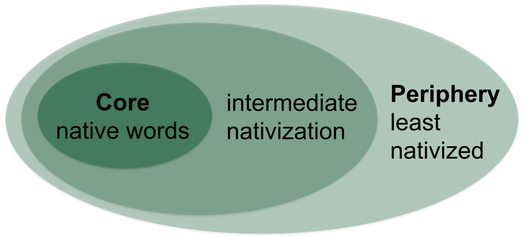
# A scalar constraint approach to the typology of loanword adaptation

**Brian Hsu & Karen Jesney**
George Mason University  University of Southern California

## 1. Patterns of loanword adaptation

Phonological systems often impose different restrictions on native vs. non-native words.




**A. Superset-at-periphery:** Less nativized loanwords allow a ***greater range*** of marked structures than native words. (Paradis & Lebel 1994, Itô & Mester 1995)

**B. Subset-at-periphery:** Less nativized loanwords allow a ***smaller range*** of marked structures than native words. (Kenstowicz 1995)

**C. Divergent repairs:** Loanword classes ***differ in the repairs*** used to avoid marked structures. (Kang 1996, Peperkamp et al. 2008)

**All of these patterns are *implicational***

- If a process applies at some stratum *s* of nativization, but fails to apply at stratum *s* + 1, it fails to apply at all strata beyond *s* + 1.

**Claim: Harmonic Grammar with scalar constraints can capture all of these patterns of adaptation.**

## 2. Scalar constraints

In Harmonic Grammar (Legendre et al. 1990, Smolensky & Legendre 2006) constraints are ***weighted***.

- **Proposal:** A scaling factor ***s*** is added to the basic constraint weight ***w***. The value of ***s*** increases with distance from the core.
- Distance from the core is continuous, with the core assigned a distance value ***d*** of 0.
- The penalty assigned by a constraint C = ***w* + *s*(*d*)**

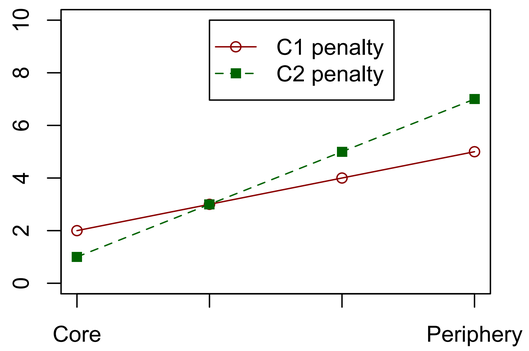
**Example:**

C1 weight = 2
C1 scaling factor = 1

C2 weight = 1
C2 scaling factor = 2

At the **core**:
C1 penalty = 2 + 1(0) = 2
C2 penalty = 1 + 2(0) = 1

At distance ***d* = 3**:
C1 penalty = 2 + 1(3) = 5
C2 penalty = 1 + 2(3) = 7



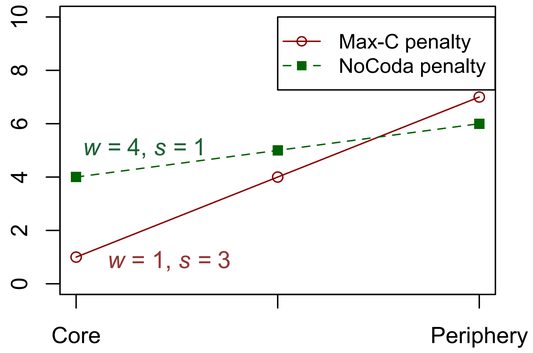

## 3. Analysis of stratum sensitivity in Harmonic Grammar with scalar constraints

### A. Superset-at-periphery

**Guaraní:** Nativized Spanish loanwords undergo coda deletion; recent borrowings permit codas. (Pinta 2013)

- Less nativized loanwords allow codas, but native words do not.

| | | |
|---|---|---|
| /kárlos/ → [ka.ló] | 'Carlos' | MAX-C violated |
| /lúnes/ → [lú.ne] | 'Monday' | MAX-C violated |
| /ensaláða/ → [en.sa.lá.ða] | 'salad' | NOCODA violated |




**Weighting conditions for analysis of superset-at-periphery patterns:**

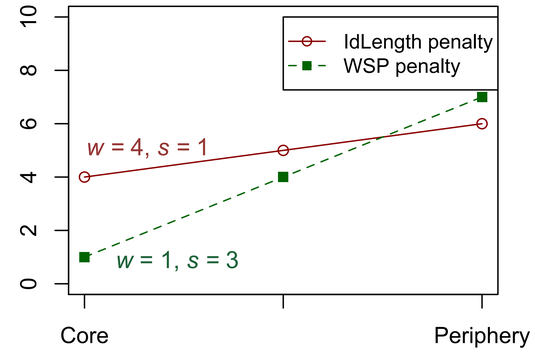
*w*(M) > *w*(F), but F has a larger scaling factor, so the faithfulness penalty exceeds the markedness penalty beyond some distance from the core *d*.

