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# Imperfective aspect in Chinese conversation: do speakers imitate one another's constructions?

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**Abstract:** Speakers constantly align with one another in interaction (Pickering, M. J. & S. Garrod. 2022. Priming, prediction, and the psychological foundations of dialogue. *Language, Cognition and Neuroscience* 37(1). 15–37). They mirror and adjust to what others say to engage cognitively and socially. One common way to do so is through dialogic resonance, that is when speakers re-use the constructions produced by their interlocutors (Du Bois, J. W. 2014. Towards a dialogic syntax. *Cognitive Linguistics* 25(3). 359–410; Tantucci, V. 2023a. Resonance and recombinant creativity: Why they are important for research in Cognitive Linguistics and Pragmatics. *Intercultural Pragmatics* 20(4). 347–376). This paper focuses on how Chinese speakers resonate with one another's imperfective constructions in naturalistic interaction. We found that increasing linguistic material between the resonated and the resonating construction inhibits durative imperfectivity (aspectually vaguer) in contrast with focal imperfectivity (more detailed and time-bound). This suggests that working memory in dialogue does a better job at encoding specific, ongoing phases of an event (*she was just entering the apartment*) rather than generic, durative states (*she lived in that apartment for years*). We found that resonance increases with constructional complexity: the longer the imperfective construction, the higher an interlocutor's engagement with that construction. Information structure also plays a role: imperfectives with transitive or locative objects show a stronger priming effect than objectless imperfectives. Finally, we found sociolinguistic correlations among imperfective construction types, as the postverbal 着 *zhe*, sentence-final 呢 *ne* are used distinctively by Northern speakers, while Southerners show a preference for preverbal 在 *zài* used alone or as part of a larger construction.

**Keywords:** dialogic constructions; resonance; Mandarin; aspect; imperfective

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# 1 Introduction

Speakers normally adapt to one another in conversation and often reuse grammatical structures recently produced by their interlocutors. Similar grammatical structure across speakers is often taken as an implicit phenomenon and referred to as syntactic priming (Branigan 2007; Chang et al. 2000). Priming has been widely studied in experimental settings (cf. Van Gompel and Arai 2018), including recent works on grammatical aspect (e.g., Magliano and Schleich 2000; Golshaie and Incera 2021). It is closely linked to the broader concept of cognitive alignment – understood as the dynamic coordination of mental representations between interlocutors during interaction (Pickering and Ferreira 2008; Pickering and Garrod 2022; Rasenberg et al. 2020). This study examines priming as it occurs in dialogue (e.g., Gries and Kootstra 2017) and focuses on how grammatical structure and meaning jointly influence the way speakers engage with and re-use each other's constructions (cf. Goldberg 2006; Ziegler et al. 2019) – understood as holistic pairings of form and meaning (see Tantucci and Wang 2022a, on constructional priming). More specifically, we explore how speakers re-use each other's imperfective constructions, with a focus on dialogic resonance (cf. Du Bois 2014), a form of structural and functional imitation where speakers re-use and re-adapt the constructions of their interlocutors.

The priming literature on grammatical aspect has mostly centred on the distinction between perfectivity and imperfectivity (e.g., Ferretti et al. 2007; Golshaie and Incera 2021). However, little attention has been paid to how different ways to construe an event aspectually may affect an interlocutor's linguistic behaviour in natural conversation. We investigate imperfectives, examining whether focality – the degree of aspectual salience on an ongoing event (cf. Johanson 2000; Chen 2003) – influences the way speakers (creatively) re-use one another's constructions. We frame our analysis in Dialogic Syntax (Du Bois 2014; Zima and Brône 2015; Tantucci and Wang 2002b) and statistically model speakers' degree of (creative) resonance of in conversation (cf. the Dialogic Categorisation Model, Tantucci 2023a).

The present analysis is centred on Mandarin conversation and whether focal imperfectivity is retained more vividly in working memory than durative imperfectivity. Our assumption is that, as the conversation unfolds and progresses, dialogic resonance of focal imperfectives would decrease less than for durative imperfectives. The reason for this can be found in the cognitive and semantic characteristics of focal imperfectivity. When a speaker uses a construction centred on a distinct moment in which something is happening, that is likely to catch more attention than durative events that are temporally vaguer and more ambiguous. This means that an interlocutor is more likely to be primed for longer by an expression such as *she was just entering the apartment* rather than *she lived in that apartment for years*.

Something similar also applies to the presence of a transitive or a locative object instead of events that would not include that. We assumed that this would also influence the extent to which an imperfective priming construction affects interlocutors' ability or attitude towards re-using it in conversation. This may depend on the amount of salient information encoded by the construction. One thing is to say *I was reading*, another is saying *I was reading Zizek's latest essay that you told me about*.

The paper is structured as follows: Section 2 introduces the notion of aspectual imperfectivity and the way it is expressed in Mandarin Chinese. Section 3 discusses dialogic resonance as an important mechanism of alignment in naturalistic conversation. In Section 4 we describe our data retrieval and annotation scheme. Section 5 is devoted to the statistical analysis of our data. We discuss the relevance and the implications of our findings in Section 6, before concluding in Section 7.

## 2 Imperfective aspect

The imperfective aspect has been traditionally defined as a way to present a situation without its boundaries, focusing on its internal constituency independently from its beginning or end (Janda and Fábregas 2019: 690). In contrast to perfective aspect, which presents an event as a complete whole (e.g., Dahl 1985; Croft 2012), imperfective aspect focuses on the internal structure of an event, highlighting its ongoing nature, habitual recurrence, or extended duration. Because of this internal perspective, imperfective aspect can provide crucial cues about how speakers conceptualise time and action in interaction. Research on imperfective aspect generally follows two approaches:

1) Comrie (1976) views aspect as a categorical concept: it can be either perfective or imperfective. In his view, the perfective aspect refers to the viewing of a situation as a finished or complete whole, without reference to its internal structure. It presents an action or event as finished or complete. Imperfective aspect, on the other hand, involves viewing the event internally, focusing on its duration or repetition without emphasising its completion. Comrie initially distinguishes two types of imperfective:
   a) Habitual aspect: Refers to actions or events that occur repeatedly or habitually over time, but without specifying whether they have ended. It focuses on regular patterns of activity.
   b) Continuous aspect: Refers to actions or events that are ongoing or in progress.

   He further subdivides the continuous aspect into:

   i. Progressive aspect: This denotes actions that are currently in progress or actively unfolding at the moment being described.
   ii. Nonprogressive aspect: This includes ongoing states or activities but without the dynamic sense of progress found in the progressive, who distinguishes imperfectives into habitual and continuous aspects and then divides the continuous aspect into progressive and nonprogressive).

2) Bybee et al. (1994) regard imperfectives as a highly grammaticalised category, representing a further development of the progressive aspect and encompassing various usages.
   a) Progressive: The action is currently unfolding or in progress, similar to Comrie's progressive.
   b) Habitual: Actions that happen regularly or repeatedly, akin to Comrie's habitual aspect. Stative: This refers to the expression of states or conditions that are ongoing but not actions (e.g., *She knows the answer*).
   c) Gnomic: Describes general truths or timeless statements (e.g., *Water boils at 100 °C*).

According to Bybee et al. (1994) model, the imperfective includes progressive, habitual, stative, and gnomic meanings, which form different combinatory subsets in specific languages. However, they also note that no coherent grammatical morpheme types for the continuous aspect were found in their cross-linguistic survey (1994: 139). This somewhat challenged Comrie's aspectual taxonomy, as he did not clarify what exactly is the synchronic and diachronic status of the so-called nonprogressive aspect (cf. Comrie 1976: 25). Bybee et al. (1994) introduced the concept of the resultative aspect, limiting their definition to a continuous state after the completion of an action. According to Chen 2021 the nonprogressive aspect in Chinese corresponds to a so-called broad resultative aspect (Nedjalkov 1983: 6, 7). This, in turn, may develop into a progressive aspect, and further into other usages, becoming a more schematic, non-progressive imperfective. This is illustrated in the Chinese examples (1)–(3), showing the three functions where the actual use of the construction [V 着 *zhe*] is still primarily resultative (cf. Hopper 1991 on persistence) but showing a diachronic trend towards the latter two functions.

(1) 床上挂着蚊帐。

| *Chuáng* | *shàng* | *guà* | *zhe* | *wénzhàng* |
|---|---|---|---|---|
| bed | above | suspend | ASP[1] | mosquito net |

'A mosquito net was suspended over the bed.'

(Jaxontov 1983/1988: 120)

1 Aspectual marker.

(2) 台上正在唱着戏。
*Tái shàng zhèng zài chàng zhe xì*
Stage on just ASP sing ASP opera
'Opera is being sung on the stage'.
(Chen 2021: 324)

(3) 他有着别人所没有的胆识。
*tā yǒu zhe biérén suǒ méi yǒu de dǎnshí.*
he have ASP other people that no have NML[1] courage and insight
'He has the courage and insight that other people don't have'.
(Dictionary Department ed., Dictionary Department 2016: 1592)

In (3) [V 着 *zhe*] is less compositional and more procedural (cf. Terkourafi 2011; Tantucci 2023b) than in (2), as it no longer simply describes the on-going phase of an event, but more broadly instructs the hearer to view the event as an unbounded state that is persisting at some time of reference. This could arguably be categorised as a durative non-progressive function in Comrie's framework, or as a highly grammaticalised imperfective morpheme (originating from a resultative lexical source) in Bybee et al.'s model. Both views of imperfectives are equally valid. This paper is centred on synchronic data and will thus primarily refer to Comrie's terminology. This is primarily a matter of analytical focus: Comrie's framework more clearly foregrounds aspectual distinctions relevant to continuity, whereas Bybee et al. focus on degrees of grammaticalisation, more central to diachronic analyses.

