Aspectual asymmetries in Cantonese: 

Does inherent aspect matter?

Yap Foong Ha, Patrick Chu, Stella Wong, Emily Yiu, Stephen Matthews & Yasuhiro Shirai

Chinese University of Hong Kong
University of Hong Kong,
Cornell University
Acknowledgements

Computer Technicians

- Chow Lai Chim

Research Assistants

- Stella Kwan
- Irene Lam
- Jennifer Leung
- Selena Tam

Artist

- Calvin Chan
We gratefully acknowledge support from:

- Direct Grant 2004-05 (#2010255) from the Chinese University of Hong Kong
- Competitive Earmarked Research Grant 2005-07 (#2110122) from the Research Grants Council of Hong Kong
Overview

- Research objective
  - Does inherent aspect matter?
- Definition of aspectual asymmetry
  - Inherent lexical aspect vs. grammatical aspect
  - The notion of ‘perfective advantage’
- Previous studies
- Present study
  - Cantonese study
- Methodology
- Results and analyses
- Conclusion
Introduction

- **Perfective sentence**
  - e.g. *they walked to school*

- **Imperfective sentence**
  - e.g. *they were walking to school*
Objectives

- To investigate if the perfective advantage is observed in Cantonese
- To examine potential aspectual asymmetry across different verb classes (Activity, Accomplishment, Achievement)
Previous reaction time studies

- **English**
  - Magliano & Schleich (2000)

- **Cantonese, Mandarin**
  - Chan et al. (2004)
  - Yap et al. (2004)

- **Japanese**
  - Yap et al. (2004)
Our mental representation of events

- time
- space
- protagonist
- causation
- intentionality

Magliano & Schleich (2000)

Different aspectual markers impose different interpretations on the temporal duration of activities.
**Temporal information ... & event representation**


  - *Are perfective constructions processed faster than imperfective ones?*

  - *Focus: accomplishment verbs*
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.

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

They walked to school.

Walk-ed

T₁  T₂  T₃

Often perceived as completed.
The subject was shown a sentence ...

- Either
  - The boy was drawing a picture.

- Or
  - The boy drew a picture.
The subject was then shown two pictures ... *ongoing* vs. *completed*

Imperfective 56%  
Perfective 76%
## Aspectual asymmetries (processing speed) across different languages

<table>
<thead>
<tr>
<th>Language</th>
<th>Perfective</th>
<th>Imperfective</th>
<th>Speed Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>NA</td>
<td>1397 ms</td>
<td>perfective</td>
</tr>
<tr>
<td>Mandarin</td>
<td>1315 ms</td>
<td>1253 ms</td>
<td>perfective</td>
</tr>
<tr>
<td>Cantonese</td>
<td>1118 ms</td>
<td>1524 ms</td>
<td>perfective</td>
</tr>
<tr>
<td>Japanese</td>
<td>1512 ms (-ta)</td>
<td>1724 ms (-teiru tokoro)</td>
<td>perfective</td>
</tr>
</tbody>
</table>

- **Speed Advantage**: The perfective aspect has an advantage over the imperfective aspect.
## Aspectual asymmetries (accuracy percentages) across different languages

<table>
<thead>
<tr>
<th></th>
<th>English</th>
<th>Mandarin</th>
<th>Cantonese</th>
<th>Japanese</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perfective</strong></td>
<td>76%</td>
<td>87%</td>
<td>95%</td>
<td>96% (-ta)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>96% (-ta tokoro)</td>
</tr>
<tr>
<td><strong>Imperfective</strong></td>
<td>56%</td>
<td>82%</td>
<td>91%</td>
<td>95% (-teiru tokoro)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>91% (-teiru)</td>
</tr>
<tr>
<td><strong>Over all accuracy</strong></td>
<td>66%</td>
<td>85%</td>
<td>93%</td>
<td>95%</td>
</tr>
</tbody>
</table>
Current study

Cantonese

- Use of auditory stimuli.
- Focus not only on accomplishment verbs, but also activity and achievement verbs.
- More aspectual markers are introduced.
Current study
Cantonese

Aspect

Inherent lexical
(situational aspect)

