

# HOW DOES AGE OF ONSET AFFECT L1 ATTRITION IN BILINGUALS?

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# WHEN IS A BILINGUAL AN ATTRITER?

- all of a bilingual's languages are active at all times
- all of a bilingual's languages interact with each other at all times
- can we separate “the normal influence between languages in a bilingual or polyglot“ (Ahlsén, 2013) from the – consequently abnormal – process of attrition?

# WHEN IS A BILINGUAL AN ATTRITER?

- this concern goes back to Seliger & Vago's (1991) model of bilingualism and attrition:
  - Compound Bilingualism I: traffic mainly or exclusively L1-to-L2
  - Coordinate Bilingualism: both languages exist largely independently from each other
  - Compound Bilingualism II: speaker is fluent in L2, traffic from Stage I is reversed, L2 'encroaches' on L1 => attrition occurs

# WHEN IS A BILINGUAL AN ATTRITER?

- the prevailing assumption appears to be that language attrition is
  - “is a special case of variation in the acquisition and use of a language” (Andersen, 1981)
  - occurs in “extreme situations of reduced L1 use” (Costa & Sebastián-Gallés, 2014)
- and that “it is erosion that reaches the level of competence that allows for interesting claims about and meaningful insight into the attrition process” (Seliger & Vago 1991: 7)

# WHEN IS A BILINGUAL AN ATTRITER?

- drawing a line between ‘normal’ bilingual interaction and ‘abnormal’ attrition could be done based on the following criteria
  - extralinguistic criteria:
    - a specified length of residence (LoR), e.g. > 10 years
    - a maximum threshold of exposure (how to measure?)
      - completely arbitrary (and may interact with each other)
  - linguistic criteria:
    - a specified level of proficiency (how to measure?)
    - processes of crosslinguistic interference that are somehow distinct

# HOW LONG DOES ATTRITION TAKE?

- on 31.5.2014, Sgt. Bowe Bergdahl was released after 5 years of Taliban captivity
- in a press conference at the White House, his father claimed that Bowe had 'trouble speaking English'
- the Twitter community responded in force:



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**ForGodAndCountryInSC** @NCNolesFan · 5 Jun 2014

What? He forgot he was American maybe. "[@washingtonpost](#): Could **Bowe Bergdahl** really forget how to speak **English**? [In.is/wapo.st/G6JSG](http://In.is/wapo.st/G6JSG)"

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**OYAHHH** @OYAHHH · 1 Jun 2014

I call BS! **Bowe Bergdahl** cannot speak **English** anymore??? I smell a RAT! He is attempting 2 avoid public persecution. Signs of a traitor.

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**ROCKWITHBECK** @ROCKWITHBECK · 1 Jun 2014

@infidelpamelaLC @bnmil @bobbergdahl - **Bowe Bergdahl** is 'PLAYING TO HIS AUDIENCE - With his failure to remember -- **ENGLISH. NONSENSE!**

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**NevadaTeaParty** @TeaPartyNevada · 4 Jun 2014

Obvious lie by father saying son was having trouble w/**English**: **Bergdahl**:  
Could he have lost **English** skills? [usat.ly/1mTCluC](http://usat.ly/1mTCluC) usatoday

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general view: one does not lose one's native language within 5 years

hl:

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(in particular if that language happens to be American, of course!)

# HOW LONG DOES ATTRITION TAKE?



25. Februar 2008 14:02



# HOW LONG DOES ATTRITION TAKE?

25. Februar 2008 14:02



**Steffi Graf**

**„Sorry, ich kann nicht mehr so gut Deutsch“**

Posten Sie (0) Leute

© APA

0

Empfehle

Teilen

Twitter



# HOW LONG DOES ATTRITION TAKE?



The screenshot shows a news article from the website SOCIETY24. The header includes navigation links for OE24, ÖSTERREICH.AT, GESUND24, BUZZ.AT, MADONNA, and WI. The main navigation bar lists NEWS, MONEY, SPORT, LEUTE, UNTERHALTUNG, and DIGI. The article is dated 25. Februar 2008 14. The main image shows Steffi Graf kissing a man. Below the image is a red caption that reads "Steffi Graf". The headline of the article is "„Sorry, ich kann nicht mehr so gut Deutsch“". At the bottom of the article, there are social media sharing options for Facebook (Empfehlen), Twitter, and a "Teilen" button. A red button at the bottom left says "Posten Sie (0)".

Steffi Graf moved to the US in 2000

at a media award ceremony in 2008 she said that ‘her German was no longer that good’

(her short speech was your basic train crash...)

this statement made all the headlines

(but since she is Steffi Graf and everyone loves her, she was forgiven...)

# ACTIVATION AND INHIBITION

- language attrition effects are a matter of decreased activation of the L1 and failure to inhibit the L2
- these processes fluctuate according to the circumstances
- in the early stages of L2 acquisition, the L1 is inhibited most forcefully, to allow activation of the (still weak) L2 representations
- overriding this may be more effortful (and thus sometimes unsuccessful)

# THE TIMECOURSE OF ATTRITION

- we know very little about L2-to-L1 interaction in the early stages of SLA, but isolated findings show that:
  - lexical access becomes compromised after one term of immersion in a study abroad context (Baus, Costa & Carreiras, 2013)
  - L1 phonetic settings adapt towards the L2 after a six-week intensive language course (Chang, 2012)
  - attrition effects have been found to be stronger with LoR <5 years than with LoR >12 years (Beganovic, 2006)
- imposing a time limit does not make sense

## ‘USE IT OR LOSE IT’???

- is attrition a process that only occurs in “extreme situations of reduced L1 use” (Costa & Sebastián-Gallés, 2014)?
- this still seems to be what most people think
- there is very little empirical evidence for it!