## 2.1 The imperfective aspect in Chinese

Aspect plays a decisive role in Chinese, as it is often described as a tenseless language (cf. Li and Thompson 1989; Smith 1997; Lin 2003). While aspectual marking in Chinese is often optional (Tantucci 2015; Wu 2005), its representation of unbounded events is particularly restricted, due to the interaction between viewpoint aspect and Aktionsart (cf. Vendler 1957). For instance, achievements are not typically marked with imperfective aspect, unlike in Romance and Germanic languages, where such combinations can be quite idiomatic. For instance, expressions like *he is dying* cannot be marked imperfectively in Chinese *他正在死呢 *tā zhèngzài sǐ ne*.[2] This is because 死 *sǐ* 'dying' is an achievement, with inherent endpoint (telos) and no internal duration. Chinese has a rich variety of imperfective constructions, with key syntactic positions and grammatical particles, including:

2 The construction includes the personal pronoun 'he', a preverbal aspect marker, the verb 'die', and a sentence-final particle – also expressing imperfective aspect, as categorised in Table 1.

**Table 1:** Slots coded for imperfectives in Chinese conversation.

| Code | Slot | Example |
|---|---|---|
| A | Temporal Adverbial | 现在 *xiànzài* 'now' |
| B | Preverbal Locative Adverbial[1] | 在那里 *zài nàlǐ* 'over there' |
| C | Temporal Adverb | 正 *zhèng* 'just' |
| D | Preverbal Aspect Marker | 在 *zài* 'be at' |
| E | Postverbal Aspect Marker | 着 *zhe* '-ing' |
| F | Object Argument | 饭 *fàn* 'meal' in 吃饭 *chīfàn* 'have a meal' |
| G | Postverbal Locative | 中 *zhōng* 'inside' |
| H | Sentence Final Particle$_{Asp}$ | 呢$_1$ *ne* |
| I | Sentence Final Particle$_{Mod}$ | 呢$_2$ *ne*/啊 *a* |

The so-called term 'preverbal' or 'postverbal' describes the typical syntactic distribution of a marker, and sometimes it might move to another position due to certain pragmatic factors.

i) The aspect marker 在 *zài* preceding the verb (corresponding to the slot D, as per Table 1), as in 他在吃饭 *tā zài chī fàn* 'He is eating'.
ii) The aspect marker 着 *zhe* following the verb (corresponding to the slot E), as in examples (1–3) in Section 2.1.
iii) The modal particle 呢 *ne* at the end of a sentence (corresponding to the slot H), as in 我写论文呢 *wǒ xiě lùnwén ne* 'I'm writing my thesis (right now)'.

Among these three core markers 在 *zài and* 呢 *ne* are self-sufficient, capable of forming a sentence through diverse combinatory expressions. By contrast, 着 *zhe* on its own does not suffice to indicate the progressive aspect in conversation. Combinability is a key feature of Chinese imperfectives (Xiao and McEnery 2004). Different morphosyntactic combinations may depend on context and interactional needs, such as:[3]

iv. Temporal adverbs before the verb (A), like 现在 *xiànzài*, 'now', as in 他现在就是工作 *Tā xiànzài jiùshì gōngzuò* 'He is working now'.
v. Locative adverbials before the verb (B), 在那里 *zài nàlǐ* 'there' or 在这里 *zài zhèlǐ* 'here', some of which have become grammaticalised with less obvious locative sense and thus can contribute to the expression of imperfective meanings, this is frequent in Southern dialects (Hu 2003), as in 他在那里吃饭 *tā zài nàlǐ chīfàn* 'He's there eating'.
vi. The temporal adverb 正 *zhèng* 'just' before the verb (C) indicates that the action or state continues at the reference time, e.g., 他正犹豫呢 *Tā zhèng yóuyù ne* 'He is hesitating right now'.

**3** Illustrative examples below are taken from our dataset.

vii. Nominal objects.
viii. Locative components following the verb, 中 *zhōng* or 中间儿 *zhōngjiānr* 'in the middle', function similarly to 正 *zhèng* before the verb (G), (我们) 在努力中 wǒmen *zài nǔlì zhōng* 'we are doing our best'.
ix. Sentence-final particles with aspectual meanings (H, SFPs which contribute to tense and aspect values), such as 呢$_1$ *ne*, as in 她在房间里看书呢 *Tā zài fángjiān lǐ kànshū ne* 'She is reading in the room'.
x. Sentence-final modal particles that intensify the tone (I, SFPs which are associated with modality and (inter-)subjectivity), like 呢$_2$ *ne*, 啊 *a*, e.g., 所以你呢? *Suǒyǐ nǐ ne* 'So, what about you?'.

Table 1 will serve as reference for our annotation of all the constructional combinations of imperfectives in our data, including all the conversations occurring in the two spoken corpora of Mandarin telephone conversation, the Callhome and the Callfriend (see Section 4).

## 2.2 Internal dichotomy of Chinese imperfectives

The definition and cross-linguistic identification of imperfective functions such as resultative, progressive, and imperfective (including habitual and generic) – pose significant challenges (Bertinetto et al. 2000; Shirai 1998). This study examines the imperfective aspect in interaction through the lens of focality, defined as the degree of aspectual salience on an ongoing event (Chen 2003: 25; Johanson 2000). While this notion involves a continuum (a view that we endorse), in our study we will address this categorically:

i. **Focalised imperfective aspect**, corresponding to high focalisation.
ii. **Durative imperfective aspect**, corresponding to low focalisation or non-focalisation.

The former (i.) corresponds to the typical progressive aspect, while the latter (ii.), depending on the situation and the context of use, may cover the resultative aspect, progressive aspect, or imperfective aspect. A key difference lies in whether the action is construed as being in progress at some point of reference. Temporal adverbials, temporal adverbs, and postverbal locative components can explicitly indicate this, providing clear clues for annotation. For instance, the [ADV$_{\text{Locative}}$ 在 VP] construction, e.g., *she's here next to me writing a paper often* constrains a focalised interpretation (that would be a holistic combination of B D slots from Table 1). In fact, if the situation denoted by the construction occurs uninterruptedly in a limited timespan, then its imperfectivity is a focalised one. If the situation occurs duratively,

repeatedly, and/or habitually in a relatively broad timespan that could be interrupted, its imperfectivity function is then durative. It may, in other words, comprise internally subdivided states of affairs (cf. Dessì Schmid 2020: 135). This bears similarities with Langacker's distinction between sequential and summary scanning of events (Langacker 2008). An event is conceptualised sequentially when the different facets of the scene are viewed successively (as in a motion picture): *I was just making an omelette.* This entails high focality. By contrast, summary scanning applies when the different aspects of some event(s) are made available holistically, as a single Gestalt: *I made omelettes for years*. Here, the focality on the progression of the event is much lower, and the imperfective aspect is of a durative type. However, there is no perfect equivalence between low focality and summary scanning. Grammaticalised imperfective usages of 着 *zhe* can be used to mark the durative status of some resultative state or even to aspectually encode one's identity, e.g., their Family name, as in 她姓着张 *tā xìng zhe zhāng* 'She is [unalteredly] called Zhang'.

Example (4) below is from our dataset, drawing on the Mandarin Callhome corpus of Telephone Conversation among family members (cf. Section 4) and illustrates an event construed as a focalised one in Chinese conversation:

(4) [Focalised event]

A: 醒了, 正在琢磨心事儿呢。
*Xǐng le, zhèngzài zuómó xīnshìr ne.*
Wake CRS,[4] PROG[5] contemplating concerns $SFP_{Asp}$
'I woke up, I was just contemplating my thoughts (right now).'

B: 想什么心事啊?啊?
*Xiǎng shénme xīnshì a? a?*
Think what concerns $SFP_{Mod}$?
'What were you thinking about?'

Callhome/0742

The construction [正在琢磨心事儿呢] *zhèngzài zuómó xīnshìr ne* '(I'm) just contemplating my thoughts' is a highly focalised one, as it occurs in a relatively limited, uninterrupted time-span, distinctively marked with the temporal adverb 正 *zhèng* 'just' (code C from Table 1), the pre-verbal progressive marker 在 *zài* (code D from Table 1) and the aspectual sentence final 呢$_1$ *ne* (code H from Table 1).

In example (5) the event is construed as a durative one (entailing low focality), as it is framed more vaguely and which could include phases where the process could be interrupted:

**4** Marker of current relevance to the present.

**5** Progressive.

(5) [Durative event]

A: 现在在那个论文在还准备还就还在写, 是吧?
*Xiànzài zài nàge lùnwén zài hái zhǔnbèi hái jiù hái zài*
now PROG that paper PROG still preparing still just still PROG
*xiě, shì ba?*
write, right?
'You're still preparing that paper, and still writing it, right?'

