From variation to the emergence of linguistic regularities

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**Introduction:**
- In languages, two rules may be in competition. Regularization occurs when one of them emerges as an optimal solution and completely overrides the other one.
- Regularization is often seen as a change in individuals’ grammar.
- Evidences from cultural evolution (Derex, 2015, 2016) or complex systems (Becker & al., 2009) studies suggests that changes at a macro level doesn't necessarily reflect changes at a micro level.
- In linguistic terms, this suggests that regularization at a community-level does not reflect a change in individuals’ grammar.
- In this study, I explore how community-level factors may explain the regularization of certain derivational processes (Compound Abbreviated Loanwords) in Japanese.

**What is a Compound Abbreviated Loanword (CAL)?**
CALs are abbreviations:
- Based on two constituents of foreign origin
- Frequent and employed in various situations (not only in informal speech)
- Phonologically constrained derivation process: Conservation of the 2 initial morae of each constituent to form a four morae abbreviation (see `pokemon` below).
- Sometimes irregular: Majority of exceptions include three morae, maintaining only the first mora of the second constituent (see `potetā`).
- Individuals show different patterns of irregularity, reflecting competition between rules.

**Examples**

<table>
<thead>
<tr>
<th>English</th>
<th>Japanese</th>
<th>Katakana</th>
</tr>
</thead>
<tbody>
<tr>
<td>pocket monster</td>
<td>po.ke.tō mo. N</td>
<td>ポケットモン</td>
</tr>
<tr>
<td>potato chips</td>
<td>po.te.tā Qpu.su.</td>
<td>ポテチ</td>
</tr>
</tbody>
</table>

**Community vs. individual-level regularization:**
- Corpus surveys of attested forms (Labrune, 2007; Lamarque, 2015) show that three morae CALs are often created when the second mora of the second constituent is either the lengthening of a vowel (/R/) or the first part of a geminate consonant (/Q/), as in `potetā`. Moreover, the deletion of these morae has become more systematic with time:

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>% deletion of /R/</td>
<td>45%</td>
<td>81%</td>
</tr>
<tr>
<td>% deletion of /Q/</td>
<td>45%</td>
<td>86%</td>
</tr>
</tbody>
</table>

- This suggests that the deletion of /R/ and /Q/ when they appear in final position of a CAL has regularized.
- However, an experimental study (Lamarque, 2016) showed that individuals still have a highly variable treatment of /R/ and /Q/ in the creation of new CALs.
- /R/ and /Q/ were deleted in less than 30% of cases (see fig.1).

⇒ The regularity in attested forms, representing the regularization at a community-level, does not reflect the distribution of preferences in individuals’ grammar.

**New experimental approach:**
Questions arising from previous results:
- How can regularity emerge at community-level when individuals have different preferences?
- What community-level factors play a role in the regularization process?

**Multi-player online game (see Fig.2):**
- Players create new CALs together.
- Players assign names to imaginary creatures.
- Players are motivated to anticipate group-level outcomes.
  - E.g., they get more points if everyone in a group chooses the same name.

- Focus on how players converge on naming solutions when variation in the grammar presents multiple options (e.g., when /R/ or /Q/ should appear at the end of a CAL).

**Community-level parameters:**
- The size of groups of players (Derex & al., 2013)
- Connections within and between groups (i.e., network structure, Derex & Boyd, 2016)
- Mode of interaction (e.g., negotiation via chatbox).
- Social factors (e.g., variant prestige, Tamariz et al., 2011)
- Distribution of biases in the community (Pierrehumbert et al., 2014)
- ...

**Main objectives:**
- Explain discrepancy between individual-level and community-level preferences.
- Identify the role of different community-level factors in the process of regularization.

**Next steps:**
- Complete the creation of the game (select items, design the creatures, run tests, ...).
- Create multiple versions with different parameter manipulations.
- Collect the data.
- Analyze the data: what factors significantly influenced the players’ attitudes and scores? In what way?
- Conduct agent-based modeling simulations (Netlogo) and compare to empirical results. (Wilensky, 1999)

**References:**

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