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Authors

Zhang, Jingyi

Ji, Yue

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Perspectival Asymmetry in Mandarin Deictic Motion Verbs

Jingyi Zhang (18103308206@163.com)

School of Foreign Languages, Beijing Institute of Technology.
No. 5 Zhongguancun South Street, Beijing, 100081 China

Yue Ji (jiyue@bit.edu.cn)

School of Foreign Languages, Beijing Institute of Technology.
No. 5 Zhongguancun South Street, Beijing, 100081 China

Abstract

Deictic motion verbs require speakers to anchor motion to a perspective, yet the stability of perspective-taking in language use remains unclear. This study examines how Mandarin speakers produce and interpret *lai* ‘come’ and *qu* ‘go’ across twelve person-based conditions, focusing on the theoretically challenging *qu₂* contexts where motion occurs between non-speaker locations. In Experiment 1 (sentence completion), participants sometimes avoided deictic commitment by using the non-deictic verb *dao* ‘arrive’; inappropriate responses were concentrated in *qu₂* contexts as predicted. In Experiment 2 (forced-choice between *lai* and *qu*), overall appropriateness increased, but the same vulnerability of *qu₂* persisted. These results reveal a robust asymmetry: while *lai* remains stable across contexts, *qu* is selectively vulnerable when the speaker is not a spatial anchor. This finding advances our understanding of deixis by highlighting that real-time deictic choice is shaped not only by lexical knowledge, but also by the dynamics of perspective-taking in discourse.

Keywords: deictic motion verbs; Mandarin; asymmetry; perspective shift; spatial language

Introduction

Human language is intrinsically situated: expressions do not describe the world “from nowhere,” but instead anchor referential meaning to the concrete coordinates of a speech context – the roles, locations, and attention of its participants. This referential anchoring is known as deixis, a foundational interface between linguistic form and perspective (Fillmore, 1997). Deictic interpretation requires real-time coordination of spatial, social, and pragmatic information, and thus offers a clear window into how language encodes viewpoint and how speakers manage perspective in communication (Diessel, 2006).

A classic domain of deixis is demonstratives (e.g., English *this/that* and *here/there*; Charney, 1979; De Villiers & De Villiers, 1974; Mandarin *zhe/na*; Chu & Minai, 2013, 2014; Sun, 2021; Tao, 1999). Although often introduced in terms of proximity (the “proximal vs. distal” contrast), demonstrative choice is shaped by more than physical distance. It reflects joint attention, gesture, gaze, discourse accessibility, and speakers’ psychological stance toward the referent (Diessel, 2006; Küntay & Özyürek, 2006; Zhao, 2007; Zhao, 2021). Crucially, the same referent may be referred to with different demonstratives as the deictic center shifts, illustrating how speakers dynamically update perspective. These findings highlight an important generalization: deictic meaning is not

purely geometric but is fundamentally tied to interactional coordination.

Extending this inquiry into dynamic events, deictic motion verbs – such as English *come* and *go* and their Mandarin counterparts *lai* and *qu* – require interlocutors to anchor a moving figure’s path to a perspectival center, typically the speaker. The use of these verbs reveals how spatial perspective is managed in discourse. The present study examines this process in Mandarin, investigating how speakers use *lai* ‘come’ and *qu* ‘go’ across varied spatial and discourse configurations. By comparing spontaneous production with forced-choice responses, we identify where deictic commitments are stable, where they break down, and how the availability of a non-deictic alternative like *dao* ‘arrive’ influences perspective-taking in motion descriptions. In the sections that follow, we first review previous research on deictic motion verbs and then turn to the specific conditions governing *lai* ‘come’ and *qu* ‘go’.

Deictic Motion Verbs

Deictic motion verbs encode motion relative to a reference point. Fillmore’s (1966, 1968) seminal analysis characterizes *come* as motion toward the location of the speaker, the addressee, or a contextually salient “home base,” while *go* designates motion directed away from these deictic centers. Under this view, choosing between deictic motion verbs constitutes a viewpoint commitment: speakers select a verb that signals how a motion event is organized around conversational participants and their locations (Fillmore, 1997). Deictic motion verbs therefore link spatial semantics to pragmatic perspective-taking.

Early studies on English *come* and *go* reveal that even highly frequent basic deictic verbs pose systematic perspectival challenges for correct interpretation. Moreover, previous findings show asymmetries in acquisition and use. For instance, Clark and Garnica (1974) reported more robust performance for *come* (and *bring*) than for *go* (and *take*) in tasks requiring children to track changing conversational roles. Such asymmetries have been linked to semantic markedness: *come* was treated as “positively specified” (presence at the goal) and *go* as “negatively specified” (absence at the goal; see also Clark, 1973, 1974). Subsequent research highlights the role of pragmatic context in supporting appropriate use (Richards, 1976; Tanz, 1980), confirming that deictic motion verbs are intrinsically perspective-dependent. Speakers’ use of these verbs may

reflect not only semantic knowledge but also contextual scaffolding and pragmatic strategies.

