

Comparability of Frames in Bilingual Children's Books

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Issues in Multilingual Frame Semantics



Outline

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Overview

- Ongoing research project on comparison of lexical items and semantic frames in Japanese and English bilingual children's books
 1. Quantitative
 - Evaluation of **Lexical Unit (LU) Coverage** and **Frame Coverage** of **Japanese FrameNet (JFN)**, in comparison to those of **FrameNet (FN)**
 - Ohara and Okubo 2018
 2. Qualitative
 - Comparison of Japanese original sentences with their English translation
 - Frames-and-Constructions Analysis: Examination of interaction between frames, lexicon, and grammatical constructions

Why Study Bilingual Children's Books?

- Since readers of children's books are in the process of acquiring their first languages, lexical items and grammatical constructions appearing in such books and semantic frames evoked by them can be regarded as those acquired relatively early by children **and thus cognitively basic**
 - For quantitative research: to evaluate LU Coverage and Frame Coverage of FNs & Constructicons
 - For qualitative research: to compare how cognitively basic meanings are encoded in each language

Text analyzed

Takashi Yanase (1991). *Anpanman 1*. Translated by Yuriko Tamaki. Tokyo: Froebel Kan.

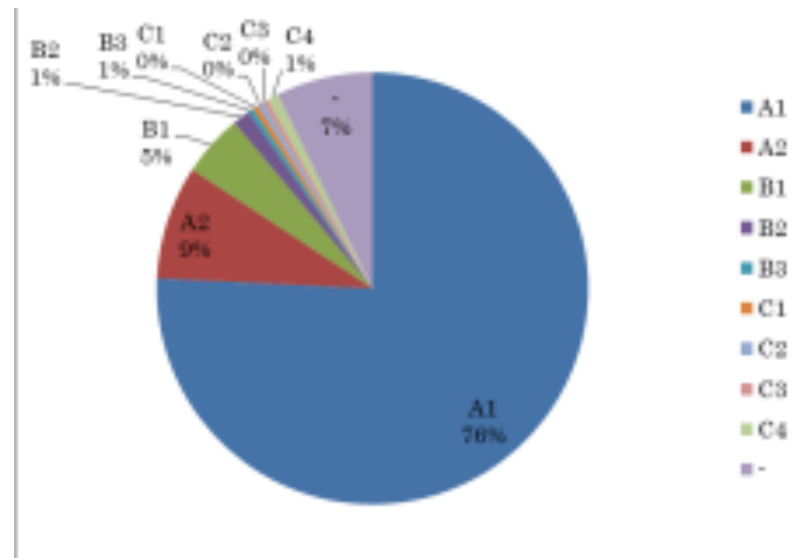
of episodes: 23

of sentences: 652

of words in Japanese original: 2998

of words/sentence: approx. 5

85% of the words used: learned by Age 9



Study #1: Quantitative Study

- Evaluation of **LU Coverage** and **Frame Coverage** of **JFN**, in comparison to those of **FN**
 - Ohara and Okubo 2018
- Methods
 1. Annotate all content words with frame names
 2. Calculate **LU Coverage** & **Frame Coverage** for Verbs, Adjectives, and Adjectival Nouns

Study #1: Results

	# Types already defined on JFN	# Types not yet defined on JFN	LU Coverage %	Frame Coverage %
Adjectival Noun	3	7	23.1	76.9
Adjective	15	19	40.5	91.9
Verb	55	60	41	85.8
Noun>AN	4	9	26.7	86.7
Noun>V	11	14	36.7	83.3
Noun>V/AN	1	2	33.3	100
Total	89	111	38.4	86.2

Frame Coverage:

Improved since Ohara (2011) (82%)

LU Coverage:

Very low

Adjectival Nouns (e.g. *daijoubu* “okay”, *toomei* ‘transparency’):
both Frame Coverage & LU Coverage are low

Study #1: Comparison with FN

- Comparing words in Japanese original and English translation
 - 3 episodes (79 sentences in Japanese original)
 - Comparison of # of Tokens; all POS
- **LU coverage**
 - **FN 88.5%**
 - **JFN 44.8%**

	#Tokens in English translation	Coverage on FN %	#Tokens in Japanese original	Coverage on JFN %
LU Coverage %	115	88.5	56	44.8
Frame Coverage %	121	93.1	123	98.4

Study #1: Summary

- Since JFN's Frame Coverage is high, it seems possible to improve its LU Coverage by adding the undefined basic words found in the children's book
- Expanding the size of example sentences by crowdsourcing
 - Ohara et al. 2018