B: 还在做, 还没写呢。
*Hái zài zuò, hái méi xiě ne, āiya.*
still PROG do, still not write $SFP_{Mod}$
'Still working on it, haven't written it.'

Callhome/782

Assessing whether imperfective events are conceptualised as focal rather than durative ones also involve assessing how grammaticalised an imperfective construction is. This is because highly focalised constructions undergo constructional change towards increasingly vague conceptualisations of continuous states. One case in point is the English progressive, originally only a focal imperfective construction, in time acquiring new durative polysemies (Chen 2003). Additionally Mandarin imperfective constructions are diverse, drawing on grammatical resources from both northern and southern dialects. As discussed in Section 2.4, their typological richness enables a close examination of how dialogic priming interacts with varying degrees of aspectual salience.

## 2.3 Imperfective aspect and event representation

The imperfective aspect plays a key role in event representation (Madden and Zwaan 2003). Magliano and Schleich (2000) developed narrative passages that contained aspectually marked sentences and found that events described using the imperfective are primarily perceived as ongoing and retained in working memory for longer than perfectives. This suggests that imperfectives engage readers in a more active form of mental simulation, with a more specific focus on the unfolding of events. Ferretti et al. (2007) used event-related brain potential (ERP) to show that when participants are exposed to imperfective aspect primes, they are more likely to activate world knowledge related to the ongoing state of the event (e.g., typical locations or instruments involved). In contrast, perfective primes lead to quicker recognition of event completion, reflecting a more condensed mental representation of the event. Golshaie and Incera (2021) found that participants were more likely to incorrectly recall an implied instrument as being explicitly mentioned in a sentence

when it was presented in the imperfective aspect. For example, after reading a sentence like *Sara is slicing the zucchinis* participants often believed the word *knife* had been mentioned. In contrast, the perfective aspect had a stronger tendency to block access to situation details of that situation, leading to a more abstract representation of the event as completed. Despite such remarkable findings, there are yet two important gaps in the literature on aspectual priming:

i. It is mostly based on experimental evidence, somewhat overlooking the priming effects of aspect in naturalistic conversation.
ii. It broadly focuses on the distinction between perfective and imperfective event representation, but it does not investigate aspectual salience in each category.

This study aims to tackle both issues, as it is based on naturalistic dialogic interaction and focuses on the effects more versus less focalised imperfective has on speakers' dialogic alignment.

## 3 Resonance and dialogic imitation

This study adopts a usage-based perspective on natural speech as composed of constructions – that is, as holistic pairings of form and meaning (Goldberg 1995, 2006; Kay and Fillmore 1999; Langacker 1987; Tomasello 2003; Traugott and Trousdale 2013). The usage-based model highlights individuals' capacity to identify and categorise constructions based on natural exposure to language use. Recent years have seen renewed emphasis on co-construction of meaning within conversational exchanges, exploring how speakers jointly conceptualise them during dialogue (e.g., Haugh 2007; Arundale 2010; Weigand 2018). Dialogic Syntax (Du Bois 2014; Tantucci and Wang 2021; Zima and Brône 2015) extends this line of enquiry with a strong focus on grammatical structure, that is on constructions that result from speakers' joint efforts to categorise meaning through interaction. For instance: a salutation such as [A: *How're you doing*? | B: *Not too bad, how about yourself*?] is constructed by two individuals as a unit with structural properties and semantic meaning, performing the joint project of a greeting. In this way, constructions emerge dynamically (Hopper 2011) because of interlocutors' dialogic engagement. This often involves creative re-elaboration of forms and meanings throughout an interaction, e.g., a telephone exchange such as [A: ***I'm now taking the bus***] B: [*Ok,* ***I'm just cooking dinner***.], with B re-using the [*I'm* $ADV_{Temp}$[6] $V_{Prog}$[7] Obj] structure in her response. Linguistic processing is inherently 'recombinant' (Tantucci and Lepadat 2024; Tantucci and Wang 2024), as speakers constantly and quickly adjust

6 Temporal adverb.
7 Verb in progressive form.

structure and meaning to new dialogic stimuli. Such re-use and re-combination of an interlocutor's constructions is often creative (Tantucci 2023) and is defined as dialogic resonance. Resonance is a distinctive form of alignment (Pickering and Garrod 2021), as it more specific than mere cognitive and communicative coordination. It represents a form of complex imitation (Arbib 2012), which may occur either implicitly or explicitly, as speaker B recognises and builds upon what speaker A has said, treating it as a structural and functional substrate for subsequent turns (Goodwin 2013):

*Since you (A) said that X, I (B) recombine X in the new form of X'.*

Dialogic resonance has been found to be comparatively more impeded in Autism Spectrum Disorder (e.g., Tantucci and Wang 2023), partly because it plays a crucial role in guiding verbal engagement – allowing speaker B to formally acknowledge the relevance of what speaker A has said in order to sustain the interaction. This constructional approach to dialogue enables the quantitative analysis of verbal engagement and joint categorisation of form and meaning among speakers, as in the example below retrieved from an Air UK sales meeting in the British National Corpus[8] (BNC1994):

(6) A: I **could hear her thinking it** then.
B: <laugh> **he could hear you thinking that** he was a silly old git <laugh>.
BNC/JN6/1006

In this interaction, resonance occurs with a Stuart (B) chatting with a colleague (A). A's original construction [*I could hear her thinking it*] is re-elaborated by B in the form of [*he could hear you thinking that*]. There are semantic, pragmatic, and morphosyntactic analogies between the two forms. There is a verbatim repetition of specific words, *could, hear* and *think*. The subject and the object of each construction before and after *hear* are all Personal Pronouns (Pp). This allows the categorisation of the more schematic construction [$Subj_{Pp}$[9] *could hear* $Obj_{Pp}$[10] *thinking* Obj] as a pairing of form and meaning. It expresses the idiomatic meaning of someone (in the $Subj_{Pp}$ position) *'hearing'* the thoughts of someone else (in the $Obj_{Pp}$ position). Rhetorical effects are also present: B re-combines A's expression to engage with them, as s/he empathises with A's 'presumed' state of mind. The emergence of a dialogic construction is referred to as a diagraph (Du Bois and Giora 2014: 354) as given in Table 2. When the original ad hoc construction is modified, that is marked as underlined text (in case of replacement) and in brackets (in case of (addition)):

**8** http://bncweb.lancs.ac.uk. Last accessed: 22/10/2024.
**9** Personal pronoun Subject.
**10** Personal pronoun Object.

**Table 2:** Diagraph [$Subj_{Pp}$ *could hear* $Obj_{Pp}$ *thinking* Obj].

| | $Subj_{Pp}$ | *could* | *hear* | $Obj_{Pp}$ | *thinking* | Obj |
|---|---|---|---|---|---|---|
| A: | *I* | *could* | *hear* | *her* | *thinking* | *it* |
| B: | *he* | *could* | *hear* | *you* | *thinking* | *that* P |

Resonance may also involve cognitive alignment in the way both speakers verbally construe events. More specifically, [$Subj_{Pp}$ *could hear* $Obj_{Pp}$ *thinking* Obj] is a construction of high focality (Chen 2003) as the evoked scenario, i.e., the thinking activity – despite being abstract – is processed as ongoing at a specific point of reference. This would be different to, say, [*He often imagined you thinking it*], which would extend to a longer and more blurred stretch of time.

In this paper, we look at whether the imperfective constructions used by speaker A influence speaker B's aspectual choices in response . Similarly, we are interested in the dialogic effects of different aspectual construing processes on working memory, i.e., whether high focusing imperfectivity (i.e., imperfectivity that represents a specific moment in time) is more likely to stay activated and re-enacted in dialogue than continuous imperfectivity (underpinning an unspecific period in which some state persists). The usage-based assumption behind this study is that verbal representation of event structure is directly affected by dialogic stimuli in naturalistic interaction. This may depend on implicit and explicit mechanisms. Alignment (Pickering and Garrod 2021) is argued to result from the automatic ability to adjust to others' behaviour. At the same time, it has also been found that verbal imitation (i.e., dialogic resonance) often involves creativity and correlates with explicit intersubjective marking at the sentence periphery and politeness reciprocity, which are, in turn, explicit interactional phenomena (Culpeper and Tantucci 2021; Culpeper et al. 2025; Tantucci et al. 2022). Priming persistence is found to arise from both implicit learning and explicit memory, with the latter contributing to immediate but transient effects (Bernolet et al. 2016) which are mostly resource-limited and attention-dependent (Zhang et al. 2020). Whether the activation of specific aspectual representations across interlocutors is an implicit or explicit mechanism goes beyond the scope of this paper. We acknowledge the theoretical importance of this distinction, but disentangling these mechanisms would require experimental methods or longitudinal data beyond what is available in a naturalistic corpus-based study.