Grammatical
(viewpoint aspect)

state
activity
accomplishment

achievement

Perfective
zo2
jyun4

Imperfective
... gan2
hai2dou6
...
Inherent Lexical Aspect

- **Accomplishment**: [+telic], [+durative]
  - E.g. sik6 go3 ping4gwo2
    eat CL apple
    ‘to eat an apple’

- **Activity**: [-telic], [+durative]
  - E.g. jau4seoi2
    swim
    ‘to swim’

- **Achievement**: [+telic], [-durative]
  - E.g. lo2 zoeng2
    receive award
    ‘to receive an award’
Grammatical Aspect

- **Imperfective markers**
  - depict an ongoing action
  - e.g. sik6 gan2 go3 ping4gwo2
eat IMPFV CL apple
hai2dou6 sik6 go3 ping4gwo2
IMPFV eat CL apple
‘eating an apple’

- **Perfective Markers**
  - depict a completed action
  - e.g. lo2 zo2 zoeng2
receive PFV award
lo2 jyun4 zoeng2
receive PFV award
‘to receive an award’
Presentation of either a **perfective** or **imperfective** utterance

go3 laam4zai2 waak6 gan2 do2 faa1

‘The boy is drawing a flower.’
A pair of pictures depicting ongoing vs. completed events
Reaction Time Study
## Experimental setup for the Cantonese study

<table>
<thead>
<tr>
<th>Experiment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verb Classes</td>
<td>ACC</td>
<td>ACC</td>
<td>ACT</td>
<td>ACT</td>
<td>ACT ACC ACH</td>
</tr>
<tr>
<td>Aspect Markers</td>
<td>gan2 zo2</td>
<td>hai2dou6 jyun4</td>
<td>gan2 zo2</td>
<td>hai2dou6 jyun4</td>
<td>gan2 zo2</td>
</tr>
<tr>
<td>No. of Subjects</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>36</td>
</tr>
</tbody>
</table>
Experimental Design

Experiment 1  Accomplishment verbs

Imperfective marker gan2

Perfective marker zo2

Experiment 2  Accomplishment verbs

Imperfective marker hai2dou6

Perfective marker jyun4
Experimental Design

Experiment 3
Imperfective marker: gan2
Perfective marker: zo2

Experiment 4
Imperfective marker: hai2dou6
Perfective marker: jyun4
Experimental Design

Activity verbs

Imperfective marker: gan2

Perfective marker: zo2

Accomplishment verbs

Imperfective marker: gan2

Perfective marker: zo2

Achievement verbs

Imperfective marker: gan2

Perfective marker: zo2

Experiment 5
### Cantonese study - reaction time

<table>
<thead>
<tr>
<th></th>
<th>Experiment 1</th>
<th>Experiment 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Verb Classes</strong></td>
<td>Accomplishment</td>
<td>Accomplishment</td>
</tr>
<tr>
<td><strong>Aspect Markers</strong></td>
<td>gan2 / zo2</td>
<td>Hai2dou6 / jyun4</td>
</tr>
<tr>
<td><strong>Perfective</strong></td>
<td>Mean=947ms, SD=247ms</td>
<td>Mean=977ms, SD=298ms</td>
</tr>
<tr>
<td><strong>Imperfective</strong></td>
<td>Mean=1032ms, SD=289ms</td>
<td>Mean=1113ms, SD=396ms</td>
</tr>
<tr>
<td><strong>Significance</strong></td>
<td>P&lt;0.0074</td>
<td>P&lt;0.000</td>
</tr>
<tr>
<td><strong>Perfective advantage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Korean study - reaction time