Mandarin *lai* ‘come’ and *qu* ‘go’ offer an informative test case for deictic anchoring. Although similar to English *come* and *go*, their usage is governed by subtle interactions among (i) the spatial relation between the figure of motion and the goal, (ii) the locations of the speaker and addressee, and (iii) the pragmatic stability of the deictic center (see more details in the next section). Prior accounts further suggest a markedness asymmetry: *lai* is considered as the unmarked member with broader distribution and higher productivity, whereas *qu* is marked with restricted use (Shen, 1999; Wen, 2007). However, existing analyses rely heavily on intuition, with limited empirical evidence, especially for the use of deictic verbs for motion that involves a third-party figure (Ju, 1992; Qi, 1998; Wen, 2007).

A further complication is that Mandarin offers speakers non-deictic alternatives, most notably *dao* ‘arrive’ which encodes endpoint achievement without explicitly selecting a deictic center. This raises a key question: when speakers avoid *lai* or *qu*, does this signal uncertainty or instability in deictic anchoring, or a strategic preference for neutral viewpoint? Addressing this issue requires elicitation methods that can both capture spontaneous verb choices and, when needed, restrict responses to deictic terms.

Conditions for Using *Lai* ‘Come’ and *Qu* ‘Go’

Previous theoretical work on Mandarin *lai* ‘come’ and *qu* ‘go’ has been somewhat scattered, with various analyses discussing deictic motion verbs in different contexts but lacking a unified framework. To address this, we have integrated key insights from earlier studies (Ju, 1992; Qi, 1998; Wen, 2007) into a more compact and empirically testable framework, which consists of twelve appropriateness conditions for the use of *lai* and *qu* (see Table 1). This person-based framework defines appropriate verb choice based on the spatial relations among the speaker (S), the addressee (A),

and the goal of motion. The default deictic center is anchored to the speaker’s location (see also Qi, 1998; Wen, 2007).

When the speaker (S) is the figure of motion (i.e., the speaker describes his or her own motion with the first-person pronoun *wo* ‘I’), four conditions apply. First, if the speaker has completed movement and is currently at the goal together with the addressee (S3), *lai* ‘come’ is appropriate because the goal coincides with the speaker’s reference point. Second, if the speaker has completed movement and is at the goal while the addressee is not at the goal (S4), *lai* ‘come’ is also appropriate, since the goal still aligns with the speaker’s reference point (Fillmore, 1997; Wen, 2007). Using *qu* ‘go’ would be inappropriate. Third, if the speaker is moving toward a goal where the addressee is located (S1), *qu* ‘go’ is the default choice with the speaker anchored at the deictic center; however, a perspective shift of the deictic center to the addressee can license *lai* ‘come’, often discussed as polite spatial shift (He, 2000; Wen, 2007, as shown in (1)). Fourth, if the speaker is moving toward a goal and the addressee is not at that goal either (S2), *qu* ‘go’ is appropriate (Qi, 1998).

(1) When the addressee is waiting for the speaker at a café, the speaker could say:

a. *Wo mashang qu kafei-dian.* (speaker-centered)

I right away **go** café

“I’m **going** to the café right away.”

b. *Wo mashang lai kafei-dian.* (addressee-centered)

I right away **come** café

“I’m **coming** to the café right away.”

When the addressee (A) is the figure of motion (i.e., the speaker describes the addressee’s motion with the second-person pronoun *ni* ‘you’), we adopt Ju’s (1992) distinction between *qu*₁ (motion away from the speaker’s location) and *qu*₂ (motion between two non-speaker locations). Three conditions apply. If the addressee moves toward the speaker (A1), *lai* ‘come’ but not *qu* ‘go’ is appropriate because the goal coincides with the deictic center (Qi, 1998). If the addressee begins at the speaker’s location and moves away

Table 1: Twelve Conditions Governing *Lai* ‘Come’ and *Qu* ‘Go’.