What remains of interest for our study is whether aspectual representation is significantly affected by the dialogic input by another interlocutor. Put simply, if speaker A opts to represent linguistically some event in a particular way, is speaker

B going to opt for a similar way to represent the same event? This study will aim to answer the following research questions:

1. Do highly focal imperfectives have a stronger priming effect in naturalistic conversation than durative ones?
2. What is the priming effect of complexity? Do larger constructions lead to greater resonance in conversation?
3. What is the role of information structure? Does the presence of transitive/locative objects affect dialogic resonance of imperfectives?

## 4 Data retrieval and annotation

The data of this research were retrieved from the recorded audio and transcripts of Mandarin Chinese speakers' telephone conversations in the CallHome (among family members) and CallFriend corpora (among friends). Each corpus consists of 120 and 60 unscripted telephone conversations, respectively, each totaling approximately 250,000 words (Liu et al. 2006). Callhome and Callfriend speakers were aware they were being recorded but were not given any guidelines regarding the content of their conversations. The situated nature of this context (e.g., absence of proxemics, kinesthetic cues) provides an opportunity to focus primarily on the textual dimension of verbal interaction. We retrieved in total 236 imperfective aspect constructions, including 174 from CallHome corpus and 62 from the CallFriend corpus.[11]

For the annotation, we focused on several dimensions: whether the imperfective was 'dialogically' primed by a previous construction (resonating vs independent); the source of resonance, if any (self vs other); the degree of dialogic resonance; the distance from the dialogic prime to the point of resonance, the imperfective function (durative vs focalised), and the speaker's accents (Northern or Southern Mandarin) were all annotated. Accent was assessed aurally during the review of the recordings and included as a variable to explore whether structural differences in the use of Mandarin imperfectives might also be influenced by dialectal variation – an intriguing possibility tentatively raised by Liu (2022: 8). Finally, the form of imperfective aspect expressions could be analysed as a construction occupying nine syntactic slots at most (irrespective of the core verb in counting), based on the typological features of Chinese. These are given in Table 1, Section 2.2.

**11** Corpora webpages: https://ca.talkbank.org/access/CallHome/zho.html; https://ca.talkbank.org/access/CallFriend/zho-m.html. Last accessed: 29/09/2024.

## 4.1 Annotation of syntactic slots

While most imperfective constructions' slots given in Table 1 could be annotated based on formal criteria (e.g., presence vs absence of a temporal adverbial, as for category A), some others required functional diagnostics, two in particular:

i. Object Argument (F). The integration of a verb and its object argument is part of a lexicalization continuum (Brinton and Traugott 2005; Dong 2009), especially in Mandarin Chinese. It was thus not easy to draw a clear boundary between intra- and extra-word arguments. To keep the annotation consistent, we did not distinguish between these two types of object arguments. Some VO constructions such as 说话 *shuōhuà* 'say something' and 发烧 *fāshāo* 'have a fever' are traditionally seen as compound words in canonical Chinese dictionaries (see Dictionary Department ed., Dictionary Department 2016). However, we annotated them all as having an object argument. In addition, non-patient objects (e.g., 烤电 *kǎodiàn* 'diathermy, warm with electricity') and fronting objects (e.g., 他那房 *tānàfáng* 'his house' in 他那房正在盖呢 *tānàfáng zhèngzài gài ne* 'It is his house that they are building') were also annotated as object arguments. The function of object arguments in Chinese imperfective constructions will be discussed in detail in Section 5.

ii. Sentence final particles, SFP (H and I). Chinese declaratives SFP can be classified into two types: SFPs denoting aspectual values ($SFP_{Asp}$) and SFPs expressing modal meanings ($SFP_{Mod)}$ (Zhu 1982: 208). In fact, there are two distinct SFPs 呢 *ne* in Mandarin Chinese, i.e., sentence final progressive aspect marker 呢$_1$, which contributes to the truth value of the sentence and sentence final modal particle 呢$_2$ that is associated with modality and (inter-)subjectivity (Tantucci 2021). Typical (inter-)subjective SFPs such as 啊 *a*, 呀 *ya*, and 哦 *o* (Tantucci and Wang 2020) in Chinese were directly annotated as $SFP_{Mod}$. SFP 呢$_1$ *ne* was classified annotated as $SFP_{Asp}$ unless it occurred in negative sentences or contexts with emphasing adverbs (e.g., 才 *cái*, 还 *hái*) and in combination with other aspect markers (e.g., 了 *le*) which are typical contexts where 呢 acquires a modal value (cf. Chen 2022: 45). For instance, in (7), 呢 *ne* occurs in A's turn as SFP of an event marked by the perfect sentence-final 了 *le.* This is a context where the imperfective meaning of 呢$_2$ *ne* is incompatible with 了 *le*, and would be then annotated as $SFP_{Mod}$.

(7) A: 是不是这手术可以做了呢?
*Shìbúshì zhè shǒushù kěyǐ zuò le ne?*
is-not this surgery can do CRS $SFP_{Mod}$
'Can this surgery be done already?'

B: 还没有呢。
*Hái méiyǒu ne*
Still not-yet $SFP_{Mod}$
'Not yet.'

CallFriend/5973

Resonance was measured according to the Dialogic Categorisation Model (Tantucci 2023a), which is based on the following conditions:

i. Resonance can be identified when there is at least one word – including interjections or pragmatic markers – that is repeated verbatim from interlocutor A to B.
ii. The measurement of resonance is based on the number of internal constituents of the dialogic construction that emerges from both A and B's constructs.
iii. (Tantucci and Wang 2024: 7)

Consider the case of (8) below:

(8) A: 他在敲门啦?, 你给他开门吧。
*tā zài qiāo mén la? nǐ gěi tā kāi mén ba*
he PROG knock door $SFP_{Mod}$ you for him open door $SFP_{Mod}$
'Is he knocking on the door? You should open the door for him.'
B: 呃, 没有关系, 我在打电话。
*e, méiyǒu guānxì, wǒ zài dǎ diànhuà*
BACK,[12] no relation, I PROG make call
'Eh, it doesn't matter, I'm talking over the phone.'

Callhome/1303

In the exchange, A uses a focal imperfective 在敲门 *zài qiāo mén* 'knocking at the door', construing the process of the event at the very moment of speech. This is then resonated also with a focal imperfective by B in the form of 在打电话 *zài dǎ diànhuà* 'talking over the phone', with the emergence of the dialogic construction [$Subj_{Pp}$ 在$_{Foc}$ V Obj]. This satisfies the two conditions for the annotation of resonance above. There is a verbatim repetition of at least one word (or interjection), namely 在 *zài.* There is also structural analogy across turns, which can be generalised as a dialogic construction including the pre-verbal imperfective marker 在 *zài* followed by a transitive structure V Obj, as shown in the diagraph in Table 3.

Resonance is annotated as a continuous variable, corresponding to the internal constituents of dialogic constructions emerging across turns. In the case of Table 3, the resonance value is 4, comprising the constituents $Subj_{Pp}$ + 在$_{Foc}$ + V + Obj.

12 Backchannel.

**Table 3:** Diagraph [$Subj_{Pp}$ 在$_{Foc}$ V Obj].

| | $Subj_{Pp}$ | 在$_{Foc}$ | V | Obj |
|---|---|---|---|---|
| A: | 他 | 在$_{Foc}$ | 开 | 门 |
| B: | 我 | 在$_{Foc}$ | 打 | 电话 |

**Table 4:** Sample line of annotation.

| Resonance | Distance | Form | Slots | Priming | Function | Accent | Corpus | ID |
|---|---|---|---|---|---|---|---|---|
| 4 | 4 | D | 1 | Y | Foc | Nor | Callhome | 1303 |

Another key element of our annotation was distance, which we measured in Intonation Units (IUs) (cf. Chafe 1994) from the prime to the resonating construction. IUs correspond to a single intonation contour (Chafe 1994; Croft 1995; Du Bois et al. 2014; Tao 1996); they end with continuing or falling intonation and are separated by at least a brief pause. In the case of (6), there are 4 IUs from the dialogic prime (what is being resonated) up to the resonating construction.

For each imperfective that we encountered in our dataset, we annotated the form of Mandarin imperfective constructions, based on Table 1. For pre-verbal 在 *zài,* the code is D, with just one slot present: 1. We annotated whether an imperfective was used following a preceding one (Priming). We assessed whether the imperfective function was a focal versus a durative one (e.g., see Johanson 1971: 159, 2000: 38). Although the focality of Chinese progressive and imperfective aspect markers are shown to be a continuum (Chen 2003), we distinguished between 'focalised' and 'durative' functions. If the situation that the construction denotes occurs uninterruptedly in a limited timespan, then its imperfectivity is a focalised one; if the situation occurs duratively, repeatedly or habitually in a relatively broad timespan that could be interrupted, its imperfectivity function is then a durative one. We finally controlled for speakers' accents (Northern vs Southern), Corpus (Callhome vs Callfriend) and conversation ID.

A sample line of annotation based on example (8) is given in Table 4.

A second annotated example from our dataset is given below:

(9) A: 没有, 吃饭呢他们。
*méiyǒu, chīfàn ne tāmén*
Not yet, have a meal $SFP_{Asp}$ they
'Not yet, they are having a meal.'

