‘I sometimes still get my tenses wrong’:

Insights from studies on the interaction between lexical and grammatical aspect

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Presented at AILA 2011

Beijing University of Foreign Studies
Tense-aspect asymmetry in SLA contexts

- Second language learners often switch tenses in ‘non-native’ ways, as illustrated in the following example from Bardovi-Harlig (2000).

- The police **left** the man and **caught** the women. *The man **wants** go to the prison because he **is** very poor and he **sleep** on the street every day. After that he **went** to the restaurant and **took** food for eating.* (Learner E4)
An interesting question is whether there is some regular pattern to these ‘non-native’ shifts in tenses. If the answer is yes, the next question is why.

In this paper, we examine two major strands of research with convergent findings, namely, language acquisition research and language processing studies.

Both strands of studies reveal biases in the relationships between tense-aspect marking and verb type — the former referred to as ‘grammatical aspect’ and the latter as ‘lexical aspect’.
An event is necessarily located in time.
We locate time in a number of ways.

- **Using adverbs of time:**
  - Once upon a time, last week, this morning

- **Using adverbs of sequence:**
  - First, then, lastly

- **Using tense markers:**
  - -ed, -s, will/shall

- **Using aspect markers:**
  - -ed, have V-en, be V-ing

- **Types of aspect:**
  - Lexical aspect
  - Grammatical aspect

The primary function of aspect markers is not temporal location.
Temporal frames in English narratives:

- **Establish** TF
- **Maintain** TF
- **Switch** TF
- **Switch** TF
- **Re-establish** TF

Andersen (1990)

- **Last week** my nephew **came** home all excited.
- He **rushed** into the house brimming with news.
- He **had just lost** his first front tooth.
- And he **had pulled it out** himself!
- His mouth **was now wide open**, and indeed his left upper tooth **was gone**, and the gum **was still bleeding** slightly.
- “Wow, Adrian, you **are** such a brave boy!” I **could see** he **was** very proud of himself, and he **had** every reason to be proud of course.
- I **then accompanied** him to the bathroom to get some gauze to clean up his slightly bleeding gum.
Temporal frames (TF) in Mandarin narratives

- **Establish TF** ~ temporal adverbs
- **Maintain TF** ~ bare verbs, aspect markers
- **Switch TF** ~ temporal adverbs, perfect aspect
- **Re-establish TF** ~ temporal adverbs

Lexical aspect can provide implicit temporal information

Grammatical aspect provides explicit temporal information
Aspectual system

Lexical aspect
(situation aspect)

Grammaratical aspect
(viewpoint aspect)

Perfective

Imposes a bounded vs. unbounded perspective to an event or situation

Imperfective

e.g. He made a cake.
e.g. He is making a cake.
He was making a cake.
Aspectual system

Lexical aspect
(situation aspect)

Grammatical aspect
(viewpoint aspect)

e.g. *He climbed up the roof.*

e.g. *He climbed among the rocks.*
Aspectual system

Lexical aspect
(situation aspect)

Grammatical aspect
(viewpoint aspect)

e.g. He *climbed up the roof*.

e.g. He *climbed among the rocks*. 
Once upon a time, there lived an old woman deep in the forest of Wushu.

One day, the woman was gathering wood some distance from her cottage.

When she was done gathering, she bundled the wood together, and headed home.

On the way home, she tripped and fell.
Situation types (lexical aspect) and their temporal properties

(Smith 1991)

<table>
<thead>
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<th>Telic</th>
<th>Examples</th>
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<td>-</td>
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*iterative*
‘Defective Tense’ Hypothesis

- Children at first cannot handle tense, which involves temporal reference relative to speaker time.

- Children’s cognitive development initially focus on the ‘here and now’.
• ‘Aspect First’ Hypothesis

• Children first attend to aspect.

• They pay attention to change of state, and initially use –ed to mark completion (hence perfective aspect) rather than past temporal reference.
• **Acquisition of aspect in Chinese**
  • Children first attend to aspect (perfective *le*) before modals (Erbaugh 1982).
  • They also pay attention to **change of state**, and tend to acquire perfective aspect earlier than imperfective aspect.
  • Mandarin-speaking children first acquire **perfective le** (Erbaugh 1982; Li 1990; Liu 2009), then **progressive zai** and **durative zhe** before they acquire **experiential guo** (Lin 1986).