Person (Figure of motion)		Spatial relation	Appropriate Verb
Speaker (I COME/GO...)	S1	Speaker not at the goal; Addressee at the goal	<i>qu</i> ; <i>lai</i> (perspective shift)
	S2	Neither Speaker nor Addressee at the goal	<i>qu</i>
	S3	Speaker at the goal; Addressee at the goal	<i>lai</i>
	S4	Speaker at the goal; Addressee not at the goal	<i>lai</i>
Addressee (You COME/GO...)	A1	Speaker at the goal; Addressee not at the goal	<i>lai</i>
	A2	Speaker at the source; Addressee not at the goal	<i>qu</i> (<i>qu</i> ₁)
	A3	Speaker at neither the source nor the goal; Addressee not at the goal	<i>qu</i> (<i>qu</i> ₂)
Third party (He/She COME/GO...)	T1	Speaker & Addressee together at the goal	<i>lai</i>
	T2	Speaker & Addressee together not at the goal	<i>qu</i>
	T3	Speaker & Addressee apart; Speaker at the goal	<i>lai</i>
	T4	Speaker & Addressee apart; Addressee at the goal	<i>qu</i> ; <i>lai</i> (perspective shift)
	T5	Speaker & Addressee apart; Neither at the goal	<i>qu</i>

(A2), *qu*₁ is appropriate. If the addressee's motion begins and ends at non-speaker locations (A3), *qu*₂ is appropriate. This last condition is of particular theoretical interest, as it tests anchoring entirely outside the speaker's spatial domain. In both A2 and A3 conditions, *lai* 'come' is inappropriate given that the goal of motion is away from both the speaker and the addressee at the utterance time.

Finally, when a third party is the figure of motion (i.e., the speaker describes the motion of a third party other than the addressee), verb choice depends on whether the third-party's goal coincides with the speaker, the addressee, or neither. Such motion descriptions often arise in contexts where a third party moves to meet the speaker and/or the addressee. Five conditions apply. If the speaker and the addressee are together and the third party moves toward them (T1), *lai* 'come' but not *qu* 'go' is appropriate. If both are together but the third party moves elsewhere (T2), *qu* 'go' rather than *lai* 'come' is appropriate. If the speaker and the addressee are apart and the third party moves toward the speaker (T3), *lai* 'come' is appropriate. If the third party moves toward the addressee while the speaker is elsewhere (T4), *qu* 'go' is the default choice under speaker-centered anchoring, though a shift to the addressee's perspective may license *lai* (Qi, 1998; Wen, 2007, as in (2)). If the third party moves toward a location unrelated to either the speaker or the addressee (T5), *qu* 'go' is appropriate.

- (2) When the speaker informs the addressee about a visit, the speaker may say:
- Xiao-li qu zhao ni le.* (speaker-centered)
Xiaoli **go** meet you SFP
"Xiaoli **goes** to meet you."
 - Xiao-li lai zhao ni le.* (addressee-centered)
Xiaoli **come** meet you SFP
"Xiaoli **comes** to meet you."

These twelve conditions generate clear predictions for *lai* 'come' and *qu* 'go' distributions across different configurations. They also explicitly identify where perspective shift is permissible (notably in S1 and T4) and highlight the critical role of *qu*₂ (A3) as a configuration that challenges speaker-based anchoring. This framework provides the foundation for our experimental materials and hypothesis testing.

The present study

The present study examines how Mandarin speakers use and interpret *lai* 'come' and *qu* 'go' across a range of person and spatial configurations through two experiments, with special attention to configurations that allow perspective shift and *qu*₂ contexts. In Experiment 1, participants had a sentence completion task, which allowed *lai* and *qu*, as well as non-deictic alternatives such as *dao* 'arrive'. In Experiment 2, participants chose between *lai* and *qu* to complete sentences, which could provide a clearer measure of underlying deictic preferences.

Experiment 1

Experiment 1 is an open-ended sentence-completion task. We assess whether participants adhere to predicted *lai* 'come' or *qu* 'go', and investigate where participants would avoid deictic commitment by opting for non-deictic alternatives.

Method

Participants Forty native speakers of Mandarin (age range: 18-21; *M*_{age}=19.48) participated in the experiment. All participants were students recruited from a major university in Beijing, China.

Materials The experiment employed a written sentence-completion task to elicit participants' spontaneous use of the deictic motion verbs *lai* 'come' and *qu* 'go'. The task consisted of 42 critical items to test the twelve conditions detailed in Introduction (Table 1). Each condition corresponded to a distinct spatial configuration involving the speaker, the addressee, and the goal of motion. Three critical items were created for each condition, except for two conditions (A1 and T3). These two conditions were expected to robustly elicit *lai*, and each included six items to balance the overall number of trials that should elicit either *lai* or *qu*.

Each item consisted of a short situational description followed by an incomplete sentence. To avoid lexical priming, the text of the contextual descriptions contained neither *lai* 'come', *qu* 'go', nor other directional verbs such as *dao* 'arrive'. The incomplete sentence has the structure: [Figure of motion as subject] + _____ + [Goal phrase]. Participants filled in a verb they considered appropriate for the described motion event as the example shown below.