**Table 5:** Diagraph: [吃饭呢$_{Foc}$].

| | 吃 | 饭 | 呢$_{Foc}$ |
|---|---|---|---|
| A: | 吃 | 饭 | 呢$_{Foc}$ |
| B: | (正)吃 | 饭 | 呢$_{Foc}$ |

B: 正吃饭呢,那快去忙。
*Zhèng chīfàn ne, nà kuài qù máng*
just have a meal SFP$_{Asp}$, then hurry go do
'Just having a meal, then just go and get things ready.'
CallFriend/4559

In the exchange, A uses a focal imperfective 吃饭呢 *chīfàn ne* '(be) having a meal', construing the process of the event at the very moment of speech. This is then resonated by B in the form of 正吃饭呢 *zhèng chīfàn ne* 'just having a meal', with the emergence of the highly specific dialogic construction [(吃饭呢] (Table 5).

This is a case where the resonance value is 3, corresponding to verbatim repetition of the same construction from speaker A to B. Distance is 1, as the resonating IU occurs immediately after the priming form. With reference to B's response, the Form variable is (C + H, see Table 1), including a pre-verbal adverbial and the sentence-final 呢$_1$ *ne*, including two slots. Priming is dialogically evident and imperfectivity is focalised, as the event is construed as occurring uninterruptedly in a limited time span. The accent is Northern, and the corpus is the CallFriend.

A third example of annotation, including a durative imperfective, is the one below:

(10) A: 那他那个办得怎么样, 还不知道呢。
*nà tā nàge bàn de zěnmeyàng, hái bù zhīdào ne.*
then he that thing do DCM[1] how, still not know SFP$_{Asp}$
'How did he handle that? We still don't know.'
B: 对。
*duì.*
right.
'Right.'
A: 就是哦。
*Iùshì o.*
Exactly SFP$_{Mod}$
'Exactly (emphasis).'

**Table 6:** Diagraph [Pred 呢$_{Dur}$].

| | Pred | 呢$_{Dur}$ |
|---|---|---|
| A: | 还不知道 | 呢$_{Dur}$ |
| B: | 等你一封信 | 呢$_{Dur}$ |

B: 那我不知道, 我就等你一封信呢。
*nà wǒ bù zhīdào, wǒ jiù děng nǐ yī fēng xìn ne.*
then I not know, I just wait you one CL letter SFP$_{Asp}$
'Well, I don't know, I'm just waiting for a letter from you,'
Callhome/782

Here, A's original imperfective [还不知道呢] *hái bù zhīdào ne* 'we still don't know' is resonated by B in the form of [等你一封信呢] *děng nǐ yī fēng xìn ne* 'I'm just waiting for a letter from you': 呢 1 *ne* is repeated across turns with the emergence of the schematic construction [Pred 呢$_{Dur}$]. The internal constituents are 2, i.e., the resonance value for B's turn, as per the diagraph in Table 6.

Distance comprises 4 IUs. B's Form variable is H (see Table 1). Priming is dialogically evident and B's accent is Southern. The imperfective is durative, as it broadly construes a process that can be interrupted (e.g., *one may stop wondering if s/he knows something and then start thinking about it again*) and is not restricted to a limited time-span. The accent is Southern, and the corpus is the Callhome. Three independent annotators disambiguated resonance accent and focality values throughout our dataset's observations. The rating accuracy was measured through three rounds of annotation with Krippendorff's Alpha and corresponded, respectively, to $\alpha$ = 0.62, $\alpha$ = 0.71, and finally $\alpha$ = 0.86 for resonance, $\alpha$ = 0.96 for accent, $\alpha$ = 0.76, $\alpha$ = 0.83, and finally $\alpha$ = 0.91 for focality (inter-rater agreement exceeded $\alpha$ = 0.8 for all three variables). At each stage, 40 % of the data were independently annotated. Cases of disagreement were resolved among the annotators before moving to the annotation of a new randomised sample.

# 5 Results and analysis

A key goal of this study was to assess how imperfectivity is resonated across interlocutors in Mandarin conversation. To do so, we calculated the degree of resonance in each of B's turn where A had just used an imperfective.

## 5.1 Statistical methods

To investigate how Mandarin imperfective constructions influence dialogic resonance and how their usage varies across speakers and dialects, we adopted a multimethod approach combining Bayesian modelling and unsupervised clustering. These methods were chosen for their ability to handle complex, non-independent observations and to uncover both predictive relationships and latent structure within the dataset.

Our modelling strategy serves three complementary purposes:

1. To measure how grammatical and cognitive factors shape resonance across turns, we used a Bayesian mixed effects linear regression, which estimates the effect of constructional properties (e.g., objecthood, focality, complexity, distance) on the degree of resonance elicited by an imperfective construction. This model is reported in Section 5.2.
2. To explore structural patterns among imperfective constructions, we employed hierarchical clustering, which groups constructions based on morphosyntactic similarity. This unsupervised method highlights recurrent constructional patterns and their associations with resonance and sociolinguistic features. Results of this analysis are presented in Section 5.2.1.
3. To test whether constructional preferences vary by dialect, we applied a Bayesian logistic regression predicting speaker accent based on imperfective construction type. This model allows us to assess how form-meaning pairings correlate with regional variation. It is discussed in Section 5.2.2.

## 5.2 Bayesian modeling of resonance

We first fitted a mixed-effects Bayesian regression (e.g., Baldwin and Larson 2017), which comprises prior distributions and relies on Markov Chain Monte Carlo (MCMC) sampling to capture uncertainty and make inferences in complex data structures. The dependent variable of our model was Resonance with Construction type nested into Accent and Chat ID as random effects.[13] We fitted Size, Distance, Focality, Objecthood, and Distance:Focality, Distance:Objecthood interactions as predictors.[14] For this model, we assigned priors informed by robust evidence that focus enhances working memory effects (Normal(0.1, 0.05)) (e.g., Cowan 2001; Awh and Jonides 2001; Oberauer 2009). We similarly controlled for the negative effects of

**13** The code for this was (1 | Accent) + (1 | Accent:Construction).

**14** Further Distributional Parameters: $\sigma$ = 1.21, l = 1.09, u = 1.35, Est. Error = 0.07, Rhat = 1.0.

**Table 7:** Mixed effects Bayesian regression of resonance of imperfectives in Mandarin conversation (the model normal prior distributions for the fixed effects and intercept and a Cauchy distribution for the standard deviation of random effects. We used four Markov Chain Monte Carlo (MCMC) chains and 8,000 iterations with 500 warmup steps at 0.999 adapt_delta).

| **Random effects** | | | | | |
|---|---|---|---|---|---|
| **Accent** | **(2 Levels)** | | | | |
| | **Estimate** | **Est.Error** | **l-95 % CrI** | **u-95 % CrI** | **Rhat** |
| SD(Intercept) | 0.55 | 0.85 | 0.01 | 2.70 | 1.00 |
| Accent:Constructions | (74 levels) | | | | |
| ID | (97 levels) | | | | |
| SD(Intercept) | 0.32 | 0.14 | 0.03 | 0.59 | 1.00 |
| **Regression coefficients** | | | | | |
| | **Estimate** | **Est.Error** | **l-95 % CrI** | **u-95 % CrI** | **Rhat** |
| Intercept | −0.05 | 0.65 | −1.37 | 1.17 | 1.00 |
| Distance | −0.18 | 0.04 | −0.25 | −0.11 | 1.00 |
| Focal | −0.07 | 0.19 | −0.45 | 0.29 | 1.00 |
| Object | 0.09 | 0.20 | −0.29 | 0.47 | 1.00 |
| Size | 0.29 | 0.08 | 0.15 | 0.44 | 1.00 |
| Distance:Focal | 0.11 | 0.04 | 0.03 | 0.19 | 1.00 |
| Distance:Object | 0.11 | 0.04 | 0.04 | 0.19 | 1.00 |

temporal/discoursive distance ((Normal(−0.2, 0.05)) on priming (e.g., Bock and Griffin 2000; Magliano and Schleich 2000). The results of our model are reported in Table 7.

The top of Table 7 reports the Random effects, indicating the variation due to Accent, Construction types and chat IDs. The fixed effects below show the estimated influence of each predictor (such as Distance, Focality, Objecthood or Size) on dialogic resonance, with positive values suggesting an increase and negative values indicating a decrease. The Estimate Error column shows the degree of uncertainty around these estimates, while lower (l) and upper (u) 95 % Credible Intervals (CrI) provide a range in which the true effect likely falls. If this range includes zero, the effect is likely not statistically meaningful. Rhat checks model convergence, with values close to 1 indicating reliable estimates, and Bulk ESS and Tail ESS reflect the precision of the model, with higher values being better.

