When Frequency Is Not Enough: Explaining Bilingual Children’s Morphological Acquisition

Johanne Paradis, University of Alberta
Elena Nicoladis, University of Alberta
Martha Crago, Université de Montréal

Child Language Seminar, Newcastle upon Tyne, July 2006

Usage-Based Theory and Bilingual Acquisition

• Input structure and frequency key mechanisms underlying acquisition patterns (Tomasello, 2003)
• Simultaneous bilinguals have their input space divided between two languages, so less exposure to each language
• UB Theory predicts that bilingual children would lag behind monolinguals in achieving acquisition milestones (Tomasello, 2004)
Bilingual Acquisition of Morphosyntax

• School-age children:
  - language-at-home & language-at-school input measures impact on bilingual children’s rate of morphosyntactic acquisition (e.g. Gathercole, 2002; 2006)

• Preschool/kindergarten children:
  – Conflicting findings on whether bilinguals always lag behind monolinguals (Erdő et al, 2005; Gathercole & Thomas, 2005; Marchman et al, 2004; Nicoladis et al, in press; Paradis & Genesee, 1996; Paradis et al, 2003)

Critical Mass, Complexity and Morphology

• Ceiling in performance (unlike vocabulary), so bilinguals may “catch up” faster to monolinguals
• Critical mass of input needed varies depending on complexity of morphology to be acquired
  – Transparent vs. opaque
• Bilingual-monolingual differences are in rate, not sequences of acquisition

§ Among bilingual homes, does dominant language make a difference?
§ How is transparency/opacity defined?

(N. Ellis, 2002; Gathercole, 2002, 2006; Gathercole & Hoff, in press)
Defining Opacity/Transparency:

- Bybee’s exemplar-based model of the lexicon - inflectional morphology
- Past tense forms in French and English

Exemplar-Based Model of the Lexicon

- Multi-morphemic words stored fully inflected and inter-connected by
  - phonological form
  - Semantic features
- Token frequency in input and output = increases lexical strength of stem and stem +morpheme constructions

Exemplar-Based Model of the Lexicon

- Type frequency (number of unique stem+morpheme constructions in lexicon) increases schema strength
  - Schema = rules like [verb [-ed]] = past tense reference
  - Type frequency = critical mass for productive and accurate use of inflection
- Irregular forms = inflectional islands
  - Sensitive to token frequency in becoming established
  - Subject to overregularization due to superior strength of regular schema

Past Tense in French and English

• English simple past
  – regular [-ed] and irregular strong verbs
    he walks / he walked; she takes / she took / *she taked
• French passé composé
  – avoir/être + past participle
  – 1st conjugation: “regular” (based on type frequency)
    marcher: Il marche / Il a marché (er = é)
  – 2nd & 3rd conjugation: families of “irregulars”
    prendre: elle prend / elle a pris / *elle a prendu / *elle a prenné
    ouvrir: Il ouvre / il a ouvert / *il a ouvri / *il a ouvré

Exemplar-Based Model and the Past Tense in French and English

• Transparent morphology = high type frequency of schema
• Irregular verbs are more opaque than regular verbs - fewer types for each pattern/unique types for some patterns
• Irregulars would be later-acquired than regulars
• Irregulars particularly vulnerable in case of reduced input

NB: Words & Rules similar predictions for regulars and irregulars
Acquisition of the Past Tense in English and French

• Regular past tense
  – >90% correct at 4;6-4;11 in English (Rice & Wexler, 2001)
  – >90% correct at 4;0-6;0 in French (Jakubowicz & Nash, 2001; Paradis & Crago, 2001)

• Irregular verbs
  – Accuracy with irregulars as a group lags behind regular verbs in both English and French (Rice & Wexler, 2001; Nicoladis et al, in press)
  – Overregularization errors found in both English and French (Marchman & Bates, 1994; Marcus et al, 1992; Nicoladis et al, in press)

Do bilinguals lag behind monolinguals in their acquisition of the past tense?

1. Difference between bilinguals and monolinguals smaller for bilinguals’ dominant language
2. Difference between bilinguals and monolinguals smaller for regular than irregular past tense
3. No difference in bilinguals and monolinguals in acquisition sequences
   • regulars >> irregulars
   • overregularization errors
Participants

- 23 French-English bilingual children aged 4;0-5;5 (simultaneous and early sequential)
- 6 French monolingual children same age range (more to come…)
- Children residing in Edmonton, Canada
- All children were attending French-language preschool or kindergarten

Procedures

- Parental questionnaire on input patterns
- Peabody Picture Vocabulary Test (PPVT-III: Dunn & Dunn, 1997)
- Échelle de vocabulaire en image Peabody (EVIP: Dunn et al, 1993)
- Past tense probe from the Test of Early Grammatical Impairment (TEGI: Rice & Wexler, 2001)
- Passé composé probe (experimenter-made)
Past tense probe: TEGI

“Here, the boy is painting. Now he is done. Tell me what he did”

Passé Composé Probe

“Camille vend du lait aux élèves dans sa classe. Maintenant elle a fini. Dis-moi ce qu’elle a fait.”
Camille is selling milk to the pupils in her class. Now, she’s finished. Tell me what she did.
Language Dominance

- Dominant language = language for which child receives more input
- Measures
  - simultaneous versus early sequential
  - rating scales of use of that language in the home by each parent to the child
  - EVIP and PPVT z scores: verify categorization; break a tie for two children
- Children grouped as French or English dominant

English criterion-referencing (TEGI)

- 61% of all bilinguals scored at or above the age-expected criterion score for typical language development on past probe as a whole (regular and irregular combined)
- 87% of English-dominant bilinguals scores at or above criterion for probe as a whole
Irregular finite = irregular verbs correct + “overregularized”

2X3 mixed ANOVA produced significant main effects for language group and past tense type, but no significant interaction. Regulars > irregulars. French dominant bilinguals = monolinguals for regulars and irregulars.
Irregular finite = irregular verbs correct + “overregularized”

**Discussion and Implications**

- Bilinguals show the same acquisition patterns as monolinguals overall
  - regulars > irregulars in English and in French
  - overregularization errors in English and French
- Bilinguals = monolinguals in their dominant language for regular past tense & irregular past finite
- Bilingual-all/monolingual differences smaller in older children in English
- Bilinguals more difficulties with irregular verbs in English than in French
  - English irregular verbs = greatest differences between bilinguals and monolinguals
Discussion and Implications

- Bilingual morphosyntactic acquisition is vulnerable to these children’s reduced and variable input (predicted by UB Theory) - but not global delay
- Interacting factors important - no bilingual-monolingual differences for transparent morphology
- School readiness/language assessment: language dominance of child and transparency/opacity of target structure being probed are crucial to keep in mind

Many thanks to research assistants Aimée Berubé, Heather Golberg, and Tamara Sorenson

This research was funded by the Alberta Heritage Foundation for Medical Research and by the Social Sciences and Humanities Research Council of Canada

johanne.paradis@ualberta.ca
http://www.ualberta.ca/~jparadis/
Selected References

Ellis, N. (2002). Frequency effects in language processing. SSLLA, 24, 143-188.