

Discourse-based Learner Error Detection

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どんな研究？

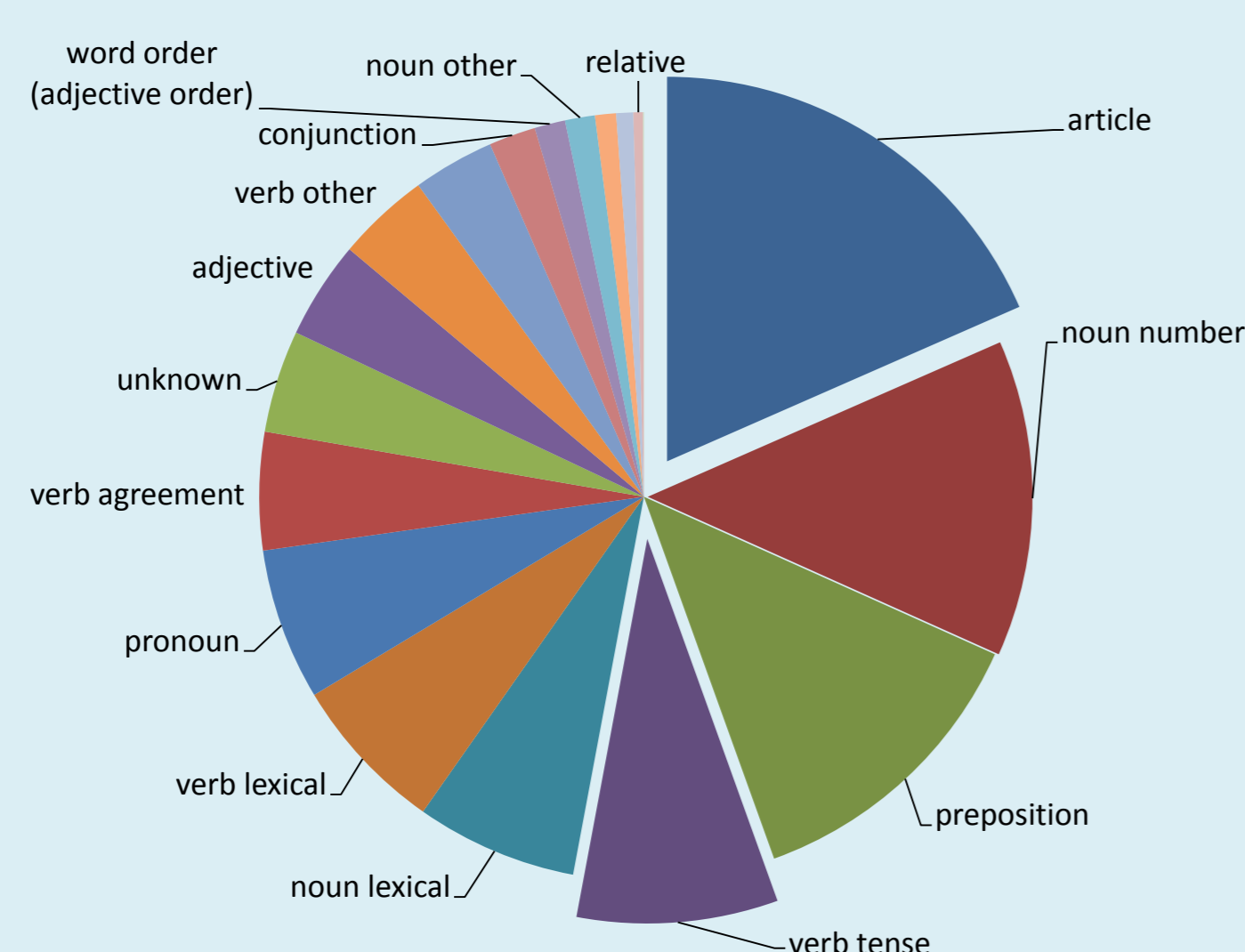
- Error Detection and Correction Workshop 2012
- EDCW shared task:
 - Verb track (Subject-verb agreement errors)
 - Preposition track
 - Open track (all types of errors)
- Participation in EDCW shared task

何が分かる？

- Need of tools for the detection and correction of grammatical errors.
- Existing technology is not perfect.
 - Article errors, verb-tense errors, ... require discourse information.
- Discourse information was used to correct verb-tense errors.
- Temporal reasoning is necessary.