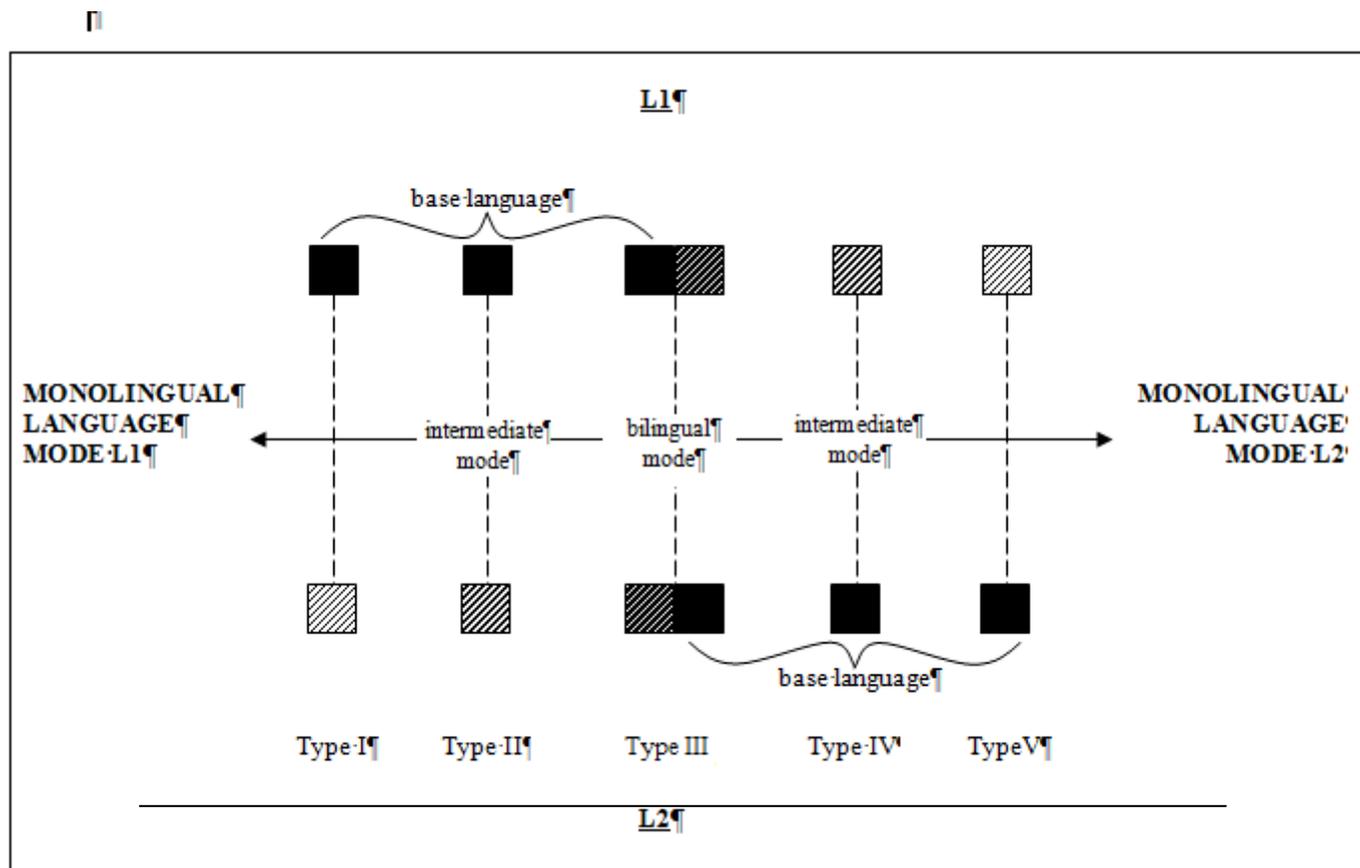
# THE LIMITED IMPACT OF L1 USE

- many studies have attempted to find correlation
- it has rarely worked (e.g. PhD studies by Yilmaz, Dostert, Bergmann, Karayayla, Varga, studies by Schmid & Dusseldorp, Schmid & Jarvis, de Leeuw et al...)
- some recent work suggests complex interaction
- one factor seems to help: L1 for professional purposes (Steinkrauss et al., in prep, Schmid & Dusseldorp 2010)

## L1 USE – WHAT’S THE STORY?

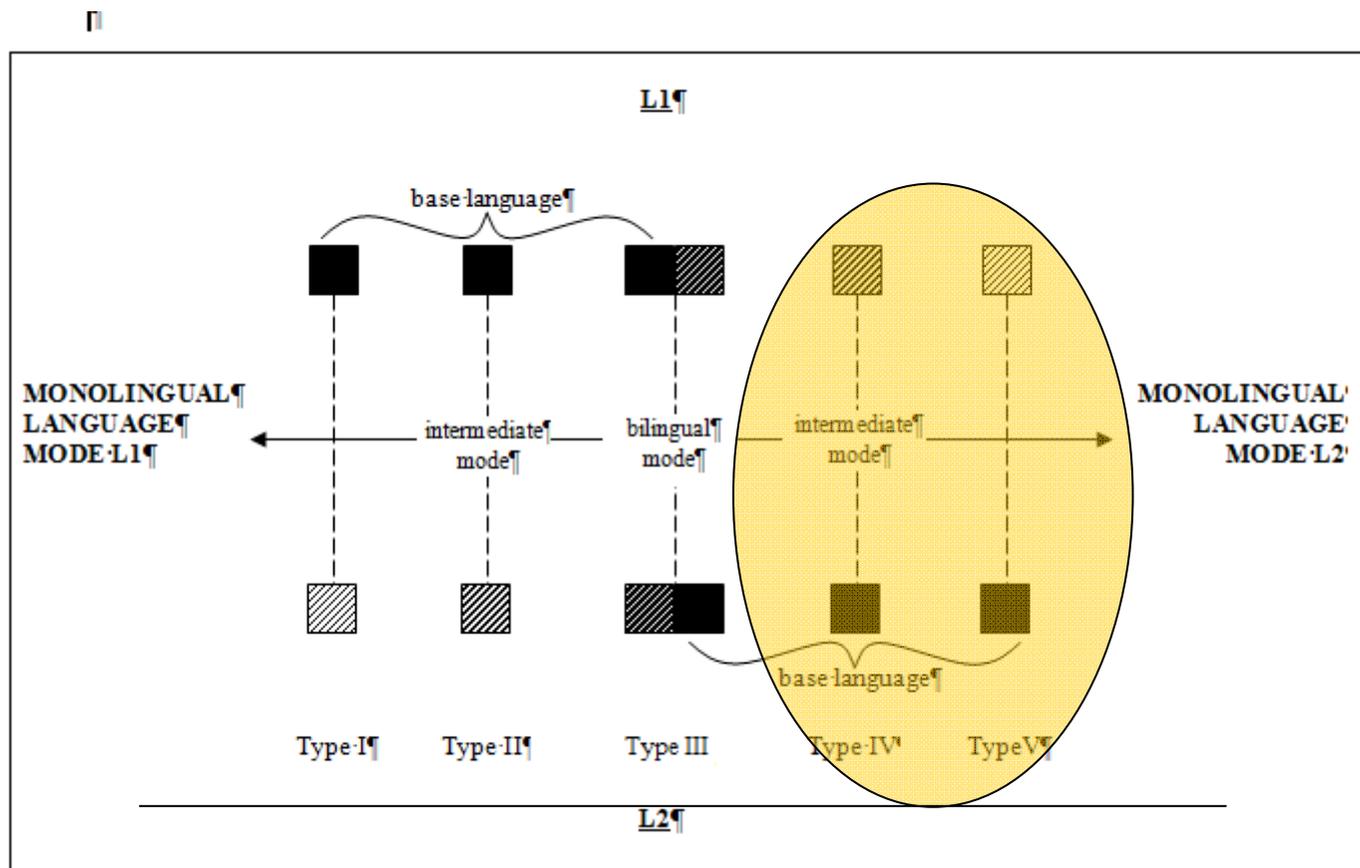
- Grosjean’s (2001) model of language mode: in bilingual mode, code-switching is accepted and neither language has to be inhibited
- in monolingual mode, one language is largely deactivated
- in intermediate mode, both languages are active, but one has to be inhibited

# TYPES OF L1 USE AMONG EMIGRANTS



Schmid (2007: Fig. 2)