Study #2: Qualitative Study

- Comparison of Japanese original sentences with their English translation
- **Methods**
 1. **Focus on** `Experiencer_focused_emotion`, `Emotion_directed`, `Perception_experience` **frames**
 2. **Examine the corresponding sentence in the other language and see whether there is a frame match**
 3. **Annotate pairs of sentences exhibiting frame mismatch**
 4. **Analyze how they reach the “same” interpretation**

Study #2: Frame Mismatch 1)

- I) J: `Experiencer_focused_emotion` frame
[The words in this frame describe an **Experiencer**'s emotions with respect to some **Content**]

BIKKURI-SI -ta wa

surprise -do -PAST SFP

Literal Transl. '(I) underwent a surprise'

Experiencer, **Content**: DNI

- E: `Stimulate_emotion` frame

[Some phenomenon (the **Stimulus**) provokes a particular emotion in an **Experiencer**]

Golly, **you** STARTLED **me**

Frame-to-Frame relations can't account for the Frame Mismatch

- I) J: `Experiencer_focused_emotion` frame
[The words in this frame describe an **Experiencer**'s emotions
with respect to some **Content**]
Perspective on: `Emotions` frame
BIKKURI-SI -ta wa
surprise -do -PAST SFP
Literal Transl. '(I) underwent a surprise'
- E: `Stimulate_emotion` frame
[Some phenomenon (the **Stimulus**) provokes a particular
emotion in an **Experiencer**]
Uses: `Emotions` frame
Golly, you STARTLED me
-
- ```
graph TD; F1[Experiencer_focused_emotion frame] -.-> F2[Stimulate_emotion frame]; F1 -.-> F2; F1 -.-> F2;
```

# Rhetorical & Constructional Factors for the Frame Mismatch

- English uses transitive constructions with significantly greater frequency than Japanese
  - Seidensticker & Anzai 1983
  - Hasegawa et al. 2014: 174
  - Ohara 2002

## Study #2: Frame Mismatch 2)

### 2) J: Perception\_experience frame

[Contains perception words whose **Perceiver\_passive** have perceptual experiences that they do not necessarily intend to.]

*nakigoe wa*<sub>PHENOMENON</sub> *tani -soko kara KIKOERU*

cry TOP valley-bottom ABL can.be.heard

Literal Transl. 'A cry can be heard from the bottom of the valley'

**Perceiver\_passive**, **Body\_part**: DNI

### →E: Arriving frame

[An object **Theme** moves in the direction of **Goal**]

**It's COMING** from the bottom of the valley<sub>SOURCE</sub>

**Goal**: DNI

# Frame-to-Frame relations can't account for the Frame Mismatch

## 2) J: Perception\_experience frame

[Contains perception words whose **Perceiver\_passive** have perceptual experiences that they do not necessarily intend to.]

Inherits from: Perception frame

*nakigoe wa* PHENOMENON *tani -soko kara KIKOERU*

cry TOP valley-bottom ABL can.be.heard

Literal Transl. 'A cry can be heard from the bottom of the valley'

## → E: Arriving frame

[An object **Theme** moves in the direction of **Goal**]

Inherits from: Eventive\_affecting frame (An Entity undergoes some Change)

**It's COMING** from the bottom of the valley SOURCE

# Rhetorical & Constructional Factors for the Frame Mismatch

- Unagentive subjects are often used in English
- 3) J: koohii o ippai nom.eba, yoku naru desyoo  
coffee ACC one-cup drink.COND well become AUX  
Lit. 'If (you) drink a cup of coffee, (you) will feel better'
- E: A cup of coffee will make you feel better

cf. Czulo 2013



# Summary

- Comparison of lexical items and semantic frames in Japanese and English bilingual children's books:
  1. Provides a testing ground for quantitative evaluation of LU Coverage and Frame Coverage, since they consist of cognitively basic words and meanings;
  2. Is good for qualitative examination of Frame Mismatches/ Divergences, since they consist of relatively short sentences, simple constructions, and often do not involve frame integration ("frame groups")
    - Frame-to-Frame relations are often not able to account for Frame Mismatches;
    - In addition to cultural, typological, and constructional factors, **rhetorical** factors also seem relevant
    - Implications for contrastive/multilingual construction building

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# Study #1: # of Words Analyzed

|                | # Tokens | # Types |
|----------------|----------|---------|
| Adverbial Noun | 27       | 13      |
| Adjective      | 111      | 37      |
| Verb           | 456      | 134     |
| Noun > AN      | 28       | 15      |
| Noun > V       | 48       | 30      |
| Noun > V/AN    | 6        | 3       |
| Total          | 676      | 232     |