• There is an asymmetry in the acquisition of perfective vs. imperfective aspect marking.
• Erbaugh (1982) examined data from children aged 2-3; children in Li’s (1990) data ranged from 3;11 to 6;4, and those in Liu’s (2009) from 1;9.10 to 2;2.7.

Children’s initial *le* is also used to mark completion rather than past temporal reference.
Aspect Hypothesis
(Shirai 1991; Andersen & Shirai 1996)

1. Learners first use past marking on achievement and accomplishment verbs, eventually extending use to activities and statives.

Past marking: ACH and ACC > ACT > STA

2. In languages that encode the perfective/imperfective distinction, imperfective past appears later than perfective past, and imperfective past marking begins with statives, extending next to activities, then to accomplishments, and finally to achievements.
3. In languages that have progressive aspect, progressive marking begins with activities, then extends to accomplishments and accomplishments, and finally to achievements.

**Progressive marking:**

\[ \text{ACT} > \text{ACC and ACH} > \ast \text{STA} \]

4. Progressive markings are not incorrectly overextended to statives.
Adult language learners sometimes make these ‘errors’.

- The police *left* the man and *caught* the women.

The man *wants* to go to the prison because he *is* very poor and he *sleep* on the street every day. After that he *went to the restaurant* and *took food* for eating.

[Learner E4, Bardovi-Harlig 2000]
Why do language learners make these ‘errors’?

- The police *left* the man and *caught* the women.
  (ACHIEVEMENT, past)  (ACHIEVEMENT, past)

The man *wants* to go to the prison because he *is* very poor
  (STATE, present)  (STATE, present)

and he *sleeps* on the street every day. After that
  (ACTIVITY, base form)

he *went to the restaurant* and *took food* for eating.
  (ACCOMPLISHMENT, past)  (ACCOMPLISHMENT, past)
Table 1. Distribution of tense-aspect morphology within aspectual categories in written narratives by learners of English in 7 proficiency groups (Bardovi-Harlig 1998)

<table>
<thead>
<tr>
<th>Group</th>
<th>Form</th>
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<th>Activities</th>
<th>Accomplishments</th>
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Comparison of within-category analysis of the distribution of simple past in written narratives by learners of English (Bardovi-Harlig 1998)
Comparison of within-category analysis of the distribution of simple past in oral narratives by learners of English (Bardovi-Harlig 1998)
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<th>Accomplishments %</th>
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Table 3. Across-category analysis of the distribution of tense-aspect morphology in written narratives by learners of English in 7 proficiency groups (Bardovi-Harlig 2002) “What percent of past tense marking occurs on X?” where X could be States, Activities, Accomplishments or Achievements.
Sample of an across-category analysis of the distribution of tense-aspect morphology in written narratives

<table>
<thead>
<tr>
<th>Group</th>
<th>Form</th>
<th>States</th>
<th>Activities</th>
<th>Accomplishments</th>
<th>Achievements</th>
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</table>


Comparison of within-category and across-category analyses of the distribution of simple past in oral narratives by learners of English (Bardovi-Harlig 2000)

within-category analysis

across-category analysis

Recall the predictions of the Aspect Hypothesis.

Past marking is acquired in the following sequence:

ACH > ACC > ACT > STA
Findings from acquisition studies

- L1 acquisition studies reveal that children acquiring English tend to use past marking (*-ed and irregular past forms) on achievement and accomplishment verbs first, then activity verbs, and finally state verbs.

  **PAST MARKING:**  \textit{Achievement & Accomplishment} > Activity > State

  e.g. Shirai & Andersen (1995); Andersen & Shirai (1996)

- A similar tendency has also been observed in L2 acquisition.

  e.g. Bardovi-Harlig (1998, 2000)

- These studies further show that progressive marking (*be + -ing*) follows a different sequence of development across verb types: the progressive form tends to first appear on activity verbs, then accomplishment and achievement verbs, and rarely ever on stative verbs.

  **PROGRESSIVE MARKING:** \textit{Activity} > Achievement & Accomplishment > */? State
Aspectual asymmetry in processing and acquisition

- These differences in accuracy and rate of acquisition in both L1 and L2 emerge as a result of biases/asymmetries in the strengths of combination between grammatical aspect (perfective/past vs. imperfective/progressive marking) and lexical aspect (verb type: ACH, ACC, ACT, ST, …).