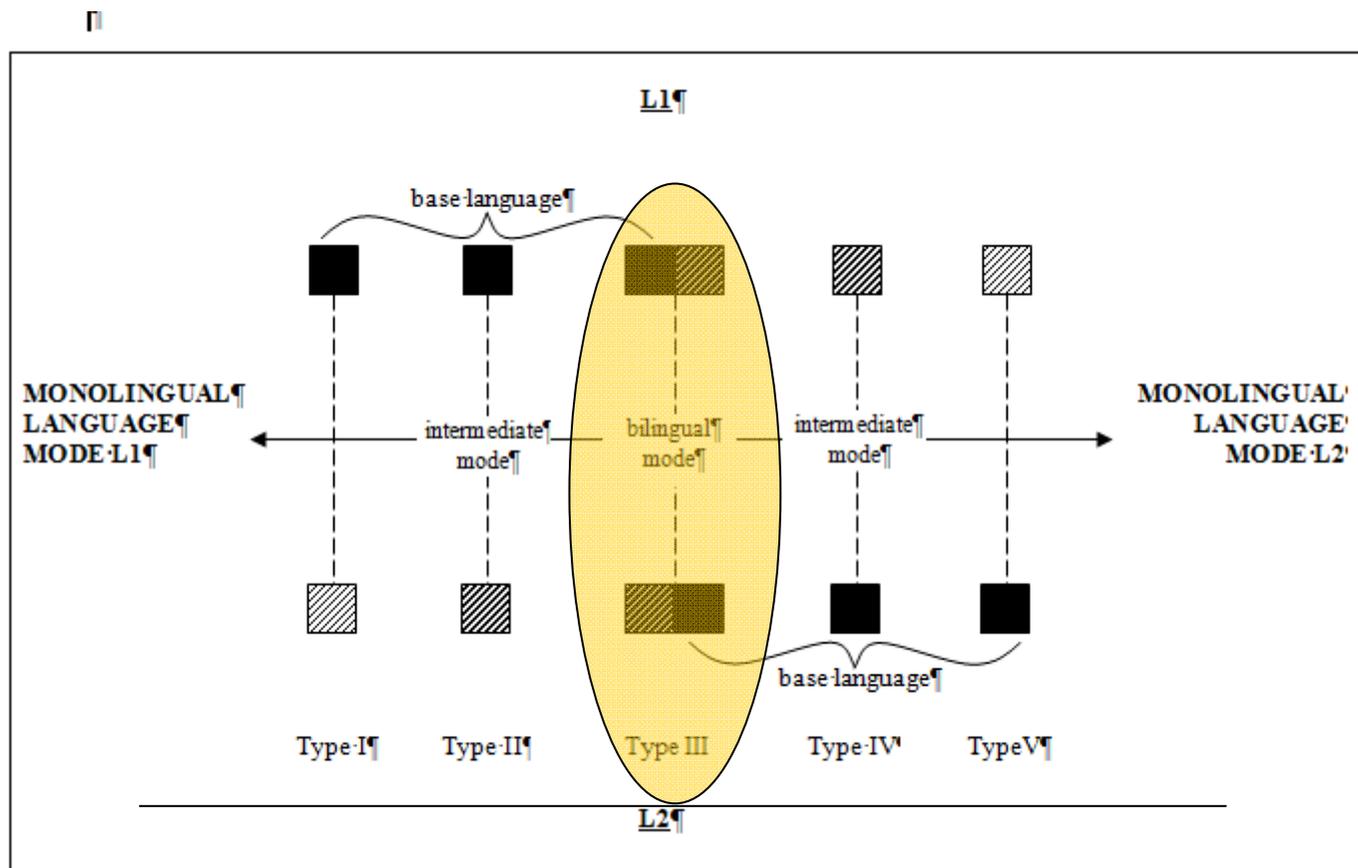
# TYPES OF L1 USE AMONG EMIGRANTS



most people do this (a lot)

Schmid (2007: Fig. 2)

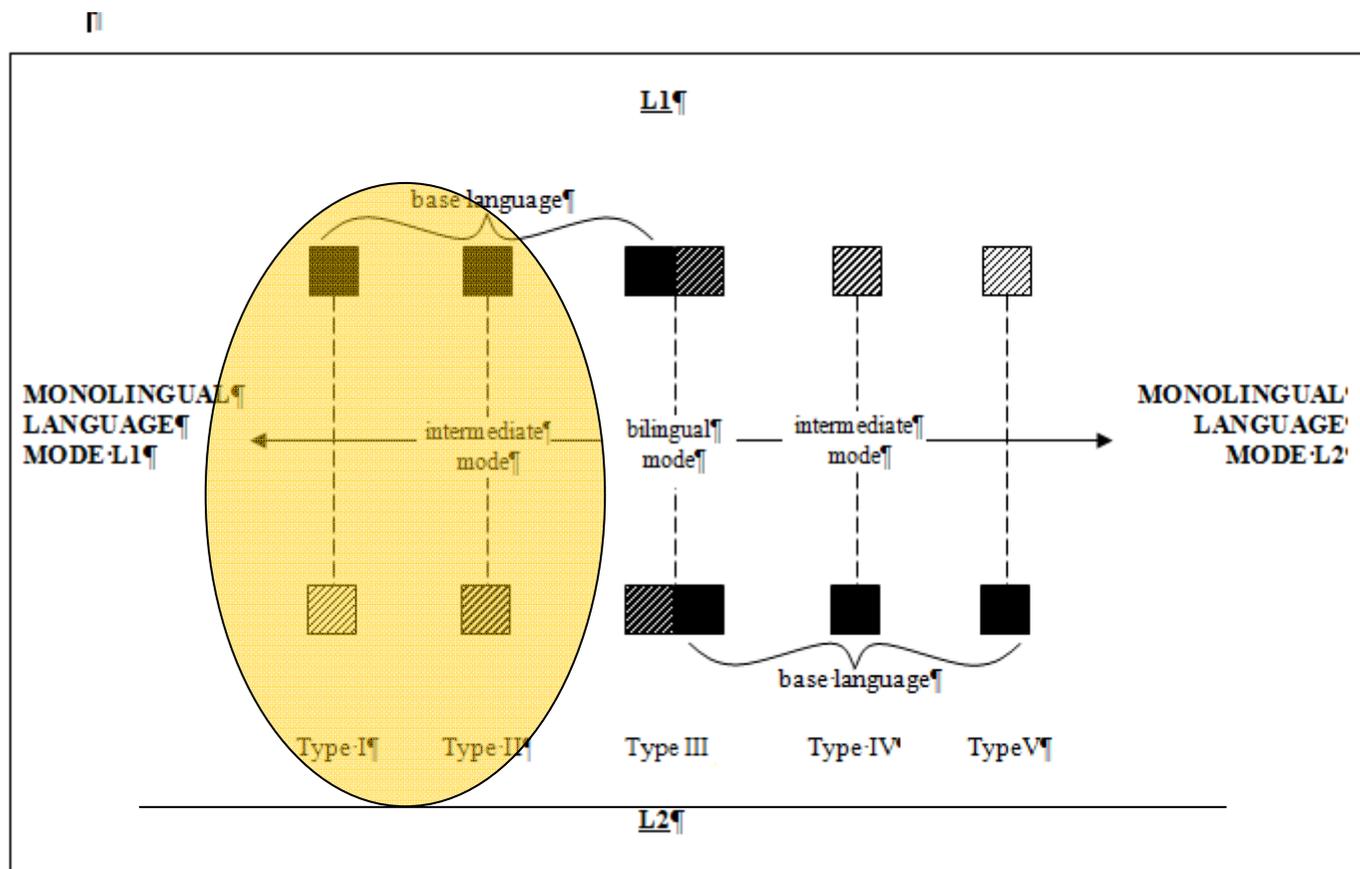
# TYPES OF L1 USE AMONG EMIGRANTS



many people do this (quite a lot)

