Tracking Tip-of-the-Tongue States in a Multilingual Speaker: Evidence of Attrition or Instability in Lexical Systems?

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The issues

• TOTs experienced and recorded by one of the authors over a period of ten years while he was living in the US and Mexico.
• Whether a multilingual speaker’s development of an L3 (English) and an L4 (Spanish) results in observable L1 attrition as reflected in TOTs and the activation of intralingual and interlingual associates in word search.
• Whether the L1 is affected in a different way from other languages known or used.
• The kind and relative degree of attrition and cross-linguistic interaction in each period.
• The data are analyzed with respect to four time periods corresponding to significant changes in language learning/usage patterns
Four periods of the speaker's language acquisition history and "language-related major life events"

- **1994-1995**: Peter lives in the USA, speaking mostly English, but teaches some German, starts to learn Spanish and Portuguese, and reactivates his Russian.
- **1996-1997**: Peter lives in Mexico, speaking mostly Spanish, but also uses English regularly and continues to teach German; he seldom uses Russian or Portuguese.
- **2000-2001**: Peter lives in the USA, speaking mostly English, but teaches more German than previously; having married a Spanish speaker in 1998, Spanish is his home language, but is not used extensively elsewhere.
- **2003-2004**: Peter continues to live in the USA and his three major languages stabilize.

The Speaker’s Language Use History (1994-2004)

![Graph showing language use frequency over years](image)
• **English**: used most frequently 1994-1996 and after 2000.
• **Spanish**: used most frequently 1996-2000.
• **German**: used throughout, but made up only 10-20% of the languages used per period.
• **Portuguese and Russian**: restricted mostly, but not exclusively, to school contexts in 1994-1995.

• **Overall proficiency order**: L1 German > L3 English > L4 Spanish > L2 Russian > L5 Portuguese

**Method**

• Cognitive Diaries (Reason & Lukas, 1984)
• Records in diary sheets include:
  – partial knowledge about the target
  – any associations made during word search
  – the target word
  – Approximate time from onset of TOT to association and target recall
Three main indicators of activation level and attrition of languages:

- the relative frequency of TOTs in each language in relation to other languages and to estimated frequency of use,
- the relative frequency of contribution by each language to interlingual associations in other language TOTs,
- the relative frequency of contribution by each language to intralingual associations in same language TOTs.

**Hypothesis 1:**
- Higher adjusted rates of TOT occurrence overall in languages that have lexicons with less stable representations and access routes.
- \( \text{ENG} < \text{SPA} < \text{GER} < \text{RUS} \)
- Fluctuation of TOT rates over time in response to dynamic patterns of language usage and maintenance
Interlingual Associations

Hypothesis 2

• Language A will contribute fewer interlingual associates during TOTs in language B in periods in which language A is not used frequently and/or is not maintained through study activity.
• Hence, English should be a constant source of interlingual associates throughout, whereas German should decrease with lack of maintenance.
• Russian and Spanish should yield fewer associates overall, and should fluctuate with usage and maintenance.
• Expected order of influence as source language for interlingual associations is:
  • ENG > GER > SPA > RUS

Intralingual Associations

Hypothesis (3)

• We expect fewer intralingual associates for a language in periods in which the language is (a) not being used very frequently and/or (b) is not being maintained through study activity.
• Hence, we expect the internal dynamics of availability of target language associates to be similar to what we predicted for interlingual associates, and for the languages to follow the same order overall:
  • ENG > GER > SPA > RUS
Results and Discussion

- 108 TOTs and 365 word associates

- TOTs were experienced with
  - Spanish L4 words (38%)
  - English L3 words (36%)
  - German L1 words (15%)
  - Russian L2 words (11%)

Frequency of Adjusted TOT Rates (Hypothesis 1)
We expected the following order: ENG < SPA < GER < RUS.
• Findings confirm the predicted order for the most part.
• Unexpectedly, the L1 data show dynamic fluctuations which suggest that attrition over time was not occurring.
• Adjusted L1 German TOT rates for the first two periods are higher than those for English and Spanish, and are topped only by Russian.
• Russian, in the periods in which it produces TOTs, results in the highest adjusted TOT rates, reflecting strong attrition.
• Spanish TOT rates are higher than the English rates and increase with time, suggesting that the language remains unstable and becomes increasingly vulnerable to retrieval failure.
• Portuguese yielded no TOTs at all.
• The frequent use of English, Peter's other relatively stable language, produces low adjusted TOT rates throughout.

