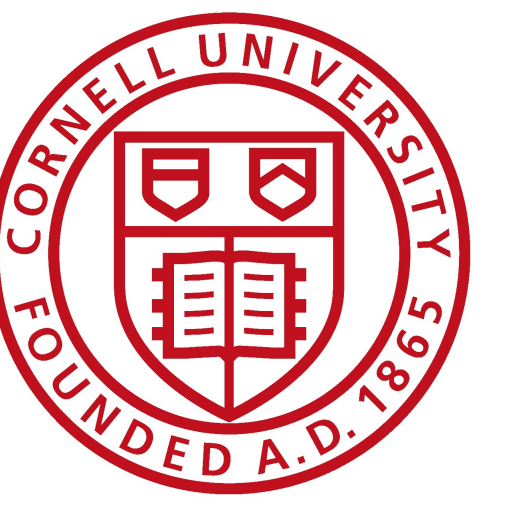# Rethinking the Core-Periphery Model: Evidence from Japanese

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The *Core-Periphery* Model

- According to Itô & Mester (1993), Japanese can be divided into four distict strata.
- Each stratum is characterized by surface adherence to a different number of the stratum-defining constraints listed below:

(1)
   a. **SyllStruc**: Prevents complex onsets and codas
   b. **NoVoicedGem (No-DD)**: No voiced obstruent geminates
   c. **NoVoicelessLab (No-P)**: Prevents nongeminate/singleton [p]
   d. **NoNas Voiceless (No-NT)**: Postnasal obstruents must be voiced

- The hierarchical behavior of the four strata is shown below, from I&M (2004: 557).

(2)

	SYLLSTRUC	No-DD	No-P	No-NT
Yamato	✓	✓	✓	✓
Sino-Japanese	✓	✓	✓	violated
Assimilated Foreign	✓	✓	violated	violated
Unassimilated Foreign	✓	violated	violated	violated

Origin and Behavior of Lexical Strata

- Lexical items borrowed during the same era of a language's history show similar phonological and phonotactic behavior.
- Kiparsky (1973) noted that these changes are gradual and hierarchical, with older strata showing heavier phonotactic restrictions.

Same Underlying Form; Different Surface Form

- I&M posit multiple synchronic strata with the same markedness constraint ranking
  - Each stratum is defined by a separate ranking of FAITH.
- Below, two separate lexical items with identical underlying forms, /pan/, result in two different surface forms since they belong to different strata.

(3)

/pan/	No-DD	FAITH/ Assimilated	No-P	FAITH/ Sino-Japanese	No-NT
'bread' ☞[pan]			*		
Assimilated Foreign [han]		*!			
'group' [pan]			*!		
Sino-Japanese ☞[han]				*	

- Assimilated foreign loan stratum: FAITH ≫ No-P ⇒ surface form [pan].
- Sino-Japanese loan stratum: No-P ≫ FAITH ⇒ surface form [han].

Exceptions to the *CP* Model

I. Exceptions to No-NT

- Yamato words like *intiki* 'trickery' and *anta* 'you' violate NO-NT outright.
  - *Anta* derives from *anata* via syncope, and has **moved from the core toward the periphery**.
- I&M call exceptions like these "undoubtedly native, but peripheral", but provide no explanation for their behavior.

II. Exceptions to No-P

- The classifier *pun* 'minute' combines with numbers to count time.
- As a member of the Sino-Japanese stratum, it should obey the NO-P constraint.
- Recently, however, we have seen the paradigm level in fluent speech, **moving toward the periphery of the lexicon**.

(4)

Expected Compound Pronunciation	**New Compound Pronunciation**	Number Morpheme	Counter Morpheme	Meaning
ip-pun	**ip-pun**	ichi 'one'	pun	'one minute'
ni-ɸun	**ni-pun**	ni 'two'	pun	'two minutes'
san-bun	**san-pun**	san 'three'	pun	'three minutes'

III. Exceptions to No-DD

- Expected adaptation mechanisms of voiced obstruent-final English borrowings:
  - Assimilated Stratum → geminate voiceless obstruent.
  - Unassimilated Stratum → geminate voiced obstruent.
- However, there are in fact *five* different adaptation mechanisms for English borrowings with a final voiced consonant.
  - Voiced geminate, voiceless geminate, voiced singleton, voiceless singleton, lengthened vowel before voiced singleton.
- According to Crawford (2009), **voiced geminate borrowings are the most popular adaptation mechanism in the oldest attestations.**

What the Exceptions Tell Us

- The *Core-Periphery* model fails when grammatical processes affect individual lexical items, through phonological processes or lexical processes (analogy).

Conclusions

- Alternations accounted for by the *Core-Periphery* model are the lexical residue of earlier constraint rankings.
- Allowing underlying forms of lexical items to update in response to sound change eliminates the need for multiple synchronic constraint rankings.

My Proposal

- I argue for a more traditional view of OT:
  - Only one constraint ranking, accounting for all synchronic behavior of these strata.
- I&M's multiple FAITH rerankings reflect the constraint rankings present at different stages throughout the history of a language.
- The hierarchical nature of the strata comes from the gradual nature of the constraint rerankings that result in sound change.
- Once a given constraint reranking has occurred, younger generations of speakers can no longer generate these forms on-line using productive phonology.
  - They must separately store each alternation previously generated by the old constraint ranking in the lexicon.
- This **lexical updating** process effectively moves the alternation from the synchronic phonology to the mental lexicon.
- These new forms are free to be modified by later grammatical processes without violating highly-ranked synchronic constraints.

Why the Lexicon?

- We not only allow for, but **motivate** the analogy seen in *pun*.
- Kiparsky (2012) states, "analogical change is grammar optimization, the elimination of unmotivated grammatical complexity or idiosyncrasy" (p. 21)
- **The h/p alternation is not motivated by synchronic phonology.**

Different Underlying Form; Different Surface Form

- Derivations to account for stratal data like (3) above become trivial.
- Though originally /pan/, the underlying form for *han* 'group' became stored as such once the reranking occurred that later allowed *pan* 'bread' to be borrowed as-is.
- By the time they coexisted, they had different underlying forms.

(5)

	SYLLSTRUC	FAITH	No-P
/pan/ 'bread' ☞[pan]			*
Assimilated Foreign [han]		*!	
/han/ 'group' [pan]		*!	
Sino-Japanese ☞[han]			*

Selected References

Crawford, Clifford James. 2009. *Adaptation and transmission in Japanese loanword phonology.* Ph.D. thesis, Cornell University.

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