Schmid (2007: Fig. 2)

# TYPES OF L1 USE AMONG EMIGRANTS



not everybody  
does this

Schmid (2007: Fig. 2)

# L1 USE – WHAT’S THE STORY?

- most emigrants have a lot of practice inhibiting their L1 (they often speak the L2 with others who do not know their L1)
- as the L2 becomes dominant, it becomes harder to inhibit
- in many (informal) situations of L1 use, it is not necessary to inhibit the L2 (with other migrants)
- practice in using L1 while inhibiting L2 is what prevents attrition effects
- this happens mainly in work–related settings and when travelling home

# ACCESS, ACTIVATION AND INHIBITION

- attrition is not so much a matter of ‘erosion’ of knowledge, but of inhibition of competitors
- the question of use is more a question of use in contexts where inhibition is necessary
- we need to look more to profiles of L1 users and investigate the types of contact
- ... but attrition is definitely not confined to ‘extreme situations’ of disuse!

# ‘NORMAL INTERACTION’ vs. ATTRITION?

- there are many attempts at definitions of attrition
- BUT: what does attrition actually look like?
- what do attriters do differently from monolingual NSs?
- what do attriters do differently from other bilingual NSs?

# ATTRITION OF LEXICAL KNOWLEDGE

- Lexical knowledge is vulnerable in the attritional process and may be affected at an early stage
- Lexical attrition can manifest itself in
  - lexical access problems (naming tasks, diminished vocabulary in free speech)
  - decrease in fluency (hesitation phenomena, slower speech rate)
  - borrowings, calques, blendings, code-mixings etc.

# ATTRITION OF STRUCTURAL KNOWLEDGE

- grammatical knowledge is far more stable
- UG approaches assume that ‘core syntax’ is invulnerable to attrition, but interface phenomena may be subject to interlanguage phenomena
- grammatical ‘attrition’ might manifest itself in
  - impaired performance on GJ tasks (online/offline?)
  - a reduction in sentence complexity (?)
  - allomorphic reduction (?)
  - a foreign accent

# BILINGUALS AND ATTRITERS

- there are many differences between bilinguals and monolinguals
- there are many differences between attriters and monolinguals
- there are no differences between bilinguals and attriters
- every bilingual is also an attriter

# EVERY BILINGUAL...?



# THE AGE FACTOR IN L1 ATTRITION

- born in L2 environment:
  - heritage speaker
- migration before ~ age 12:
  - incomplete learner
- age at migration 13+ years
  - L1 attrition

# ATTRITION AND INCOMPLETE ACQUISITION

- incomplete acquisition
  - Property A
  - present in the input
  - begins to be acquired
  - never fully mastered
- attrition
  - Property B
  - present in the input
  - fully mastered at an earlier age
  - at the current age either produced with high error rate or not present at all

# PROFICIENCY ISSUES IN EARLY BILINGUALS

- heritage speakers resemble L2 learners in many ways (Montrul, 2008)
- will usually eventually become dominant in the L2 even if heritage language is language of family and they are embedded in substantial community (Huls & van de Mond, 2002; El Aissati & Schaufeli, 1998)
- may show stable, target-like development on some areas of L1 grammar (Gürel & Yılmaz, 2011)
- may have persistent deficits in L2 grammar even though they consider themselves L2-dominant (e.g. Dutch gender, Seton, 2009)

# POSSIBLE REASONS FOR DIVERGENCE

- the input HLs receive might be defective (Verhoeven 2004) or reduced (Unsworth et al. 2011)
- the L1 has a limited domain of use
- lack of schooling in the L1 (Rothman 2007)
- attrition due to disuse (Polinsky 2011)
- the age of bilingualism: early onset = less HL proficiency (Montrul 2008)

# AGE AND ATTRITION EFFECTS

- heritage speakers:
  - exposed to home language in childhood, L2 acquired between 0 and 5
  - tend to become dominant in L2, proficiency in L1 variable, unstable and impossible to predict
- attriters:
  - exposed to L1 until puberty, then migrate and become bilingual
  - L1 attrition effects usually small, L2 proficiency extremely variable
- what happens in age range between ca. 5 and ca. 12?

# MIND THE GAP

- extremely few studies have looked at AoAs in the intermediate range, e.g.
  - lexical retrieval performance of Dutch–English bilinguals ( $6 < \text{AoA} < 29$ ) (Ammerlaan 1996)
  - L1 pronunciation of Korean–English bilinguals ( $1 < \text{AoA} < 24$ ) (Yeni-Komshian, Flege and Liu 2000)
  - L1 goal-oriented motion events performance in Spanish–Swedish bilinguals ( $1 < \text{AoA} < 19$ ) (Bylund 2009)
  - L1 proficiency of Mexican–English bilinguals ( $0 < \text{AoA} < 6$   $10 < \text{AoA}$ ) (Hakuta and D’Andrea 1992)
  - verb placement/object realization in bilingual returnees (Flores 2012)