- Similar biases or asymmetrical effects in the interaction between grammatical aspect and lexical aspect have also been observed in other languages.

  e.g. Japanese, Chinese, and Spanish
  (see for example Li & Shirai 2000; Salaberry & Shirai 2002)
There’s asymmetry in the acquisition of aspect marking—past is acquired earlier on ACH (and ACC) verbs.

And progressive is acquired earlier on ACT verbs.

Is there a cognitive basis for the observed aspectual asymmetry in language acquisition?

Can this bias be empirically tested?
Comprehension / Memory recall task

- Participants were asked to read English passages and to then decide if target verb phrases (either perfective or imperfective) appeared in those narratives.
Magliano & Schleich (2000)

Participants read narrative sentences 
(perfective or imperfective)

Introduction
Aspect sentences
Post-aspect sentences
Conclusion
Critical question

Respond to yes-no question
(judgment on the basis of whether the event was ongoing or completed)
Step 1: Participants read narrative sentences (perfective or imperfective)

Jack’s wife Betty was expecting a baby, and boy was he excited. He was planning to be her coach when she gave birth. He went to all the Lamaze classes. Every night, Jack made Betty practice her breathing. Finally, the big night was here.

Betty was delivering their first child. OR Betty delivered their first child.

Jack fainted dead on the spot. The video recorder went crashing on the ground.

Step 2: Respond to yes-no question (judgment on the basis of whether the event was ongoing or completed)

Has the baby been born yet?
Comprehension / Memory recall task

- Participants were asked to read English passages and to then decide if target verb phrases (either perfective or imperfective) appeared in those narratives.

Results

- Participants responded significantly faster to imperfective verb phrases than to perfective ones.

Conclusion

- Faster recognition time for imperfective verbs was attributed to their slower decay rate, which allows for longer activation and retention in working memory.
Verbs with **imperfective** markers are more likely to be perceived as **ongoing** in the subsequent context.

They were **walking to school**.

Often perceived as still walking.
Verbs with perfective markers are more likely to be perceived as completed in the subsequent context.

They walked to school.

Often perceived as completed.
Memory of verbs with **imperfective** marking decay at a slower rate.

*She was writing a letter.*

*She wrote a letter.*
There is a strong correlation between aspectual asymmetries and discourse grounding functions.

(Hopper 1979)

She was writing a letter.

She wrote a letter.
Discourse implications:

**Imperfective verbs** ~ slower decay rate ~ background situation

**Perfective verbs** ~ faster decay rate ~ foregrounded events

*While she was writing a letter, E₁..., E₂..., E₃...*  

*She wrote a letter.*
Imperfective verbs ~ slower decay rate ~ background situation
Perfective verbs ~ faster decay rate ~ foregrounded events

While she was writing a letter, $E_1\ldots, E_2\ldots, E_3\ldots$

She wrote a letter.
Imperfective verbs  ~ slower decay rate  ~  background situation
Perfective verbs  ~ faster decay rate  ~  foregrounded events

While she  was writing  a letter,  $E_1\ldots, E_2\ldots, E_3\ldots$

She  wrote  a letter.
Imperfective verbs ~ slower decay rate ~ background situation
Perfective verbs ~ faster decay rate ~ foregrounded events

$E_1$, ..., $E_2$, ..., $E_3$...
Betty had delivered their first child.
Imperfective verbs ~ slower decay rate ~ background situation
Perfective verbs ~ faster decay rate ~ foregrounded events

$E_1, E_2, E_3, \ldots$
Betty was delivering their first child.

Has the baby been born yet?

Target Sentence

Critical Question

$T_1 \rightarrow T_n$
Sentence completion task

– Participants were asked to complete sentence fragments containing either perfective or imperfective verb phrases

*The cow* had grazed __________

vs.

*The cow* was grazing __________

*The fire* had burned __________

vs.

*The fire* was burning __________
Strong association between imperfective aspect and locations and perfective aspect with patients (Ferretti, Kutas & McRae 2007)

Figure 1. Verb aspect, thematic roles, and their general relationship with the temporal and causal structure of events.
Feretti, Kutas & McRae (2007)

• The fire *had burned* ________________________________.

• The fire *was burning* ________________________________.