- (3) You and your colleague agreed to meet at the company for a training session. But on the morning of the training day, you overslept and hurried out. On the way to the company, you received a call from your colleague who said he was still on the way. You replied over the phone:
- | | | | | |
|---------------|-------------|--------------|--------------|------------------|
| <i>wo ye</i> | <i>gang</i> | <i>chufa</i> | _____ | <i>gongsi,</i> |
| I | also | just | depart | _____ company, |
| <i>dayue</i> | | <i>yao</i> | <i>shiwu</i> | <i>fenzhong.</i> |
| approximately | | need | fifteen | minutes |
- "I just left to _____ to the company as well. It will take about fifteen minutes."

This example was a critical item of Condition S2 (Table 1). The speaker was the figure of motion, and neither the speaker nor the addressee was at the goal. Therefore, the appropriate answer was *qu* 'go'.

To control for potential order effects, the 42 critical items were distributed across eight questionnaire lists, each containing the same items presented in a different pseudo-randomized order. In each list, items of the same condition were separated. Five participants were assigned to each list.

Procedure The experiment was administered online via the Wenjuanxing platform. After accessing the questionnaire link, participants first read an informed consent statement and proceeded only after indicating their agreement to participate. They then completed a brief language background survey, followed by the sentence-completion task. The task took

between 15 and 20 minutes. All responses were automatically recorded by the platform for subsequent coding and analysis. **Coding** Because the task employed an open-ended sentence-completion format, participants produced a range of verbs and verb constructions, including mono-morphemic directional verbs, directional verb complements and serial verb constructions. The responses were coded with the goal of determining whether participants' productions aligned with the theoretically predicted use of the deictic verbs *lai* 'come' and *qu* 'go' in each condition. Therefore, the coding focused on the presence of *lai* 'come', *qu* 'go', or *dao* 'arrive' within each response. Mono-morphemic verb *lai* and constructions such as *gan-lai* 'rush to come' were coded as *lai*, while mono-morphemic verb *qu* and constructions such as *chu-fa-qu* 'set off and go' were coded as *qu*. Constructions containing the non-deictic verb *dao* (e.g., *song-dao* 'send to') were coded as *dao*.

Only the responses coded as *lai* 'come' or *qu* 'go' entered the appropriateness analysis. A response was coded appropriate if the coded verb matched the appropriate deictic verb. Responses were coded as inappropriate if *lai* was produced in a context that licenses *qu*, or vice versa.

For the two conditions that permit perspective shift (Conditions S1 and T4 in Table 1), both *lai* and *qu* were appropriate (as shown in the examples (1)–(2)). For these conditions, the dependent measure was the proportion of responses coded as *lai*, which served as an index of speakers' tendency to adopt a addressee-centered perspective.

Results

Items allowing perspective shift were excluded from appropriateness analyses, yielding 1,440 trials, among which there were 978 appropriate responses (67.92%), 104 inappropriate (7.22%) and 358 responses (24.86%) that involved non-*lai/qu* verbs, most frequently *dao* 'arrive'. Results are shown in Figure 1. The binary data (appropriate vs. inappropriate) were analyzed using logit mixed-effects models. Random intercepts were included for each Participant and each Item (random slopes did not converge; Baayen et al., 2008; Barr, 2008; Barr et al., 2013). We examined the fixed effects of Appropriate Verb (*lai* vs. *qu*), Person (Speaker vs. Addressee vs. Third Party), and their interactions. Fixed-effect estimates are reported in Table 2. The model revealed a significant main effect of Appropriate Verb ($\beta = 3.174$, $z = 2.25$, $p = .025$), indicating that overall participants made fewer inappropriate responses on *qu* than on *lai* items. A better performance was found in the Third-Party configurations ($\beta = 2.002$, $z = 2.02$, $p = .043$) compared with the baseline Speaker configurations. There was also a significant Appropriate Verb $\times$ Person interaction (Addressee: $\beta = -4.083$, $z = -2.43$, $p = .015$; Third Party: $\beta = -4.311$, $z = -2.60$, $p = .009$), indicating that the *lai-qu* contrast differed across figures of motion: compared with the configurations where the speaker described his/her own motion (i.e., "I COME/GO"), the *qu* advantage was reversed in the Addressee and Third-Party conditions, where *qu* items elicited more inappropriate responses than *lai* items.

Crucially, the Addressee conditions included two distinct subtypes of *qu* 'go' with sharply different inappropriate response profiles: *qu*₁ (motion away from the speaker's location) showed fewer inappropriate responses (3.33%), whereas *qu*₂ (motion between two non-speaker locations) had more inappropriate responses (27.5%). In other words, the elevated difficulty for *qu* was driven primarily by *qu*₂.

For the six items that permitted perspective shift, appropriateness was not computed. The proportion of *lai* 'come' responses was 22.08%, indicating that perspective-shift interpretations were available but not dominant.