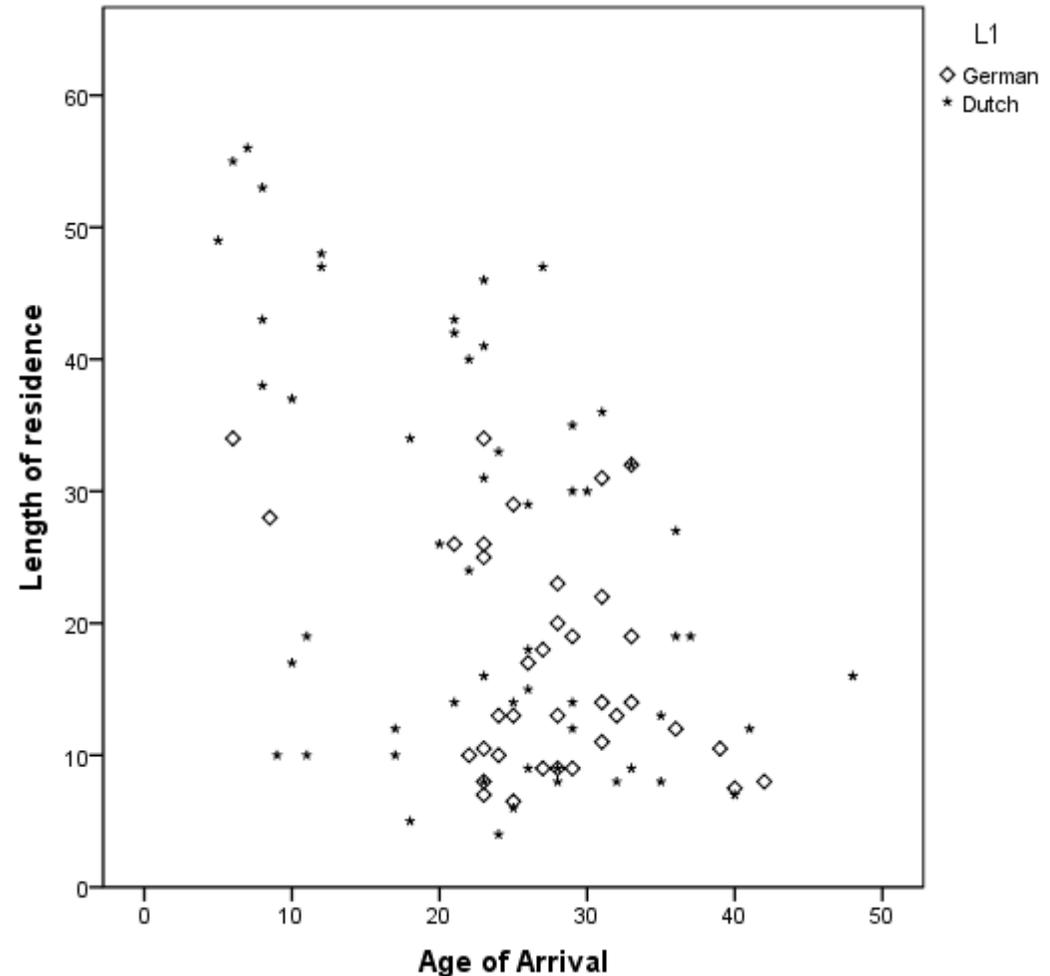
# RECRUITMENT ISSUES

- finding participants in this age range is extremely difficult



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- finding participants in this age range is extremely difficult
- e.g. EEG investigation (with Sanne Berends, Christopher Bergmann, Susanne Brouwer, Nienke Meulman, Bregtje Seton, Simone Sprenger & Laurie Stowe)



# AGE-EFFECT IN PRONUNCIATION (Yeni-Komshian, Flege & Liu 2000)

- investigate both L2 and L1
- participants: 240 Korean-English bilinguals, 24 Korean monolinguals, 24 English monolinguals
- AoAs perfectly distributed in 3-year increments

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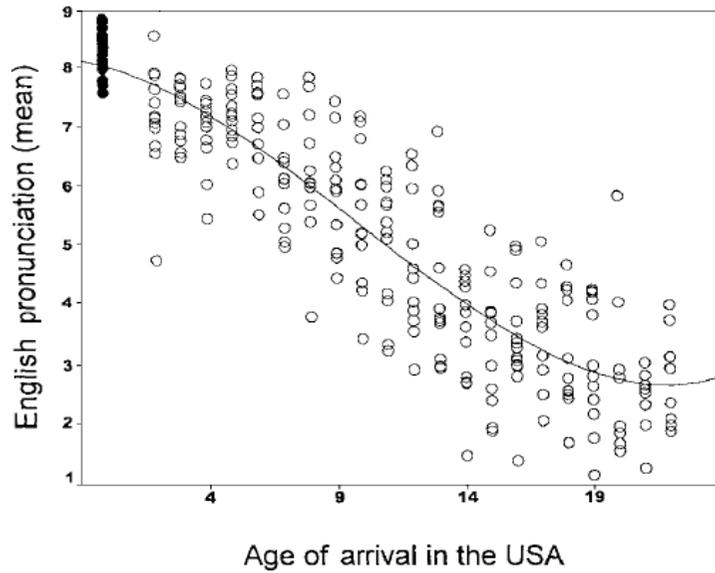


Fig. 1,  
p. 138

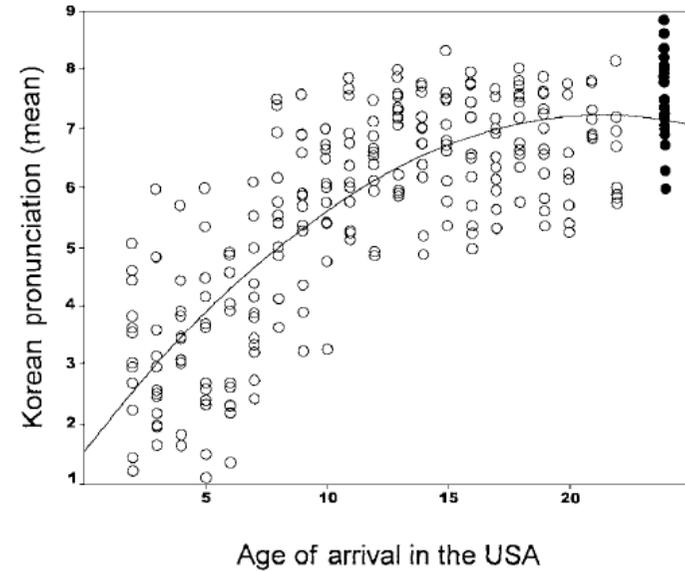


Fig. 2,  
p. 138

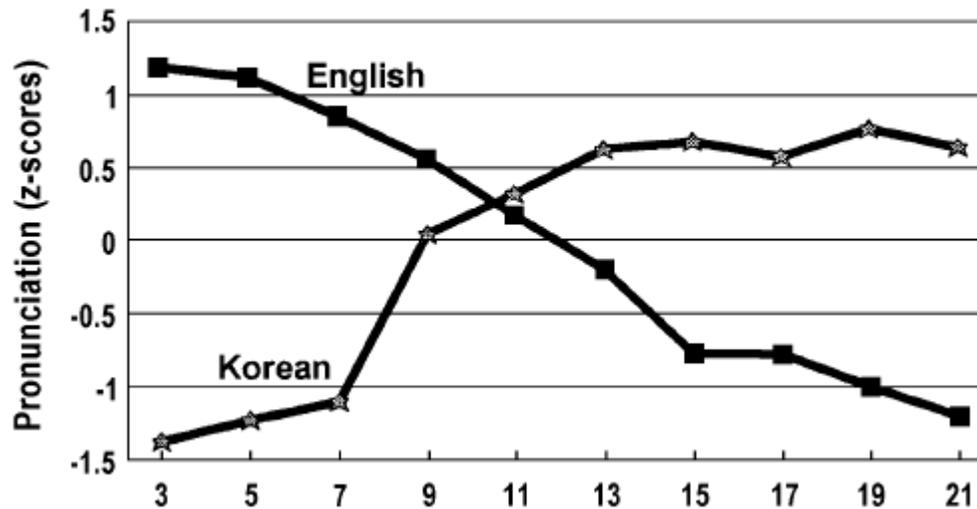


Fig. 3, p. 140

AoA 1–9: ENG > KOR

AoA 10–11: ENG = KOR

AoA 12–23: KOR > ENG

# AGE-EFFECT IN PRONUNCIATION (Yeni-Komshian, Flege & Liu 2000)

“[...] the Korean pronunciation of the majority of immigrants who came to the USA at age 12 or later was rated at the same level as Korean monolinguals residing in Seoul. The younger immigrants (AOA 1–11) were rated significantly lower than monolinguals and the lowest scores were mostly for those whose AOA ranged from 1 to 7 years.” (p. 140)