- Perfective aspect
- Imperfective aspect

- Highlights patient affectedness, etc.
- in the house

- Locative prepositional phrases—highlighting attention to the internal contour of the event
- the house
Strong association between imperfective aspect and locations and perfective aspect with patients (Ferretti, Kutas & McRae 2007)

Table 2
Percentage of Verb Phrase Preferences for Verbs Marked With Imperfective and Perfect Aspect in Experiment 2

<table>
<thead>
<tr>
<th>Phrase type</th>
<th>Imperfective</th>
<th></th>
<th>Perfect</th>
<th></th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SE</td>
<td>M</td>
<td>SE</td>
<td></td>
</tr>
<tr>
<td>Preposition (other)</td>
<td>13</td>
<td>2</td>
<td>14</td>
<td>2</td>
<td>−1</td>
</tr>
<tr>
<td>Preposition (locative)</td>
<td>37</td>
<td>3</td>
<td>28</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Noun</td>
<td>38</td>
<td>4</td>
<td>43</td>
<td>4</td>
<td>−5</td>
</tr>
<tr>
<td>Adverb</td>
<td>9</td>
<td>1</td>
<td>12</td>
<td>1</td>
<td>−3</td>
</tr>
<tr>
<td>Conjunction</td>
<td>2</td>
<td>0.4</td>
<td>3</td>
<td>0.5</td>
<td>−1</td>
</tr>
</tbody>
</table>
Sentence completion task

- Participants were asked to complete sentence fragments containing either perfective or imperfective verb phrases

- *The cow had grazed ____ vs. The cow was grazing ____*
- *The fire had burned ____ vs. The fire was burning ____*

Results

- Participants produced more *locative* prepositional phrases (e.g. *The fire was burning in the kitchen*) for *imperfective* sentence fragments.
- For *perfective* sentence fragments, participants tended to produce *noun* phrases that identify *affected patients* (e.g. *The fire had burned the house*).

Conclusion

- Participants appear to be sensitive to event knowledge—that is, they tend to associate ongoing events (marked by imperfective aspect) with locative prepositional phrases, and completed events (marked by perfective aspect) with noun phrases denoting affected entities.
Comprehension task using ERP measures

- Participants were asked to read perfective and imperfective sentence fragments with typical vs. atypical locations.

  - Typical location: \textit{cook in the kitchen}
  - Atypical location: \textit{cook in the museum}
Feretti, Kutas & McRae (2007)

- cooked in the kitchen
- cooked in the museum
- was cooking in the kitchen
- was cooking in the museum

Typical location

Atypical location
Electrode caps for ERP experiments
ERP experiment—testing for possible semantic violations

Cooked in the museum
Cooking in the museum
Cooked in the kitchen
Cooking in the kitchen
Figure 2. Experiment 3 grand averages (n = 28) for the 4 experimental conditions at all 26 electrode sites.

- High probability location, imperfective aspect
- Low probability location, imperfective aspect
- High probability location, perfect aspect
- Low probability location, perfect aspect
N400 measures semantic violations

Significant difference in N400 readings between high and low probability location for imperfective aspect

Non-significant difference for perfective aspect
Feretti, Kutas & McRae (2007)

- cooked in the kitchen
- cooked in the museum
- was cooking in the kitchen
- was cooking in the museum

**Perfective aspect**
- No significant N400 amplitude
  - Typical location
  - Atypical location

**Imperfective aspect**
- Significant N400 amplitude—highlighting attention to internal details of the event, e.g. location of ongoing action
Comprehension task using ERP measures

Results

- Atypical locations elicited a higher N400 amplitude than typical locations for events denoted by verbs marked with imperfective aspect (e.g. *was cooking*).
- For verbs marked with perfective aspect (e.g. *had cooked*), no significant difference was found.

Conclusion

- Participants are more sensitive to subtle differences in locative interpretations when processing imperfective sentences, but not perfective ones.
- This is consistent with our understanding that imperfective sentences highlight the internal and unbounded view of an event (inclusive of its locative details), while perfective sentences highlight instead an external and bounded view that pays more attention to result or patient affectedness than to locus of action.
Sentence-picture matching task

- Participants were asked to listen to sentences (either perfective or imperfective) and then match them to ongoing or completed pictures.
Predicted aspectual asymmetry:
Perfective sentences are faster with ACC verbs; Imperfective sentences are faster with ACT verbs.