Turning to non-deictic alternatives, *dao* 'arrive' appeared in 323 trials (about 20% of the total responses). Its distribution showed a clear gradient across person types: Speaker (43.06%) > Addressee (20.21%) > Third Party (11.83%). The pattern of *dao* was also sensitive to the appropriate verb: when *lai* was appropriate, *dao* occurred in 30.95% of trials, whereas the rate dropped to 10.5% for *qu* items. This contrast was strongest when the speaker was the figure of motion: *dao* appeared in 62.92% of *lai* items but only 3.33% of *qu* items. In sum, participants were most likely to use *dao* when describing their own completed motion.

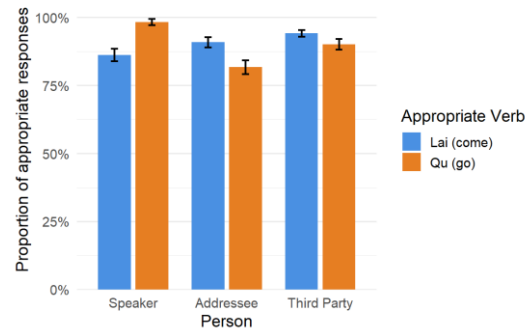


Figure 1: Proportion of appropriate responses for *lai* and *qu* across person conditions in Experiment 1. Error bars represent $\pm$ SEM.

Table 2: Fixed Effects from the GLMM Predicting Appropriateness in Experiment 1.

Predictor	Estimate	SE	z
(Intercept)	1.982	0.815	2.43*
Appropriate Verb	3.174	1.414	2.24*
Person: Addressee	1.275	1.041	1.22
Person: Third Party	2.002	0.991	2.02*
AppropriateVerb $\times$ Addressee	-4.083	1.683	-2.43*
AppropriateVerb $\times$ Third Party	-4.311	1.658	-2.60**

Note. The dependent variable was coded as appropriate (1) vs. inappropriate (0). As for the independent variables, *lai* 'come' and Speaker served as the reference levels.

* $p < .05$, ** $p < .01$.

Discussion

Results show a robust asymmetry between *lai* 'come' and *qu* 'go' that varies by person-based condition (Table 1). When participants described the speaker's own motion (S1–S4), inappropriate responses were the use of *qu* where *lai* was

appropriate. By contrast, when participants described the addressee's motion (A1–A3), the pattern of inappropriate responses reversed: participants increasingly produced *lai* in *qu* trials, driven by *qu*₂ items, suggesting that motion between two non-speaker locations makes deictic anchoring fragile. Another finding concerns the use of the non-deictic verb *dao* 'arrive' which occurred disproportionately in describing one's own movements. This suggests that speakers may avoid deictic commitment by selecting an endpoint-encoding verb that does not require choosing a discourse anchor.

Experiment 2

The results of Experiment 1 revealed asymmetries between *lai* 'come' and *qu* 'go', alongside avoidance of deictic commitment via the neutral verb *dao* 'arrive'. Experiment 2 tested whether the patterns observed in Experiment 1 would persist when participants were prevented from producing non-deictic alternatives. To this end, we adopted a two-alternative forced-choice (2AFC) task in which participants selected either *lai* 'come' or *qu* 'go'.

Method

Participants Another group of forty native speakers of Mandarin (age range: 18–21; $M_{age}=19.15$) participated in the experiment. All participants were students recruited from the same university as in Experiment 1.

Materials The experiment used the same 42 critical items as Experiment 1, but replaced open-ended completion with a forced choice between *lai* 'come' and *qu* 'go' on each trial as shown in the example below.

- (4) You are at Universal Studios with two classmates, Xiaofang and Xiaojie. At lunchtime, you and Xiaofang are eating in the food court when Xiaojie messages to ask where you are. After you share your location, Xiaojie replies that you should stay and he will come over. You then tell Xiaofang:

Xiaojie yao zhao women le.
Xiaojie want look-for us SFP
"Xiaojie will to find us."

Choices: A. *lai* B. *qu*

This example was a critical item of Condition T1 (Table 1). The figure of motion was a third party (Xiaojie), and both the speaker and the addressee (Xiaofang) were at the goal, so the appropriate response was *lai* 'come'.

In addition to the critical items, the experiment included 20 filler items featuring one of four non-deictic directional verbs – *jin* 'enter', *chu* 'exit', *shang* 'ascend', and *xia* 'descend' – with five items per verb. These fillers served two purposes: masking the focus on *lai/qu* and providing an attentional check. As in Experiment 1, eight questionnaire lists were created. In each list, the 42 critical items and 20 fillers were intermixed and presented in a different pseudo-randomized order. Five participants were assigned to each list.

Procedure The experiment was administered online via the same platform as Experiment 1. After informed consent and a language background survey, participants completed the 2AFC task. The task took approximately 15–20 minutes, and

all responses were recorded automatically. Filler accuracy was used as an exclusion criterion: participants scoring below 90% (i.e., more than two filler errors) would have been excluded, but all participants met this criterion and no exclusions were made.