# GREEK–ENGLISH BILINGUALS, MORPHOSYNTAX

(Pelc, 2001)

- 57 Greek–English bilinguals, AoA 8–32, LoR 10–40 years, 21 Greek monolingual controls
- offline grammaticality judgment tasks of a variety of features, including case and gender
- monolinguals outperformed bilinguals on all agreement features
- AoA was strongly correlated with all of these features (LoR was not)
- the distribution of age ranges is not given, she only says that most of her participants were 12–19, but not how many were below (or above) that age

# DUTCH–ENGLISH BILINGUALS, LEXICAL ACCESS

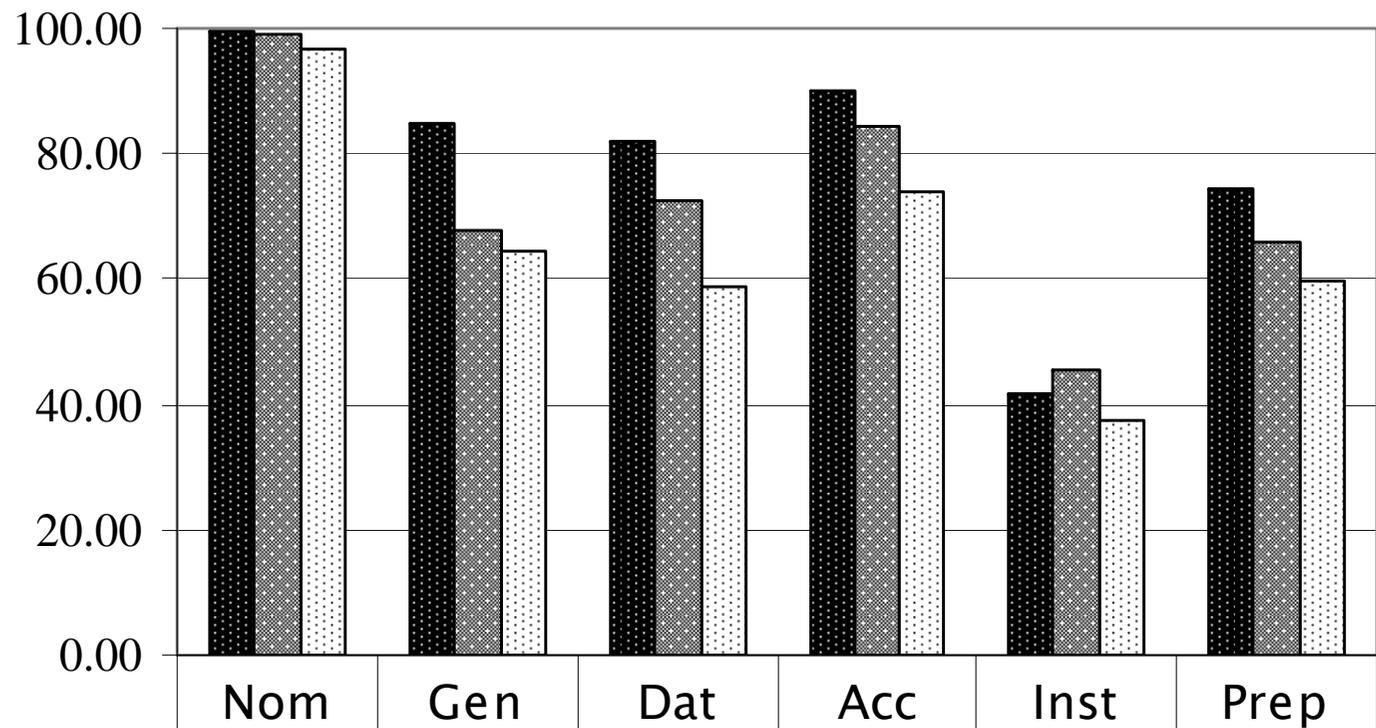
(Ammerlaan, 1997)

- tests lexical attrition in Dutch–English bilinguals in Australia
- 76 bilinguals, AoA 0–30 years
- verbal fluency, picture naming, picture–word matching
- AoA is the most important factor

# RUSSIAN-ENGLISH BILINGUALS, CASE MARKING

(Schmitt, 2004, 2010)

- Schmitt (2004): investigates five Russian children who emigrated to US with their parents, aged 4
- two testing moments: first 4–5 years after emigration (age 9.5), second two years later
- Schmitt (2010): five adults, AoA 8–10, LoR 20+ years
- attrition appears to take place early and then level off
- no age benefit in older group



■ Schmitt 2004, 1st data set	99.50	84.95	81.82	90.00	41.67	74.47
▨ Schmitt 2004, 2nd data set	98.94	67.55	72.55	84.42	45.71	65.85
▩ Schmitt, 2010	96.50	64.36	58.77	73.95	37.40	59.83