<table>
<thead>
<tr>
<th></th>
<th>Experiment 1</th>
<th>Experiment 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Verb Classes</strong></td>
<td>Activity</td>
<td>Accomplishment</td>
</tr>
<tr>
<td><strong>Aspect Markers</strong></td>
<td>-ko issta / -essta</td>
<td>-ko issta / -essta</td>
</tr>
<tr>
<td><strong>Perfective</strong></td>
<td>Mean=1101ms SD=469ms</td>
<td>Mean=1226ms SD=427ms</td>
</tr>
<tr>
<td><strong>Imperfective</strong></td>
<td>Mean=1010ms SD=465ms</td>
<td>Mean=913ms SD=338ms</td>
</tr>
<tr>
<td><strong>Baseline</strong></td>
<td>Mean=1089ms SD=492ms</td>
<td>Mean=997ms SD=491ms</td>
</tr>
<tr>
<td>Verb Classes</td>
<td>Activity</td>
<td>Activity</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Aspect Markers</td>
<td>gan2 / zo2</td>
<td>hai2dou6/ jyun4</td>
</tr>
<tr>
<td>Perfective</td>
<td>Mean=1211ms</td>
<td>Mean=1172ms</td>
</tr>
<tr>
<td></td>
<td>SD=379ms</td>
<td>SD=431ms</td>
</tr>
<tr>
<td>Imperfective</td>
<td>Mean=1122ms</td>
<td>Mean=1062ms</td>
</tr>
<tr>
<td></td>
<td>SD=366ms</td>
<td>SD=419ms</td>
</tr>
<tr>
<td>Significance</td>
<td>p &lt;0.028</td>
<td>p &lt;0.015</td>
</tr>
<tr>
<td></td>
<td>No Perfective advantage</td>
<td>No Perfective advantage</td>
</tr>
</tbody>
</table>
## Experiment 3

<table>
<thead>
<tr>
<th>Verb Classes</th>
<th>Activity</th>
<th>Accomplishment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perfective</strong></td>
<td>Mean=1141ms SD=416ms</td>
<td>Mean=1210ms SD=425ms</td>
</tr>
<tr>
<td><strong>Imperfective</strong></td>
<td>Mean=1040ms SD=392ms</td>
<td>Mean=993ms SD=399ms</td>
</tr>
<tr>
<td><strong>Baseline</strong></td>
<td>Mean=1011ms SD=428ms</td>
<td>Mean=902ms SD=355ms</td>
</tr>
</tbody>
</table>

**Significance**
## Cantonese Study - reaction time

### Experiment 5

<table>
<thead>
<tr>
<th>Activity</th>
<th>Accomplishment</th>
<th>Achievement</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perfective <strong>zo2</strong></td>
<td>1402 ms</td>
<td>1178 ms</td>
<td>1382 ms</td>
</tr>
<tr>
<td>Imperfective <strong>gan2</strong></td>
<td>1279 ms</td>
<td>1237 ms</td>
<td>1250 ms</td>
</tr>
</tbody>
</table>

### Mean reaction time

- Mean reaction time of Imperfective vs. perfective, p<.0169
- Mean reaction time across verb types, p<.000
- Act. vs Acc. p<.000; Acc. vs Ach. p<.003
## Aspectual Asymmetries across languages

<table>
<thead>
<tr>
<th>Experiment</th>
<th>English</th>
<th>Cantonese</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Verb Classes</td>
<td>Aspect Markers</td>
</tr>
<tr>
<td>1</td>
<td>ACC</td>
<td>gan2 zo2</td>
</tr>
<tr>
<td>2</td>
<td>ACC</td>
<td>hai2dou6 jyun4</td>
</tr>
<tr>
<td>3</td>
<td>ACT</td>
<td>gan2 zo2</td>
</tr>
<tr>
<td>4</td>
<td>ACT</td>
<td>hai2dou6 jyun4</td>
</tr>
<tr>
<td>5</td>
<td>ACT</td>
<td>gan2 zo2</td>
</tr>
</tbody>
</table>
The Cantonese data confirm the aspectual asymmetry in language processing.
- ACT: no perfective advantage
- ACC: perfective advantage

The asymmetry is even clearer in Cantonese, due to the ‘tenseless’ feature of this language.

The asymmetry is observed in both processing accuracy and response speed.
Further studies

- To obtain a clearer picture of the effect of verb class on reaction time
  - Accomplishment, Activity and Achievement
Thank you!

Q & A

Session
Summary of differences

- **Madden & Zwaan (2003)**
  - Readers were sensitive **only to perfective cues**.
    - **Perfective:** 76% (SD 21%)
    - **Imperfective:** 56% (SD 28%)
    - **Overall:** 66%

- **Our Chinese studies**
  - Readers were sensitive to both perfective and imperfective cues.
    - **Mandarin**
      - 87% (SD 12%)
      - 82% (SD 10%)
      - 85%
    - **Cantonese**
      - 95% (SD 4%)
      - 91% (SD 8%)
      - 93%