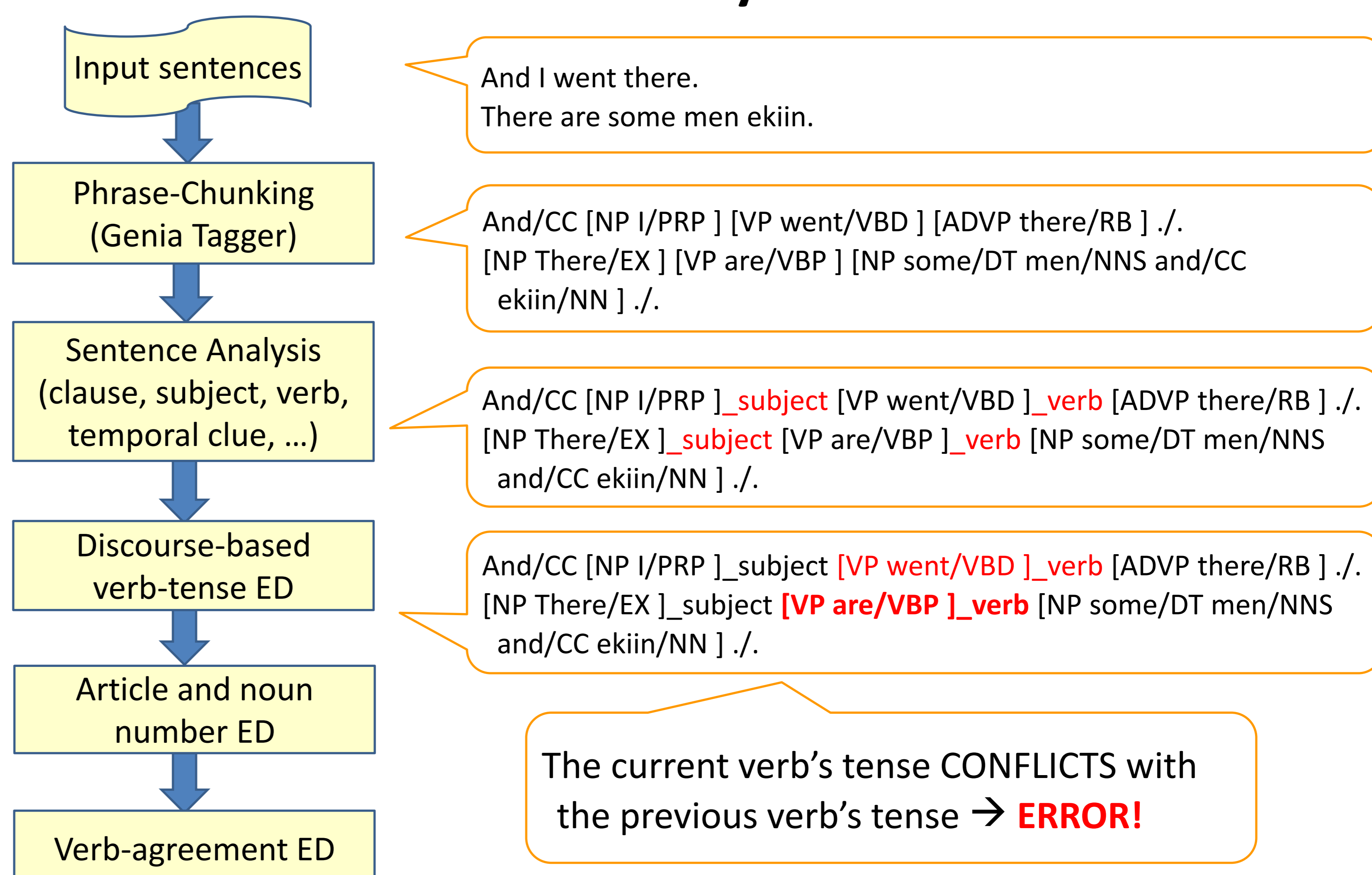
Methods

Konan-Jiem learner corpus



My hobby is playing basketball, watching baseball and walking to eat.
I have played basketball since ten years ago.
But I **<v_tns crr="have not played">**don't play**</v_tns>** basketball recently.
I want to play basket ball but I'm busy.
I like **<at crr="the">**HANSHIN Tigers very much.
So I often watch **<at crr="">**the**</at>** baseball **<n_num crr="games">**game**</n_num>**.
I went to watch **<at crr="the">**Tigers **<prp crr="on">**at**</prp>** October 20.
I enjoyed it very much.
I want to watch **<pn crr="them">**next year.
I like **<at crr="" ch="2">**a**</at>** **<n_num crr="sweets">**sweat**</n_num>**.
I often go to eat **<at crr="">**a**</at>** desert after school.

Error Detection System



Discourse-based Verb-tense Error Detection

Verb form – Tense Mapping

do|do n't ... VB → SIMPLE_PRESENT
is|am|are ... VBG → PRESENT_PROGRESSIVE
will|shall ... VBZ|VBP → SIMPLE_FUTURE
has|have ... VBN → PRESENT_PERFECT
VBD → SIMPLE_PAST

Temporal Clue – Tense Mapping

sometimes → SIMPLE_PRESENT
currently → PRESENT_PROGRESSIVE
soon → SIMPLE_FUTURE
recently → PRESENT_PERFECT
yesterday → SIMPLE_PAST

- ❖ Verb tense is dependent on the tentative temporal semantics of an event.
- ❖ Temporal clues constrain the verb tense.
- ❖ Verb tense of a clause is preserved if there is no temporal clue.
- ❖ If a clause contains a verb tense error, it is not used for error detection of the following clause.

Results and Analysis

VERB-TENSE ONLY

F = 0.117 P = 0.088 R = 0.173

OPEN TRACK – DRY RUN

F = 0.230 P = 0.310 R = 0.183

OPEN TRACK – FORMAL RUN

F = 0.122 P = 0.192 R = 0.089

- ❖ A temporal clue can go with many tenses.
- ❖ Writers do not use adverb clues.
- ❖ Writers mix facts, past events and present events in a discourse.
→ Discourse-continue assumption is broken.
- Inference is required to understand writers' intention.

For ten years: present perfect or past perfect?

I **had practiced** for ten years.

→ Did he stop practice?

I was very happy in this summer vacation.

Because I like to travel, **<con crr="">**so**</con>** I traveled to a lot of places.

I **went** to Okayama, Hiroshima, Shiga, Ehime and Tokyo.

My friends **live** **<prp crr="in">**these places.

I played with my friends.

Tokyo is very noisy, but very interesting.

→ This summer vacation: He is telling about recent ly past events. He went to O, H, S, E and T **to visit his friends**, so his friends must be living there at present. → Present(live)