## SPANISH–ENGLISH BILINGUALS: TENSE, MOOD, ASPECT (Montrul 2008, 2009)

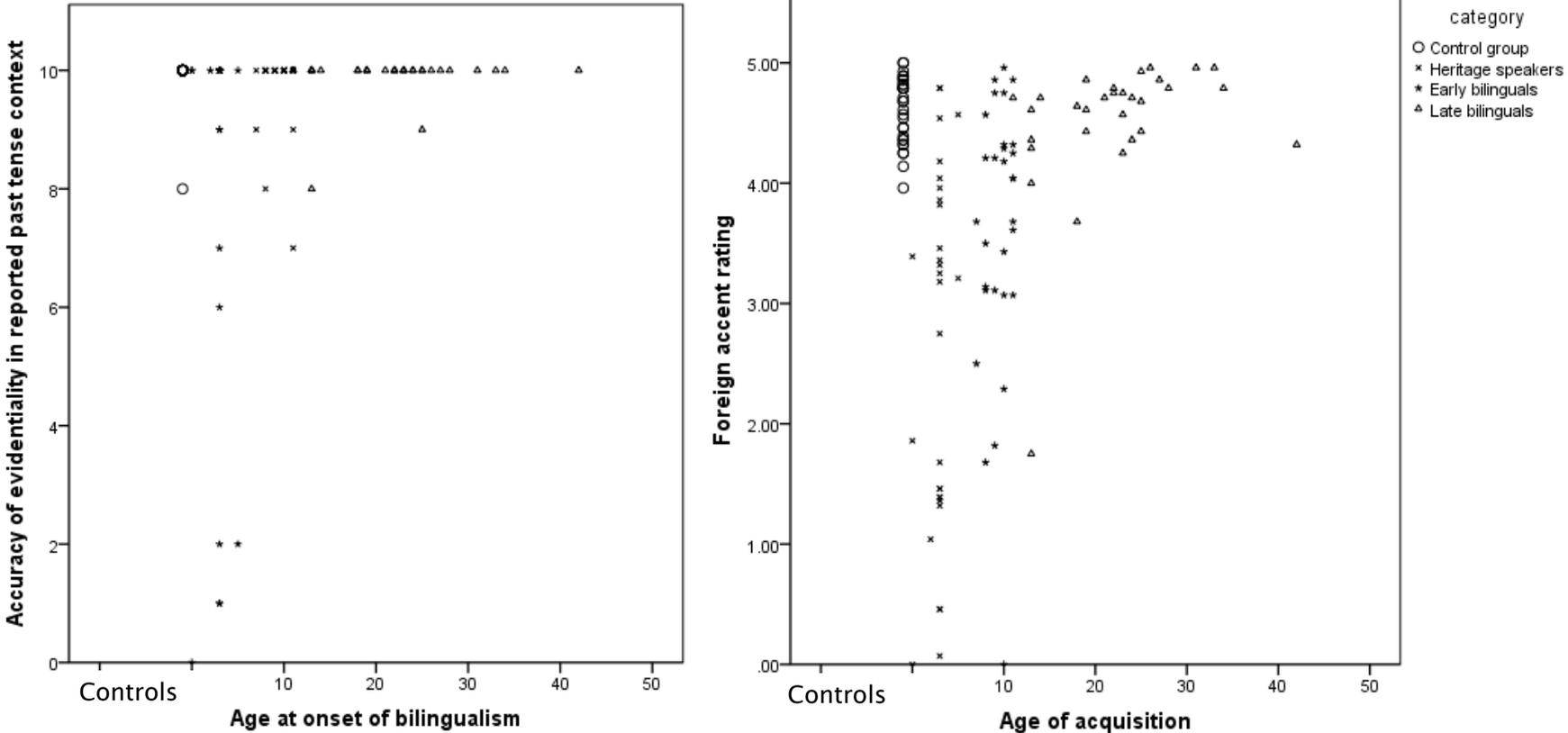
- Montrul has conducted a wide range of investigations of Spanish–English and English–Spanish bilinguals of various ages
- she investigated various aspects of morphosyntax, in particular Tense–Aspect–Mood
- her findings show that Sp–En bilinguals with younger AoAs (heritage speakers/early learners) behave like L2ers, while older attriters behave like natives
- similar findings are reported by Silva–Corvalán (1994)

## SPANISH-ENGLISH BILINGUALS: GLOBAL PROFICIENCY (Hakuta & d'Andrea 1992)

- investigated 308 Mexican-American high-school students
- self-reported proficiency, productive vocabulary, grammatical error detecting, cloze-test
- “before age 10, there is a linear drop in Spanish proficiency with decreasing age at which English was reportedly started” (p. 82), this effect levels off after that age

# EVIDENCE FOR NON-LINEAR AGE EFFECT

Tuğba Karayala's study of Turkish in the UK



# EXPLANATIONS FOR AGE EFFECT – CRITICAL PERIOD?

- ‘Critical/sensitive period’?
- Usage-Based account: entrenchment and resonance of L1
- generative accounts: phenomena at interfaces more vulnerable than core syntax phenomena, access to UG may become limited
- neurolinguistic account: crystallization hypothesis; exposure to L1 will leave long-lasting traces in the neural circuits subserving language processing

# EXPLANATIONS FOR AGE EFFECT – THE ROLE OF LITERACY

- literacy is acquired around the age where proficiency stabilizes
- some data suggest it plays a strong role for all linguistic skills, in particular grammar (Schmitt 2016)
- but: many societies/languages do not have written system, how can it have such overriding importance? (Montrul 2008)
- NOTE: Karayayla's participants are all highly literate in Turkish, were screened and matched through a C-Test!

## INTERIM CONCLUSION

- languages and linguistic features spoken dominantly until ca. age 12 are stable
- languages and linguistic features that are weakened due to dominant exposure to another language before that age are vulnerable
- is this due to erosion or to incomplete learning???

# AGE OF ACQUISITION

- the features discussed above are acquired at very different ages
  - native accent: probably quite early
  - Greek gender: early, aged 2–3 (Vasić, Chondrogianni, Marinis & Blom 2012 BUCLD)
  - Spanish Tense–Mood–Aspect: around age 3 (Montrul 2008)
  - Russian case: around age six (Polinsky 2006)
  - Turkish evidentiality: around age six (Aksu–Koç, Ögel–Balaban and Alp (2009))
- the fact that they all stabilize around age 12 strongly suggests some kind of change at that time

# THE CRITICAL PERIOD AND ATTRITION

- investigations of attrition have consistently found high levels of retention in languages that the speaker was exposed to until puberty
- this seems to be largely unrelated to external factors (e.g. amount of use)
- younger attriters show a great deal of loss even of structures/rules which they had demonstrably acquired
- is there a persistent facilitatory effect (e.g. benefits for re-learning)?

# INVESTIGATIONS OF CHILDHOOD OVERHEARERS

- studies of speakers who were briefly exposed to a language during childhood seem to suggest long-term benefits
  - Tees & Werker (1984) tested phonetic discrimination of Hindi retroflex-dental aspiration (/ʈ/ vs /t/) in English speakers with no experience, English speakers who were studying Hindi for 5 years and childhood overhearers. Their findings suggest long-term benefits of early exposure
  - Au, Knightly, Jun & Oh 2002; Oh, Jun, Knightly & Au 2003: childhood overhearers of Korean later develop a more nativelike accent and are better at phonetic discrimination than late learners who begin at the same age
  - Au, Oh, Knightly, Jun & Romo 2008 find the same effect for Spanish pronunciation (but not grammar)

# HYPNOSIS

- three case studies using hypnosis on childhood overhearers
  - As (1963): young man born in Sweden to Swedish parents. When he was five, his mother divorced his father and married an American. He was instructed not to use Swedish, as his stepfather could not understand it. Hypnotised age 18, was able to understand simple sentences that he could not understand out of hypnosis
  - Fromm (1973): son of Japanese parents, was interned during WWII, very traumatic experiences. Underwent therapy and age-regression at age 26. When he was age-regressed to age 3, he spoke Japanese (this was tape-recorded and confirmed)
  - Footnick (2007): Togolese-French young man whose mother had been told by his teachers to use only French with him. Under hypnosis, he was able to understand and produce Mina (variety of Ewe). He retained this knowledge after the hypnosis sessions

# INVESTIGATIONS OF CHILDHOOD OVERHEARERS

- studies of speakers who were briefly exposed to a language during childhood seem to suggest long-term benefits
- hypnosis studies also suggest retention and a very deep level which the speaker is unaware of
- Problem: to what extent can it be demonstrated that exposure had really ceased totally?