**Imperfective**
e.g. ?English –*ing
Cantonese *gan2

**Perfective**
e.g. ?English –*ed
Cantonese *zo2
Predicted interaction effects: grammatical aspect and lexical aspect

**Imperfective**
Sentence matched with Ongoing Picture

**Perfective**
Sentence matched with Completed Picture
Why choose Cantonese, not English?

English – *ed* and *be + -ing* show conflation between aspect and tense.
Cantonese aspectual system

- Perfective
  - Compleitive
    - "jyun4"
  - Experiential
    - "gwo3"
  - Perfect(ive)
    - "zo2"
- Imperfective
  - Locative/Progressive
    - "hai2dou6"
  - Progressive
    - "gan2"

State | Activity | Accomplishment | Achievement

Predicted interaction between lexical aspect (verb type) and grammatical aspect.
Lexical aspect in Cantonese

(1) **Accomplishment** (ACC): [+dynamic] [+durative] [+telic]

寫封信
*se2 fung1 seon3*
write CL letter
‘write a letter’

(2) **Activity** (ACT): [+dynamic] [+durative] [-telic]

聽音樂
*teng1 jam1ngok6*
listen music
‘listen to music’
Lexical and grammatical aspect in Cantonese

(1) **Accomplishment (ACC):** [+dynamic] [+durative] [+telic]

個男仔寫緊封信

*go3 naam4zai2 se2-gan2 fung1 seon3*

CL boy write-IMPF CL letter

‘The boy is writing a letter’

個男仔寫佐封信

*go3 naam4zai2 se2-zo2 fung1 seon3*

CL boy write-PERF CL letter

‘The boy has written a letter’

(2) **Activity (ACT):** [+dynamic] [+durative] [-telic]

個男仔聽緊音樂

*go3 naam4zai2 teng1-gan2 jam1ngok6*

CL boy listen-IMPF music

‘The boy is listening to (some) music’

個男仔聽佐音樂

*go3 naam4zai2 teng1-zo2 jam1ngok6*

CL boy listen-PERF music

‘The boy has listened to some music’
Reaction Time Study
A. Presentation of either a perfective or imperfective sentence (auditory form):

個男仔彈緊琴
$go3 \ naam4zai2 \ taan4gan2 \ kam4$
CL boy play-IMPF piano
‘The boy is playing the piano.’

B. Presentation of a pair of pictures depicting ongoing versus completed events:

C. Decision of which picture matches the utterance by pressing a corresponding key on the computer keyboard.
Participants hear a **perfective** or **imperfective** utterance.
Sentence-and-picture matching task
ACTIVITY VERBS

Participants hear a perfective utterance on the screen
個男仔游佐水
Go3 laam4zai2 jau4 zo2 seoi2
‘The boy has finished swimming.’

Participants hear an imperfective utterance on the screen
個男仔游緊水
Go3 laam4zai2 jau4 gan2 seoi2
‘The boy is swimming.’
Table 5. **Mean Accuracy Rates** (in Percentages) for Matched Perfectives and Matched Imperfectives in a Sentence-Picture Matching Task

<table>
<thead>
<tr>
<th>Type of analysis</th>
<th>Grammatical aspect</th>
<th>Lexical aspect (verb type)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Activity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
</tr>
<tr>
<td>Subject analysis</td>
<td>Perfective</td>
<td>96.1</td>
</tr>
<tr>
<td></td>
<td>Imperfective</td>
<td>98.2</td>
</tr>
<tr>
<td>Item analysis</td>
<td>Perfective</td>
<td>96.1</td>
</tr>
<tr>
<td></td>
<td>Imperfective</td>
<td>98.2</td>
</tr>
</tbody>
</table>

*Note.* Perfective facilitation for accomplishments and imperfective facilitation for activities (for both subject and item analyses) $p < .05$
Table 6. **Mean Reaction Times** (in Milliseconds) for Matched Perfectives and Matched Imperfectives in a Sentence-Picture Matching Task

<table>
<thead>
<tr>
<th>Type of analysis</th>
<th>Grammatical aspect</th>
<th>Lexical aspect (verb type)</th>
<th>Activity</th>
<th>Accomplishment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Subject analysis</td>
<td>Perfective</td>
<td></td>
<td>1086</td>
<td>198</td>
</tr>
<tr>
<td></td>
<td>Imperfective</td>
<td></td>
<td>980</td>
<td>172</td>
</tr>
<tr>
<td>Item analysis</td>
<td>Perfective</td>
<td></td>
<td>1084</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>Imperfective</td>
<td></td>
<td>988</td>
<td>145</td>
</tr>
</tbody>
</table>

*Note.* Interaction effect between lexical and grammatical aspect (for both subject and item analyses) $p < .001$
Yap, Chu, Yiu, Wong, Kwan, Tan, Matthews, Li & Shirai (2009)

**Sentence-picture matching task**

**Results**
- Participants matched *ongoing* pictures significantly faster for *activity* verbs with *imperfective* aspect.
- Participants matched *completed* pictures significantly faster for *accomplishment* verbs with *perfective* aspect.