## 5.3 Findings and interpretations

The first important finding of this regression is that increasing distance (in intonation units, IUs) from the imperfective leads to a resonance decrease. In other words,

**Table 8:** Mixed effects Bayesian regression of Accent and imperfective markers in Mandarin conversation (further distributional parameters: $\sigma$ = 1.21, l = 1.09, $u$ = 1.35, Est. Error = 0.07, Rhat = 1.0).

| **Random effects:** | | | | | |
|---|---|---|---|---|---|
| | **Estimate** | **Est.Error** | **l-95% CrI** | **u-95% CrI** | **Rhat** |
| Accent | (2 Levels) | | | | |
| sd(Intercept) | 0.73 | 0.99 | 0.01 | 3.60 | 1.00 |
| Accent:Constructions | (116 levels) | | | | |
| sd(Intercept) | 0.19 | 0.13 | 0.01 | 0.47 | 1.00 |
| ID | (74 levels) | | | | |
| sd(Intercept) | 0.31 | 0.14 | 0.04 | 0.58 | 1.01 |
| **Regression coefficents:** | | | | | |
| | **Estimate** | **Est.Error** | **l-95 % CrI** | **u-95 % CrI** | **Rhat** |
| Intercept | −0.03 | 0.74 | −1.58 | 1.48 | 1.00 |
| Distance | −0.16 | 0.08 | −0.31 | 0.00 | 1.00 |
| Focal | −0.10 | 0.20 | −0.50 | 0.30 | 1.00 |
| Object | 0.10 | 0.22 | −0.33 | 0.54 | 1.00 |
| Size | 0.27 | 0.12 | 0.05 | 0.50 | 1.00 |
| Distance:Focal | 0.09 | 0.07 | −0.04 | 0.23 | 1.00 |
| Distance:Object | 0.10 | 0.08 | −0.06 | 0.25 | 1.00 |

the more that is said after speaker A uses an imperfective, the lower the degree of resonance of that imperfective by speaker B. This is what we expected: speakers' working memory does a better job at alignment with constructions they have just been heard in conversation. In contrast, their ability to resonate and re-use the linguistic material they heard will unavoidably decrease with time and the progression of the conversation. This is particularly evident in Figure 1, where increasing IUs of speaker A's turn (given as Distance on the *x*-axis) predicts a decrease of resonance of the imperfective in the following speaker B's turn ($\beta$ = −0.18, 95 % CrI: −0.25, −0.11).

This figure illustrates the baseline relationship between dialogic distance (in intonation units) and resonance in the following speaker's turn. It provides a foundational reference point for interpreting the more detailed interaction patterns explored in Figures 3 and 4. A second important finding of this study is that the larger the size of the priming imperfective (its complexity, i.e., the number of words it is made of), the higher the degree of resonance in the subsequent turn. As Figure 2 shows, roughly every four words used in the imperfective construction by speaker A leads to an increase of one resonating constituent in the imperfective subsequently uttered by speaker B ($\beta$ = 0.29, 95 % CrI: 0.15, 0.44).

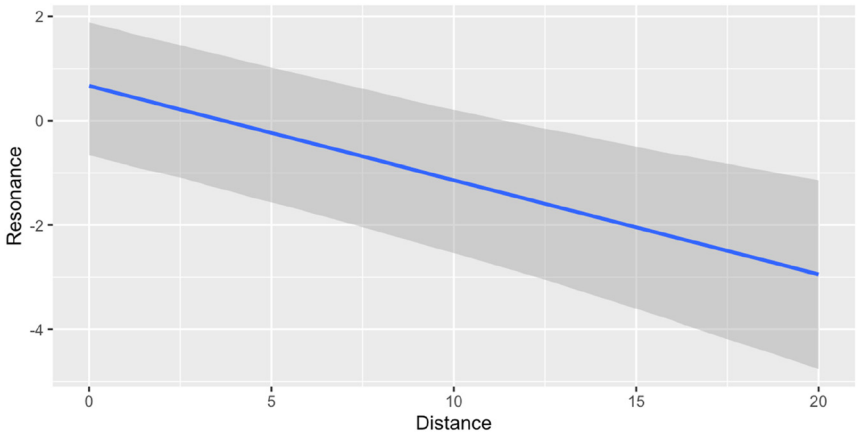



**Figure 1:** Main effect of dialogic distance on resonance.

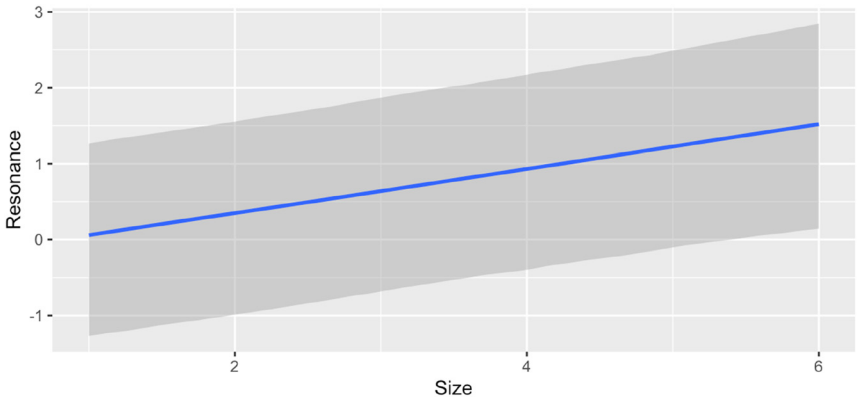



**Figure 2:** Size of imperfectives (constructional complexity) as a predictor of resonance.

Example (11) illustrates a case of shorter size (often called low complexity in construction grammar cf. Bybee 2010; Tantucci 2021) leading to low resonance.

(11) [low complexity, low resonance]:
A: 还在做, 还没写呢, 哎呀。
*hái zài zuò, hái méi xiě ne, àiya*
still PROG do, still not yet write $SFP_{Asp}$, $SFP_{Mod}$
'I am still doing (experiments). I haven't written the paper, oh.'

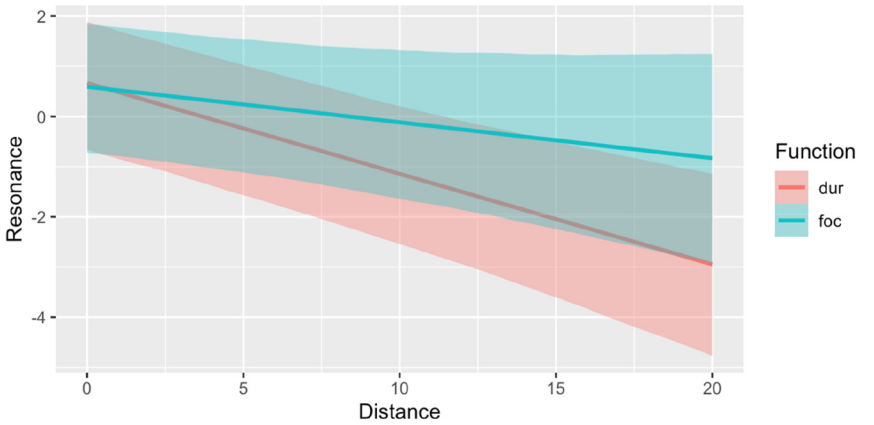



**Figure 3:** Interaction between distance and focality as a predictor of resonance.

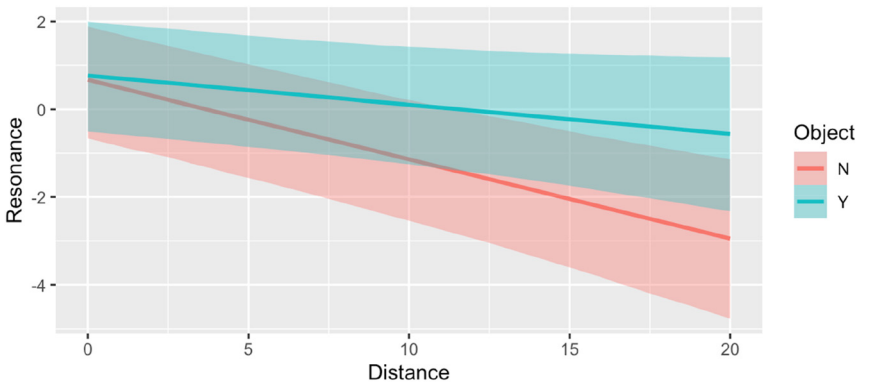



**Figure 4:** Interaction between distance and objecthood as a predictor of resonance.

B: 啊, 在做实验, 你这反正关键靠实验呃啊?
*a zài zuò shíyàn, nǐ zhè fǎnzhèng guānjiàn kào shíyàn e a*
BACK[15] PROG do experiment, you this anyway crucially rely on experiment $SFP_{Mod}$
'Ah, you are doing an experiment, does your paper rely on the experiments crucially?'

CallHome 0782

15 Backchannel.

In (11) A's imperfective [在做 Obj] *zài zuò* 'be doing' is resonated by B as [在做实验] *zài zuò shíyàn* 'be doing an experiment', giving rise to the schematic construction [在做 Obj], with a resonance value of 3.

In (12) below we have a case of larger size (higher complexity), leading to increasing resonance in the subsequent turn:

(12) [high complexity, high resonance]
A: 现在正在办签证呢, 欸。
*xiànzài zhèng zài bàn qiānzhèng ne ei*
now just PROG apply visa $SFP_{Asp}$ $SFP_{Mod}$
I am just applying for a visa now.'
B: 正在办签证, 是吧?
*Zhèng zài bàn qiānzhèng, shì ba*
Just ASP apply visa, be $SFP_{Mod}$
'You are just applying for a visa, isn't it?'