# THE ADOPTION PERSPECTIVE

- international adoptees experience an otherwise unprecedented break in linguistic tradition, exposure and use
- they typically switch languages very fast (months) and retain little to no trace of birth language
- case studies have confirmed this (Isurin 2000, Nicoladis & Grabois, 2002)

# STUDIES OF INTERNATIONAL ADOPTEES

- Pallier et al. 2003, Ventureyra, Pallier & Yoo 2005:
  - investigation of Korean adoptees in France ( $n \approx 8$ , varies in different publications)
  - age of adoption  $\approx 3-10$ , mean  $\approx 6.7$  (varies in different publications)
  - tasks: recognise whether familiar sequences (numbers 1–10, days of the week etc.) heard in a number of languages are Korean or not, recognise translation equivalents of familiar words
  - the adoptees did no better on any of these tasks than French speakers who had never been exposed to Korean
  - fMRI also revealed no activation when Korean was heard

# STUDIES OF INTERNATIONAL ADOPTEES

- Hyltenstam, Bylund, Abrahamsson & Park (2009):
  - investigation of 21 Korean adoptees in Sweden, studying Korean at a Swedish university
  - age of adoption  $\approx$  0.5–10, mostly before age 2
  - comparison with 11 Swedes studying Korean
  - older adoptees have advantage in phonetic discrimination over natives Swedes, none of them have advantage on grammatical tasks

# STUDIES OF INTERNATIONAL ADOPTEES

- Oh, Au & Jun (2010):
  - investigation of 12 Korean adoptees to the US, beginning learners of Korean at US university
  - age of adoption < 1
  - comparison with 13 US–American beginning learners of Korean at same university
  - adoptees have an advantage at identifying some Korean phonemes

# STUDIES OF INTERNATIONAL ADOPTEES

- Chinese tones (Pierce, Klein, Chen, Delcenserie & Genesee 2014):
  - investigation of 21 Chinese adoptees in Montreal
  - age of adoption 6–25 months, age at testing 9–17 years
  - comparison with French monolinguals and French–Chinese bilinguals
  - listen to nonword syllables with tones (as opposed to non-linguistic hummed tones)
  - adoptees recruit brain areas where tonal processing typically takes place, similarly to Chinese–French bilinguals, French monolinguals recruit different brain area in right hemisphere

# STUDIES OF INTERNATIONAL ADOPTEES

- Chinese tones (Zhou, forthc.; Zhou & Broersma 2014):
  - Chinese adoptees in the Netherlands (considerably younger than the Canadian adoptees)
  - better at producing tones than Dutch monolinguals
  - no better at perceiving/discriminating them, not even after training

## GERMAN-JEWISH REFUGEES

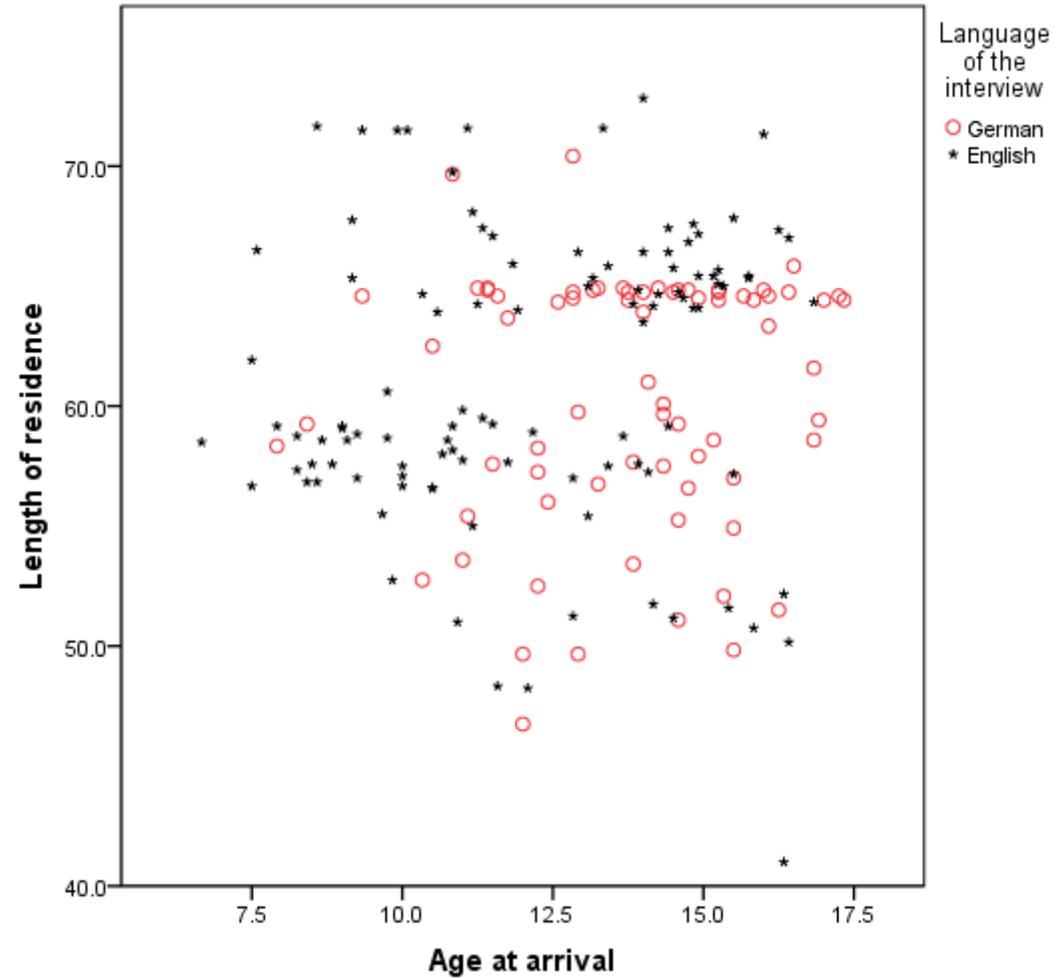
- between Nov. 1938 and Aug. 1939, 10,000 German-Jewish children (2 - 17 years old) were brought from Germany by international organisations and placed with English-speaking foster families (Kindertransporte)
- in the same time period, an unreported number of children escaped with their families under otherwise very similar circumstances (family migrants)

# KINDERTRANSPORT–SURVIVORS AND L1 ATTRITION

- “That fall [of 1939, MSS] I begin to forget my German. This is in part because my German is being replaced by English, which I now speak without having to think about it. But there may have been an almost willed though unconscious element in my assiduous forgetting of the first language I spoke and wrote and read.” (Milton, 2005: 11)
- “Six weeks later I wrote to my parents in English ‘I no longer speak German.’ I never have, and I’ve never been able to relearn it.” (Kurt Fuchel, quoted from the documentary film *Into the Arms of Strangers*)

# RECRUITMENT ISSUES

- finding participants in this age range is extremely difficult



# STABILIZATION OF THE L1

- Pallier's adoptees, even with AoAs around 9 years, were unable to even recognise familiar words in Korean
- the Kindertransport migrants of AoA  $> 11$  were able to talk at length about their lives, despite some grammatical/lexical problems and/or a foreign accent
- it is extremely difficult to find German language interviews with Jewish migrants from both categories with AoAs  $< 11$  (English language interviews are easy to find)
- this suggests that AoA plays a dramatic role for retention, even in situations where there is little to no further contact

## CONCLUSION

- the stability of the L1 fluctuates greatly for speakers who become bilingual in childhood
- the period between 6 and 12 plays a crucial role for consolidation and entrenchment
- heritage language proficiency, incomplete acquisition and attrition are not qualitatively distinctive phenomena
- we need to take a broad view of the entire continuum to fully understand what is going on

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