Coding Because participants selected between two options on each critical trial, coding was straightforward: responses matching the appropriate deictic verb were coded as appropriate, and mismatches were coded as inappropriate. As in Experiment 1, the two conditions designed to permit perspective shift (S1 and T4) were analyzed separately. For these items, the dependent measure was the proportion of *lai* 'come' choices as an index of perspective shift.

Results

As in Experiment 1, the six perspective-shift items (240 trials) were excluded, leaving 1,440 analyzable trials. Results are shown in Figure 2. The binary data (appropriate vs. inappropriate) were analyzed with logit mixed-effects modeling including random intercepts for Participant and Item. Fixed effects included Appropriate Verb (*lai* vs. *qu*), Person (Speaker vs. Addressee vs. Third Party), and their interactions (Table 3). The model showed a significant effect of Appropriate Verb ($\chi^2(1) = 4.99, p = .025$). Similar to Experiment 1, participants overall perform better on *qu* items than *lai* items. There was also a significant effect of Person ($\chi^2(2) = 6.08, p = .048$). Performance in both the Addressee and the Third-Party conditions was better compared with the baseline Speaker conditions. Last, a significant Appropriate Verb $\times$ Person interaction was found ($\chi^2(2) = 10.08, p = .006$). Replicating Experiment 1, the significant interaction shows that the *lai-qu* contrast varied by figure of motion: relative to the Speaker conditions, the *qu* advantage was reversed in the Addressee and Third-Party conditions (Appropriate Verb $\times$ Addressee: $\beta = -5.120, z = -3.09, p = .002$; Appropriate Verb $\times$ Third Party: $\beta = -4.494, z = -2.79, p = .005$).

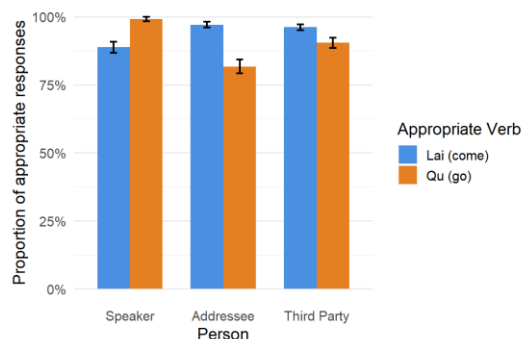


Figure 2: Proportion of appropriate responses for *lai* and *qu* across person conditions in Experiment 2. Error bars represent $\pm$ SEM.

In parallel with Experiment 1, the two subtypes of *qu* 'go' patterned very differently: the *qu*₁ condition (A2) had few inappropriate responses (3.33%), while the *qu*₂ condition (A3) had a much higher proportion of 33.33%. Thus, the overall vulnerability of *qu* could be attributed to *qu*₂ contexts. For the

perspective-shift items, participants selected *lai* on 28.33% of trials, indicating that perspective-shift interpretations were available but not dominant.

Table 3: Fixed Effects from the GLMM Predicting Appropriateness in Experiment 2.

Predictor	Estimate	Std	z
(Intercept)	2.520	0.565	4.46***
Appropriate Verb	3.125	1.398	2.24*
Person: Addressee	1.852	0.878	2.11*
Person: Third Party	1.619	0.771	2.10*
AppropriateVerb× Addressee	−5.120	1.659	−3.09**
AppropriateVerb×Third Party	−4.494	1.609	−2.79**

* $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

Results from the experiment show that the asymmetries observed in Experiment 1 persist when non-deictic alternatives are removed. Although overall performance was high in the 2AFC task, a robust Appropriate Verb × Person interaction was detected. Furthermore, the critical vulnerability of qu_2 (rather than qu_1) was replicated, suggesting that qu_2 contexts where motion occurs entirely outside the speaker's spatial domain pose a challenge to deictic anchoring. Notably, the forced-choice format eliminated the option to neural verbs such as *dao* 'arrive', yet participants still exhibited difficulty with qu_2 , confirming that this difficulty stems from perspectival computation rather than some pragmatic strategy. Finally, occasional *lai* choices in the two perspective-shift conditions indicate that addressee-oriented perspective shift remains available under forced choice, but it is not an obligatory resolution.

General Discussion

The present study provides a systematic experimental investigation of the conditions governing Mandarin deictic motion verbs *lai* 'come' and *qu* 'go' across a full range of person-based configurations. Our findings reveal a robust asymmetry in Mandarin speakers' use of these verbs, with *qu* showing selective vulnerability – particularly in qu_2 contexts where motion occurs between two non-speaker locations. This pattern persists across methodological paradigms, indicating that the difficulty reflects underlying perspectival anchoring rather than mere lexical competition.

