng** go láih baai	**seung** ge li pai	**song4** zak5 sin1ki2
'next week'	**xià** ge xīngqī 下个星期	**āu** lé-pài 'back week'	**hah** go láih baai	**wa** ge li pai	**ha4** zak5 sin1ki2
'morning'	**shàng**wǔ 上午	tàu zà[a] 'noon early'	**seúhng** jau 'above daytime'	ng ga 'noon? ??'	**soŋ4** dzu4[b]
'afternoon'	**xià**wǔ 下午	**ē**-tàu[a] 'below noon' **ē**-bo[a] 'below ??'	**hah** jau 'below daytime'	ng bang 'noon? ??'	**ha1** dzu4[b]
'start of the month'	yuè **tóu** 月头	yuht **tàuh**	yuht **tàuh**	yue **tau**	nyet6 **teu1**
'end of the month'	yuè **dǐ** 月底	yuht **dái**	yuht **méih** 'month tail'	yue **di**	nyet6 **de3**

Note: Bold font marks 'up/down' morphemes. Glosses added for items not cognate with the Mandarin items.
[a]Ya-Hsin Wang (p.c.).
[b]Hashimoto (2010).

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