### B. Subset-at-periphery

**Hungarian:** Nativized loanwords show contrastive gemination; recent loanwords require gemination following short stressed vowels. (Nádasdy 1989 Magyar 2014)

- Less nativized loanwords do not have fully-contrastive geminates, but native words do.

| | | |
|---|---|---|
| /lɔp/ → [lɔp] | 'piece of paper' | WSP violated |
| /klip/ → [klipː] | 'video clip' | IDENTLENGTH violated |




**Weighting conditions for analysis of subset-at-periphery patterns:**

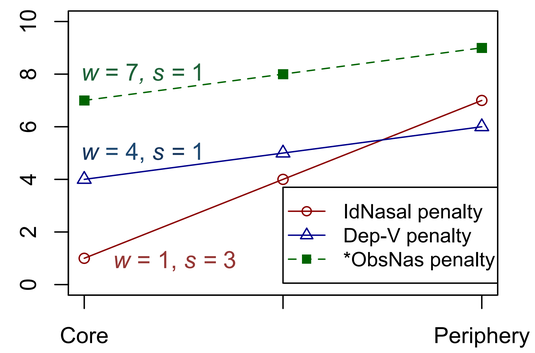
*w*(F) > *w*(M), but M has a larger scaling factor, so the markedness penalty exceeds the faithfulness penalty beyond some distance from the core *d*.

### C. Divergent repairs

**Korean:** Obstruent + nasal sequences are repaired by obstruent nasalization in native and Sino-Korean words, and by vowel epenthesis in recent borrowings. (Kang 1996)

- Some loanword classes use nasalization repairs, while others use epenthesis

| | | |
|---|---|---|
| /kuk-mul/ → [kuŋmul] | 'soup' | IDENTNASAL violated |
| /kuk-min/ → [kuŋmin] | 'people' | IDENTNASAL violated |
| /pʰɪknɪk/ → [pʰikinik] | 'picnic' | DEP-V violated |




**Weighting conditions for analysis of divergent repair patterns:**

*w*(F1) > *w*(F2), but F2 has a larger scaling factor, so the relative faithfulness penalties are reversed beyond some distance from the core *d*.

## 4. Discussion

In HG, each pattern of adaptation is predicted if violations are scaled based on distance from the core.

- Patterns arise through conflict between constraints that favor vs. disfavor repair, or constraints that favor different repairs.
- These patterns are always ***implicational***.

  …Relative penalties assigned by pairs of conflicting constraints can be inverted ***only once*** between the core and the periphery.

Approaches in OT with ranked constraints (Prince & Smolensky 1993) ***overgenerate***.

Ex.: Unattested, non-implicational Korean' pattern where repair choice 'skips' a level.

| | | |
|---|---|---|
| Native | /kuk-mul/ → [kummul] 'soup' | *nasalization* |
| Sino-Kor. | /kuk-min/ → [kukimin] 'people' | *epenthesis* |
| Foreign | /pʰɪknɪk/ → [pʰinnik] 'picnic' | *nasalization* |

This pattern is predicted by indexed constraint ranking:

$*\text{OBSNAS} >> \text{DEP}_{F} >> \text{IDNASAL}_{F} >> \text{IDNASAL}_{S\text{-}K} >> \text{DEP}_{S\text{-}K} >> \text{DEP}_{N} >> \text{IDNASAL}_{N}$

- Indexed constraint approaches require metaconditions to prevent arbitrary constraint rerankings across strata. (Itô & Mester 1995, 1999, 2001)
- Learners must posit a potentially unbounded number of indexed constraint strata. (Hsu & Jesney to appear)
- These problems are obviated in HG with weighted scalar constraints.

**See handout for references**

bhsu2@gmu.edu  jesney@usc.edu