**Conclusion**
- *Grammatical aspect interacts with lexical aspect during sentence processing.*
Findings

- Lexical aspect (i.e., verb type) interacts with grammatical aspect in the course of language processing.
  - Participants respond to **progressive gan2** more accurately and faster for **activity** verbs compared to accomplishment verbs.
  - They respond to **perfective zo2** more accurately and faster for **accomplishment** verbs.
- This suggests that certain combinations of verb type and grammatical aspect produce stronger neural activations and are processed as well as acquired faster.
- In terms of language production, the **weak/strong combinations of verb type and grammatical aspect** help explain why certain ‘past tense errors’ persist longer than others.
Some ‘errors’ that take much longer to fix.

- The police *left* the man and *caught* the women.

The man *wants* go to the prison because he *is* very poor and he *sleep* on the street every day. After that he *went to the restaurant* and *took food* for eating.

[Learner E4, Bardovi-Harlig 2000]
Interpreting the results in terms of Barsalou’s (1999) perceptual theory of knowledge

• Perceptual input (including linguistic input, such as aspectual information) contributes to the formation of situation models.
• Each perceptual input activates a configuration of neurons and leaves a trace of these neuronal activations, which is encoded in memory as a perceptual symbol.
• Perceptual symbols interact with each other, particularly in associative areas of the brain, and can give rise to complex cognitive processes.
• Manipulations of perceptual symbols can support hierarchical representations of knowledge, giving rise to symbolic-style logical thinking and inferential thought.
• Not only can perceptual symbols contribute to the formation of situation models in bottom-up fashion, they also can do so in top-down fashion.
• Top-down processing happens, for example, when perceptual symbols influence the interpretation of new incoming perceptual input.
Interaction of lexical and grammatical input

• Within this framework of perceptual symbols, a sentence will activate a
dynamic series of neural configurations that give rise to a situation model
of the concept represented by the sentence, including the temporal
information conveyed by its verb type (e.g., activity or accomplishment).

• The additional presence of a grammatical aspect marker (e.g., progressive
imperfective gan2 or perfective zo2 in Cantonese) also activates its own
neural activation configuration, which will interact with the neural
configuration of the verb type (i.e., lexical aspect).

• Together, they produce a nuanced temporal characterization of the situation
being described in the sentence.

• Neural activations that reinforce each other are processed more rapidly—
hence, the aspectual facilitations observed for imperfective–activity
combinations and perfective–accomplishment combinations in this study.
Within the perceptual symbol framework, frequent co-activations of neural configurations also give rise to stronger connectivity (Hebbian style), which, in turn, also facilitates processing speed.

More important, as was suggested in Barsalou (1999), frequent associations can give rise to symbols that can serve as attention-attuning devices.

They contribute to top-down processing, particularly in associative areas in the brain.

Of the two types of aspect examined in this study, grammatical aspect markers (perfective and imperfective) serve the more symbolic function, each attuning attention in working memory on certain temporal profiles of the situation depicted by the verb types (whether activity or accomplishment).
Emergence of symbolic (or grammatical) markers

- Viewed from a language evolution perspective, the more symbolic status of grammatical aspect markers emerges from a diachronic process of grammaticalization (e.g. Bybee, Perkins, & Pagliuca, 1994; Hopper & Traugott, 2003), whereby certain verbs with high-frequency usage become bleached of much of their original lexical meaning (in large part, due to metonymic and metaphorical extension), retaining mostly some core temporal features such as *ongoingness* (imperfective) or *boundedness/completedness* (perfective).

- As these verbs become semantically light, they begin to be attached to other verbs to highlight certain temporal characteristics of the situation. In time, these light verbs evolve into dedicated grammatical aspect markers, with the top-down symbolic function of attuning attention in working memory to certain temporal interpretations (e.g., ongoing focus or endpoint focus).
References


Acknowledgments

RGC Competitive Earmarked Research Grant, Hong Kong
RGC CERG CUHK 4711h/05

Project Title: Aspectual Asymmetries in the Human Mind: Evidence from Reaction Time Studies

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