Rate of Interlingual Associations in Other Language TOTs
(Hypothesis 2)
Expected general order: ENG > GER > SPA > RUS
• Most predictions are confirmed by the general pattern of findings.
• But again the L1 appears to resist attrition over time, despite its relative infrequency of use.
• English and German were the most available competing languages during word search.
• The trend: L1 influence increased with time whereas L3 influence remained stable, in general below L1.
• Words of the reactivated Russian L2 and recently learned Spanish L4 contributed relatively little to interlingual associations.

Figure 6. Percentage of Intralingual Associates for Each Language (Hypothesis 3)
We expected the following order: ENG < GER < SPA < RUS
• The two more stable languages again behaved more similarly than the two less stable languages.
• L1 German (with 89% intralingual associates against 80.9% for English) once more proved the more stable of the two, despite usage disparities, with its lowest level of internal competition during the unstable 1994/1995 period.
• Among the less stable pair, Russian TOTs provoked 75% intralingual associates concentrated in two of the four periods, and Spanish, with 67.3%, stayed reasonably level, but with a dip in 2000/2001 after Peter left Mexico.

Summary and Discussion of Findings: The L1

• All three indicators suggest that the speaker’s L1 system is stabilizing over time after a period of relative instability
  – characterized by competition from recently learned L4 and L5,
  a reactivated L2, and a relatively frequently used L3.
• The stabilization of the L1 over time was unexpected, although similar findings have been reported for bilingual immigrants (de Bot & Clyne, 1994).
• The increased time away from a German-dominant environment and the relatively infrequent use of the L1 throughout are factors which might have been thought to induce attrition
• At first sight, this seems to confirm the assumption that a part of the language system is highly resistant to loss (de Bot, Lowie & Verspoor, 2007) and that
• frequency and recency of activation seem to play a less prominent role in L1 attrition (Schmid, 2007), providing that a certain threshold in L1 proficiency (complexity and stability) has been reached.
• However, if attrition is understood to include the temporary impairment of access to a language, then our data suggest at least some attrition of L1 word retrieval earlier in the period studied.
• During this phase, the speaker’s interacting language systems appear to have come out of balance due to his increased efforts in learning new languages at the cost of maintaining others, including the L1.

• The multilingual speaker’s language learning and use history and the dynamically changing patterns of word retrieval suggest that:
• Neither language learning nor attrition can be assumed to be the one-way streets that they have been perceived of too often.
• Multilingual speakers go through periods of relative instability and balance.
• Ease of access to first and second languages fluctuates in non-linear ways (de Bot et al., 2007, Jessner, 2003).
• Peter’s L3 (English) has been relatively stable throughout the study period.
Peter’s L2 (Russian) and his L4 (Spanish)

- In comparison to the L1, both languages appear more vulnerable to reductions in language maintenance effort and reduced usage.
- We found evidence of attrition for Russian
  - which had been re-activated after a long period of non-use and which generated very high rates of TOTs relative to frequency of use.
- Interestingly also Spanish, his frequently used and relatively late learned L4 showed signs of attrition
  - after his return to an English-dominant environment, despite its continued use in the home.
- The case of Spanish is suggestive of regression.
  - Late learned (and still relatively unstable) structures are affected first by attrition.

Conclusion and Outlook

- Research based on a single case cannot be generalized.
- However, it is hoped that this study will stimulate more longitudinal research into dynamic aspects of multilingual speakers' lexicons.
- Of particular research interest are periods of (abrupt) change that require multilingual speakers to adjust their language system to requirements of a new environment.
- Comparing only an initial state and an endpoint with respect to changes in L1 and L2 proficiency will often overlook non-linear changes including periods of instability, attrition, relearning, and stabilization in the speakers' lexicons.
Selected Bibliography