The finding that qu_2 contexts are harder (with more inappropriate responses) directly supports and refines Ju's (1992) theoretical distinction between qu_1 and qu_2 . While the inappropriate use of *lai* 'come' in qu_1 contexts (motion away from the speaker) remained largely stable and low (about 3%) in both experiments, that in qu_2 contexts (motion between non-speaker locations) was markedly higher (around 30%). This suggests that the markedness asymmetry often attributed to *qu* (Shen, 1999) is not a global property of the verb, but is localized to configurations where the speaker is excluded from the spatial frame under discussion. This finding aligns with broader cognitive accounts of perspective-taking which posit that maintaining a deictic center is more demanding

when the speaker is not a participant in the described event (Levinson, 2003; Tenbrink, 2007). The qu_2 configuration essentially requires speakers to compute a motion vector relative to a *non-present* anchor, imposing a higher cognitive load that may lead to avoidance or substitution with the more accessible *lai* 'come'.

The strategic use of the non-deictic verb *dao* 'arrive' in Experiment 1 further illuminates how speakers manage perspectival demands. The gradient in *dao* usage – highest in the *lai* contexts (62.92%) and lowest in the *qu* contexts (3.33%) where the speaker is the figure of motion – suggests that speakers take a pragmatic strategy to avoid incorporating perspective into their motion descriptions when viewpoint commitment is complex or socially delicate (Brown & Levinson, 1987; He, 2000). This finding expands our understanding of deictic flexibility: speakers not only shift perspective (as in S1 and T4 contexts) but can also opt out of the deictic system, choosing a semantically neutral form that conveys resultative meaning without anchoring (Slobin, 2004; Talmy, 2000). This strategy underscores the interaction between semantic encoding and pragmatic economy in real-time language production.

Theoretical implications of our study are twofold. First, our data challenge purely geometric or speaker-centric models of deixis, demonstrating that verb choice is sensitive to other factors, especially participant roles and perspectival flexibility. Second, the persistence of the *lai/qu* asymmetry under forced-choice conditions suggests that speakers possess stable semantic representations of the verbs, but that real-time processing is influenced by the accessibility of the deictic center (Kibrik, 2011). This aligns with psycholinguistic models where perspective-taking is a dynamic process subject to interference and competition (Keysar et al., 2000; Wardlow Lane et al., 2006).

Finally, the present findings open several directions for future research. Developmental studies are needed to examine how children acquire the *lai/qu* contrast and learn to anchor motion in qu_2 contexts, which may follow a prolonged developmental trajectory similar to that of complex perspective-taking in other domains (Pyers & Senghas, 2009). Cross-linguistic comparisons with languages that have richer or poorer deictic motion systems (e.g., Spanish vs. Turkish) could further elucidate the role of typology in perspectival encoding (Filipović, 2007; Özyürek & Kita, 1999). Additionally, real-time methods such as eye-tracking could probe the cognitive mechanisms underlying qu_2 vulnerability, testing whether it stems from retrieval difficulty, perspective simulation failure, or inhibitory control demands.

In conclusion, the present study demonstrates that deictic motion verbs are a revealing locus for studying perspectival anchoring in language. The selective fragility of Mandarin *qu* – especially in configurations that exclude the speaker – highlights the intricate interplay between spatial semantics, social cognition, and pragmatic strategy in everyday language use.