CallHome zho 0766

In this case, A's form [正在办签证呢, 欸] *zhèng zài bàn qiānzhèng ne* 'I am just applying for a visa now' is resonated by B as [正在办签证, 是吧?] *zhèng zài bàn qiānzhèng, shìba* 'just applying for a visa isn't it?', giving rise the dialogic construction [正在办签证 SFP], with a resonance value of 5: 正 + 在 + 办 + 签证 + $SFP_{Mod}$.

The model also showed important interactions involving the type of aspect used across speakers. We have already seen that increasing distance from the priming imperfective leads to a decrease in resonance. What is more important is that such a decrease is sharper for durative imperfectives than focal imperfectives ($\beta$ = 0.11, 95 % CrI: 0.03, 0.19), as shown in Figure 3. This is the tendency that we expected: the more specific the construal of an ongoing event, the more vivid the impression on the hearer in the subsequent turn.[16]

Another important interaction is between imperfectives that include a transitive or locative object and ones without any. We found that even in this case, the priming effects of imperfectives that include an object are stronger across speakers' turns, as resonance tends to decrease more slowly than for objectless constructions ($\beta$ = 0.11, 95 % CrI: 0.04, 0.19).[17] No other construction type that we

**16** It is important to remark here that, due to the limited size of naturalistic at our disposal, some uncertainty is still present (Est. Error = 0.04) but the effect of distance remains prominent in this interaction.

**17** Like what we noted for Figure 2, some degree of uncertainty needs to be acknowledged (Est. Error = 0.4). Even in this case, the coefficient value is almost 3 times the Est. Error within a relatively short credible interval.

For instance, if D.Y (Feature D is present) has a difference of -0.38, it means that in Cluster 1, D.Y appears 38 % more frequently than in Cluster 2).

analysed had a similar effect on resonance. This indicates that [Subj V $Obj_{Pat/Loc}$] constructions tend to prime hearers more than any other, presumably because they are more informative on the one hand, and also easier to process than, say, obliques, on the other. This is particularly evident in Figure 4.

### 5.3.1 Hierarchical clustering of imperfective construction types

At this stage, we examined the distribution of various imperfective constructions in Mandarin conversation and the sociolinguistic factors that may influence the preference for certain structural features over others. We thus fitted a hierarchical clustering model, an algorithm that groups data into hierarchically nested clusters based on their similarity (we used Euclidean distance with Ward.D2 amalgamation, cf. Levshina 2015). The process starts with each data point as its own cluster, then successively merges the most similar clusters together, forming a tree-like structure called a dendrogram (e.g., Gries 2010; Tantucci 2020; Tantucci and Wang 2022). Different levels of constructional similarity was obtained for all imperfective slots in our data (see Table 1) and their attraction to accent, resonance (coded as High vs Low, depending on the Median value), imperfective functions, objecthood, presence of Sentence Final Particles (SFP) and so on (see the corresponding dendrogram in the Appendix). We then reduced the clustering structure into a two-dimensional representation via multidimensional scaling (MDS). This maps the attraction among constructions with the highest degree of similarity, as given in Figure 5 (Bubble sizes indicate frequencies).

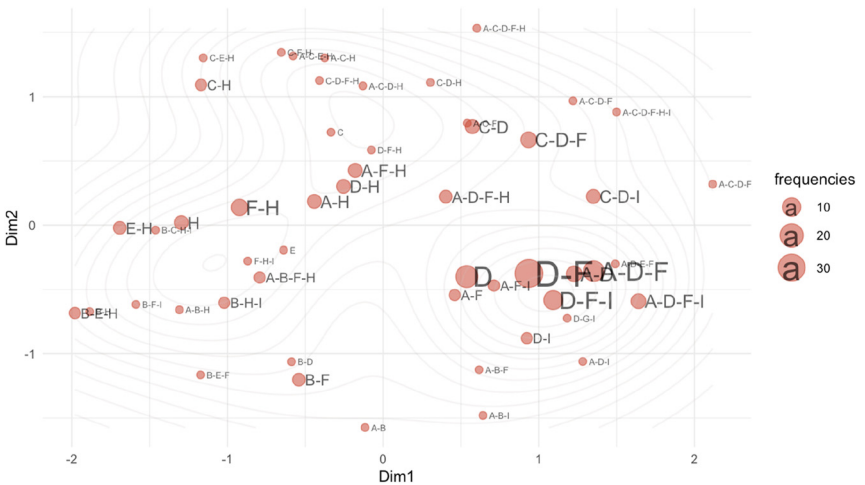



**Figure 5:** Two-dimensional scaling of hierarchical clustering of imperfective construction types in Mandarin conversation.

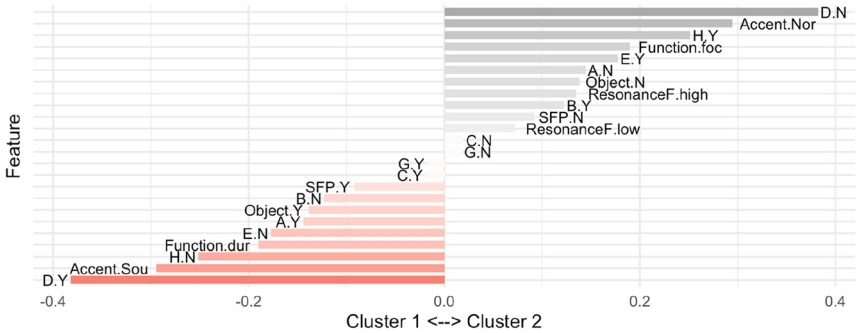



**Figure 6:** Snake plot of the factors determining constructional similarity among Chinese imperfectives.

The map reveals a distinctive division between two areas, one on the left-hand side of the map, mostly including the H slot (Aspectual 呢 *ne*, see Table 1), and one at the bottom right-hand side, clustering around constructions including the D slot (pre-verbal 在 *zài*). We then looked at the factors that most decisively determined this partition. Accent emerged as a key factor in the distribution of the imperfective use of either form in Mandarin conversation. This is easily captured in the snake plot in Figure 6.

Figure 6 indicates how variables tend to cluster together towards the left (red) versus the right-hand side (grey) of the plot. The *x*-axis represents the difference in mean proportion of each variable between Cluster 1 and Cluster 2. Variables are sorted in ascending order on the *Y* axis according to their relative importance in distinguishing the clusters. We can see that the D slot (D.Y, i.e., presence of preverbal 在 *zài*) seems to be the stronger factor 'pulling' Southern Accent towards the left. Similarly, we can see that the absence of D (D.N), is the stronger factor 'attracting' Northern accent, together with H (Aspectual 呢$_1$ *ne*) and E (着 *zhe*) slots. This pattern highlights a clear sociolinguistic divide: 在 zài is rarely used in the North but commonly found in Southern speech, a striking contrast that, to our knowledge, has not been previously articulated so explicitly.

### 5.3.2 Bayesian analysis of accent variation

To confirm this exploratory finding, we conducted a mixed-effects logistic Bayesian regression, with all slots as predictors of Accent, and Conversation ID as a random effect, see Table 8.[18]

**18** To incorporate prior knowledge from hierarchical clustering and previous studies on aspectual marking in Mandarin dialects (Chen 2022; Liu 2022), we specified informative priors for key

Similar to what the hierarchical clustering suggested, three predictors (slots) showed important regional tendencies: D (在 *zài*), H (呢$_1$ *ne*) and E (着 *zhe*). 在 *zài* is distinctively preferred by Southern speakers ($\beta$ = 3.10, 95 % CrI: 1.35, 4.86) while H (呢$_1$ *ne*) and E (着 *zhe*) are predominantly used by Northerners ($\beta$ = −6.59, 95 % CrI −8.79, −4.43; $\beta$ = −3.55, 95 % CrI: −6.05, −1.08).

In Southern dialects, 在 *zài* is frequently used as a progressive and imperfective marker (Hashimoto 1985; Hu 2005; Wang 1999). In Northern dialects, the imperfective functions of 呢$_1$ *ne* are much more prominent, e.g., spoken Beijing dialect (Chen 2022: 35–37; Liu 2022: 8). This could also have to do with Mandarin Chinese (also named 普通话 *pǔtōnghuà* 'Common Language') as a lingua franca (cf. Li 2006; Ostler 2022: 424) across China, integrating diachronically various constructions from Southern to Northern dialects, now all compatible in the same synchronic system. We often found in our data that 呢$_1$ *ne* can be self-sufficient in describing highly focalised progressive events among northern speakers, as in (13) below:

(13) [Northern speaker using 呢$_1$ *ne* as a progressive]:
A: 哎周雷你先坐一会儿, 对不起啊, 我给我们家打电话呢。
*Ai Zhōu Léi nǐ xiān zuò yìhuìer, duìbùqǐ a, wǒ*
BACK Zhou Lei you sit for a while, sorry $\text{SFP}_{\text{Mod}}$, I
*gěI wǒmén jiā dǎ diànhuà ne*
to our family call $\text{SFP}_{\text{Asp}}$
'Zhoulei, please sit for a while, I am talking with my family on the phone'.
CallHome/1525

On the contrary, 在 *zài* is used frequently by Southern speakers (see also Hu 2003 on 呢 *ne* being more likely interpreted modally – rather than aspectually – by Southerners).

(14) [Southern speaker using 在 *zài* as progressive]
A: 我现在因为很多朋友都在学电脑, 他们都说这个好。
*wǒ xiànzài yīnwéi hěn duō péngyǒu dōu zài xué*
I now because very many friend all PROG learn
*diànnǎo, tāmén dōu shuō zhègè hǎo*
computer, they all say this good

predictors. For instance, sentence final 呢 *ne* H, which exhibits clear regional differentiation, was assigned a Normal(−6.5, 1.2) prior to reflect a strong but flexible expectation of its effect while allowing for natural variation. Similarly, pre-verbal 在 *zài* D, which has a moderate preference shift, was assigned a Normal(3.0, 1.0) prior. Features with less structured variation, such as C and G, were given weaker constraints (e.g., Normal(−1.2, 1.2) and Normal(0.8, 1.5), respectively). The intercept was assigned a Student-t(3, −1, 3.5) prior to accommodate discourse-driven variability (Liu 2022). Prior predictive checks confirmed that these priors produced reasonable posterior distributions and avoided over-regularization while stabilizing estimates (Gelman et al. 2017).

> 'Because many friends are all learning IT now, they all say that this major is good'.
>
> CallFriend/4227

# 6 Discussion

Research on grammatical aspect priming has largely focused on the distinction between perfectivity and imperfectivity, yet little attention has been given to how varying construals of imperfectivity influence an interlocutor's linguistic behavior. We addressed this from a new angle, as we looked at whether focality affects priming and alignment across speakers. Additionally, while most research on aspectual priming is based on controlled experimental settings, this study examined spontaneously produced dialogic data from telephone call interactions. A way to control for alignment across speakers in conversation is via dialogic resonance, the way speakers (often creatively) re-use one another's constructions. We provided a replicable annotation framework called the Dialogic Categorisation Model (DCM) (Tantucci 2023a), which we implemented across all interactions in the CallHome and CallFriend corpora.

What we found is that resonance naturally decreases as the dialogue continues to unfold: the longer the stretch of conversation from A's imperfective, the lower B's resonance with that form. However, it increases when the imperfective is made of a larger construction, e.g., 她目前正在睡觉呢 *tā zhèngzài shuìjiào* ne 'she is just sleeping at the moment' rather than 她在睡觉 *tā zài shuìjiào* 'she is sleeping'. This effect may be both cognitive and socio-pragmatic. An increasing size of the original imperfective provides more information about the event and inhibits entrenched use of that construction (cf. Tantucci and Di Cristofaro 2020): highly conventionalised constructions often undergo chunking (Bybee 2010; Bybee and Moder 2024) as they tend to be shorter and semantically more bleached (e.g., *He's coming*) than longer forms that are construed ad-hoc and which include richer information about what is happening (e.g., *he is now just coming down the stairs*). Larger constructions are more likely to be processed compositionally (cf. Kay and Michaelis 2019), and thus leave a stronger impression on speakers' memory during an exchange. This suggests that alignment in conversation is responsive to both the salience and specificity of grammatical constructions. While disentangling automatic alignment from implicit learning lies beyond the scope of this study, the resonance patterns we observe – especially for focal and high-complexity imperfectives – are consistent with a mixed view, as they reflect sensitivity to structural detail, recent input but also semantic vividness. From a cognitive-pragmatic angle, politeness reciprocity

(Culpeper and Tantucci 2021; Tantucci et al. 2022) may also be at work here. Speaker A's effort in producing a more detailed construction of the event may be conversationally 'rewarded' (i.e., reciprocated) by stronger engagement by speaker B, hence with a higher degree of dialogic resonance in B's turn. This is particularly evident for the constructions we tackled in this analysis, with length varying from 2 to 6 internal constituents. Things may differ for even larger ones, as that may come with a cognitive 'cost'. Excessive amounts of information may have a negative effect on relevance and hearer's attention, as predicted by Relevance Theory (cf. Sperber and Wilson 2012).

A key aspect of this study is that aspectual focality remarkably influences the way speakers align with each other in conversation. Highly focalised imperfectives stay more vivid in interlocutors' memory than durative ones. This also applies to imperfective constructions that include transitive or locative objects. This suggests that the more saliently an on-going event is construed, the stronger the priming effects on the hearer. This is especially relevant in Chinese, where the imperfective aspect is often not obligatory (Wu 2005). It comprises a distinctively diverse range of construction types with high degree of flexibility (Xiao and McEnery 2004). This makes speakers' recombinant creativity (Tantucci 2023a; Tantucci forthcoming) a fundamental mechanism for the alignment of imperfective constructions in natural conversation: Chinese imperfectives are highly malleable and thus often creatively re-combined in natural conversation. It would be worth investigating whether similar degrees of aspectual priming emerge in languages with more constrained and morphologically obligatory aspectual systems, such as those found in the Germanic or Romance families. Related to this point, we found clear differences in the imperfective constructions used by Northern and Southern Mandarin Chinese speakers. The postverbal aspect marker 着 *zhe* and sentence-final aspect marker 呢 *ne* are preferred by Northern speakers, while the preverbal aspect marker 在 *zài* is preferred by Southern speakers, which reflects the influence of substrate dialects on the regional varieties of Mandarin Chinese and status of Mandarin Chinese as a lingua franca. Chinese imperfective constructions have been discussed both diachronically and synchronically (Hu 2003; Wang 1999).

# 7 Limitations

This study is not without limitations. For one, the size of CallHome and CallFriend corpora is limited to roughly 250,000 words each. This is reflected in some degree of uncertainty (Est. Error is around 1/3 of CI for main interactions in the first regression) of our prediction. Future development of highly controlled spoken corpora of Chinese could provide richer resources for analysing aspectual priming in Mandarin dialogue.

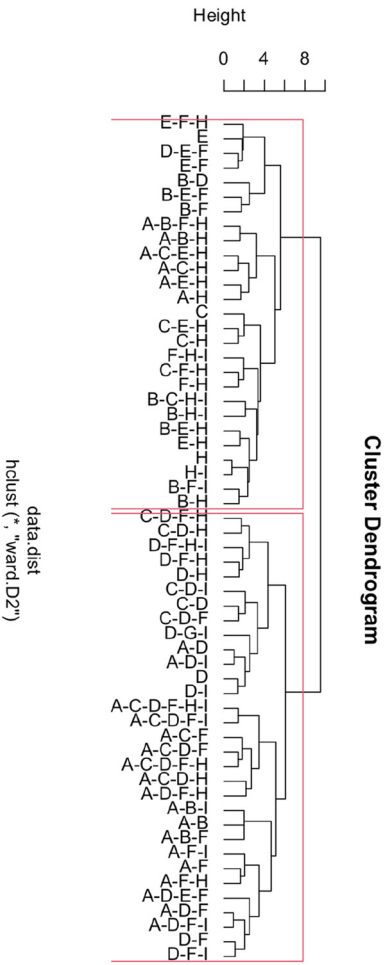
Related to that, the dialogic use of imperfective constructions could be extended to other construction types that may be retrieved from larger corpora. Also, our study controlled for Accent as a binary variable. However, dialectal variation is gradient and with larger datasets informed by speakers' demographics more fine-grained analyses of dialectal variation could be conducted. One example could be the preverbal aspect marker 有 *yǒu,* which only recently became a conventionalised Mandarin construction, as it was originally present only in Southern Dialects. Dialogic resonance may provide a powerful lens for investigating recent patterns of linguistic propagation (cf. Croft 2010) in recent years.

# 8 Conclusions

This paper has important implications for the theoretical understanding of Chinese grammar, for advances in cognitive research on priming and interactional alignment, and for conversational approaches to engagement in human interaction. It shed new light on the grammatical characteristics of Mandarin imperfective aspect in naturalistic interaction, the construction types it favors, the ones that are more likely to prime interlocutors' turns in conversation and the use of different imperfective constructions by Northern and Southern Speakers. We contributed to research in dialogic priming and alignment as we provided new evidence showing that imperfective events that focus more vividly on specific time intervals (focalised) are more likely to affect speakers' subsequent use of imperfectives in contrast to events that encode less detailed time spans (durative). We found that larger constructions, including ones with richer information structure, are also more prone to dialogic resonance and thus being re-used and re-combined by speakers in conversation. There is currently a paucity of research on aspect from a dialogic perspective and the way imperfective meanings are re-used and recalibrated across interactants in naturalistic interaction. This study also aimed to address this gap and provided a replicable framework for the quantification of dialogic resonance for the study of Construction Grammar in dialogue. Applied avenues where this may be explored are contexts of First and Second Language Acquisition, (Im)politeness and intercultural communication and neurodivergent interaction (e.g., on the autism spectrum or in contexts of neurocognitive degeneration). Additionally, priming in naturalistic interactions may be studied multimodally, by controlling for gestures, expressions and/or prosody. Future research could also examine how aspectual priming varies typologically across languages and dialects.

**Data availability:** The dataset generated and analysed during the current study is available in the Mendeley Data repository: [Imperfectives in Chinese Callhome and Chinese Callfriend], DOI: 10.17632/pz6tgzyhs2.1 at https://data.mendeley.com/datasets/pz6tgzyhs2/1.

# Appendix



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