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References

- Baayen, R. H., Davidson, D. J., & Bates, D. M. (2008). Mixed-effects modeling with crossed random effects for subjects and items. *Journal of Memory and Language*, 59(4), 390–412.
- Barr, D. J. (2008). Analyzing ‘visual world’ eye-tracking data using multilevel logistic regression. *Journal of Memory and Language*, 59(4), 457–474.
- Barr, D. J., Levy, R., Scheepers, C., & Tily, H. J. (2013). Random effects structure for confirmatory hypothesis testing: Keep it maximal. *Journal of Memory and Language*, 68(3), 255–278.
- Brown, P., & Levinson, S. C. (1987). *Politeness: Some universals in language usage*. Cambridge University Press.
- Charney, R. (1979). The comprehension of ‘here’ and ‘there.’ *Journal of Child Language*, 6(1), 69–80.
- Chu, C.-Y., and Minai, U. (2013). Examining the Role of Theory of Mind and Executive Function in the First Language Acquisition of Demonstratives. Poster presentation at the 38th Boston University Conference for Language Development, Boston, MA.
- Chu, C. Y., & Minai, U. (2014). Comprehension of the demonstratives by Chinese-speaking preschool children. In *Proceedings of the 14th International Symposium on Chinese Languages and Linguistics* (pp. 109-123).
- Clark, E. V. (1973). What’s in a word? On the child’s acquisition of semantics in his first language. In *Cognitive development and acquisition of language* (pp. 65-110). Academic Press.
- Clark, E. V., & Garnica, O. K. (1974). Is he coming or going? On the acquisition of deictic verbs. *Journal of Verbal Learning and Verbal Behavior*, 13(5), 559–572.
- De Villiers, P. A., & De Villiers, J. G. (1974). On this, that, and the other: Nonegocentrism in very young children. *Journal of Experimental Child Psychology*, 18(3), 438–447.
- Diessel, H. (2006). Demonstratives, joint attention, and the emergence of grammar. *Cognitive Linguistics*, 17(4).
- Fillmore, C. J. (1966). Deictic categories in the semantics of ‘come’. *Foundations of language*, 219-227.
- Fillmore, C. J. (1968). Toward a theory of deixis.
- Fillmore, C. J. (1997). *Lecture on Deixis*. Stanford: CSLI Publications.
- Filipović, L. (2007). *Talking about motion: A crosslinguistic investigation of lexicalization patterns*. John Benjamins Publishing.
- He, Z. X. (2000). *A New Introduction to Pragmatics*. Shanghai Foreign Language Education Press.
- Ju, H. (1992). The semantic and grammatical features of Chinese directional verbs and verb phrases. *Chinese Teaching in the World*, (4), 276-282.
- Keysar, B., Barr, D. J., Balin, J. A., & Brauner, J. S. (2000). Taking perspective in conversation: The role of mutual knowledge in comprehension. *Psychological Science*, 11(1), 32–38.
- Kibrik, A. A. (2011). *Reference in discourse*. Oxford University Press.
- Küntay, A. C., & Özyürek, A. (2006). Learning to use demonstratives in conversation: What do language specific strategies in Turkish reveal? *Journal of Child Language*, 33(2), 303–320.
- Levinson, S. C. (2003). *Space in language and cognition: Explorations in cognitive diversity*. Cambridge University Press.
- Özyürek, A., & Kita, S. (1999). Expressing manner and path in English and Turkish: Differences in speech, gesture, and conceptualization. In M. Hahn & S. C. Stoness (Eds.), *Proceedings of the 21st Annual Conference of the Cognitive Science Society* (pp. 507–512). Lawrence Erlbaum Associates.
- Pyers, J. E., & Senghas, A. (2009). Language promotes false-belief understanding: Evidence from learners of a new sign language. *Psychological Science*, 20(7), 805–812.
- Qi, H. Y. (1996). The pragmatic meaning of subjective reference “lai/qu” in spatial displacement. *Chinese Teaching in the World*, (4), 56–65.
- Richards, M. M. (1976). Come and go reconsidered: Children’s use of deictic verbs in contrived situations. *Journal of Verbal Learning and Verbal Behavior*, 15(6), 655–665.
- Shen, J. X. (1999). *Asymmetry and Markedness Theory*. Nanchang: Jiangxi Education Publishing House.
- Slobin, D. I. (2004). The Many Ways to Search for a Frog: Linguistic Typology and the Expression of Motion Events. In S. Strömquist & L. Verhoeven (Eds.), *Relating events in narrative, Vol. 2. Typological and contextual perspectives* (pp. 219–257). Lawrence Erlbaum Associates Publishers.
- Sun, X. (2021). A Study of Children’s Acquisition of the Deixis in Chinese Mandarin: Asymmetry Distribution of “zhe”, “zhege” and “na”, “nage” between Positions of Subject and Object. In *2021 3rd International Conference on Literature, Art and Human Development (ICLAHD 2021)* (pp. 473-479). Atlantis Press.
- Talmy, L. (2000). *Toward a cognitive semantics, Vol. II: Typology and process in concept structuring*. MIT Press.
- Tanz, C. (1980). Studies in the acquisition of deictic terms. *Cambridge Studies in Linguistics London*, 26, 1-184.
- Tao, H. Y. (1999). The grammar of demonstratives in Mandarin conversational discourse: A case study. *Journal of Chinese Linguistics*, 27(1), 69–103.
- Tenbrink, T. (2007). *Space, time, and the use of language: An investigation of relationships*. Mouton de Gruyter.
- Wardlow Lane, L., Groisman, M., & Ferreira, V. S. (2006). Don’t talk about pink elephants! Speakers’ control over leaking private information during language production. *Psychological Science*, 17(4), 273–277.

- Wen, X. (2007). Pragmatic meaning and deictic conditions of the motion verbs *lai* and *qu*. *Foreign Language Teaching and Research*, 39(2), 91–96.
- Zhao, L., & Zou, L. (2021). Demonstrative reference and cognitive space: A memory game on mandarin-speaking children. *International Journal of Linguistics*, 13(2), 12–26.
- Zhao, Y.-J. (2007). Children's acquisition of demonstrative pronouns in mandarin chinese. *PACLIC 21 - The 21st Pacific Asia Conference on Language, Information and Computation, Proceedings*, 532–541.