

Turkey Freudian Slips

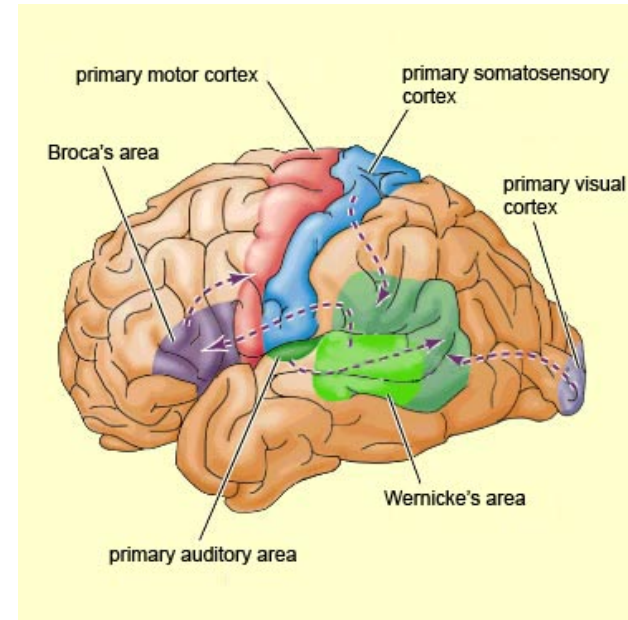
Language 2

Psyc 364: Week 12

Shelagh Freedman

The Aphasias: Difficulties with Language

- Broca's aphasia – language production deficit
- Wernicke's aphasia – language comprehension deficit
- Conduction aphasia –
can't repeat (arcuate fasciculus)
- Anomia – disruption of word
finding (left H; left temporal)



Broca's aphasia:

- <https://www.youtube.com/watch?v=gocIUW3E-go>

Wernicke's aphasia:

- <https://www.youtube.com/watch?v=dKTdMV6cOZw>

For your interest (to go 35:20 in the first video to see verb generation in the brain in real time):

- <https://www.youtube.com/watch?v=ly2yOMqjnC4&t=2155s>
- <https://www.youtube.com/watch?v=nVEoSJlBmmk&t=53s>

Slips of the Tongue

- Dysfluencies in speech are slips-of-the-tongue
 - Spoonerisms (reversals of speech sounds)

Fill the gas up with car

He pulled a pantrum

A well-boiled icicle

Go shake a tower

Runny Babbit: A Billy Sook

To explain clarefully

Why do we make serial order errors in speech?

- Dell, Burger, & Svec (1997)
- Connectionist model
 - Phonemic nodes
 - Activation and inhibition
 - More anticipatory errors with practice

He drank the cuff of coffee
- Four-word phrases to repeat along with fast or slow metronome
 - Simple slender silver slippers*
 - Pam's plain plaid pan*
 - Fine fresh free fish*
 - Chef's sooty shoe soles*
- Self-inhibition mechanism proposed to prevent perseverations (repetitions of previous phonemes)

Speech Production Requires Working Memory Capacity



- Kemper et al. (2009)
- Q: what aspect of speech production are affected by cognitive load?
- Pursuit rotor task plus speech production task
- Motor performance: time on target
- Elicitation of speech
Describe someone you admire and why
- All speech output transcribed and analyzed
 - Mean length of utterance
 - Propositional density
 - Speech rate
 - Grammatical complexity (# clauses, developmental level)
- Almost all measures showed dual-task costs





Writing

- Raulerson et al. (2010)
- Q: are there differential contributions of WM during written language production?
- Employed concurrent task technique
- Participants wrote definitions of nouns (concrete or abstract; high or low frequency)
- Visual WM task: pictures of objects – change detection task
- Verbal WM task: saw 2 syllables /ba/ /da/ for change task
- Found slowed RTs for verbal, not visual WM task when paired with writing task
- Definition quality was unaffected by dual tasking, suggesting that writing was prioritized regardless of concreteness or word frequency

Writing in Action

- Maggio et al. (2012)
- Q: what are the dynamic processes at work during writing?
- Look at temporal characteristics (pauses, fluency) as a function of the linguistic properties of words (e.g., word length, syllable frequency)
- Participants: French monolingual students aged 10-15 yrs
- Watch short silent video then compose narrative text using a digital tablet and stylus
- DV: Before, during, and after word pause duration
- Found that pauses were linked to the characteristics of the current and next word
- Concluded that the processes used to write (lexical access, orthographic / motor) occur during writing of the current word and preprocessing / planning of word $n+1$ happens when word n is being written

Bilingualism Background

- MORE THAN HALF of the world's population is at least somewhat BILINGUAL (Schwartz & Kroll, 2006)
- Coordination of cognitive skills with SOCIAL aspects of communication
 - Multi-ethnic origins
 - Use of different languages for education/business

Advantages of Bilingualism

- In early 1900' s attitude toward Bilingual education not favourable
 - Bilingualism produced “cognitive deficits” b/c the brain must store two cognitive systems
- In 1960' s discovered that bilinguals scored higher than monolinguals on different tasks after correcting for confounding factors such as immigrant or socio-economic status

Advantages of Bilingualism

1) Bilinguals actually acquire more expertise in their L1 (native language).

-Eg. English-speaking Canadians who learn in Fr. Gain greater understanding of English language structure (Lambert et al., 1991)



Advantages of Bilingualism

2) Bilinguals are more aware that names assigned to concepts are **ARBITRARY**

-Increased **METALINGUISTIC** awareness

-knowledge about the **FORM** and **STRUCTURE** of a language

Advantages of Bilingualism

3) Bilinguals excel at paying **SELECTIVE ATTENTION** to subtle aspects of language tasks and ignoring more obvious characteristics-e.g. grammaticality.

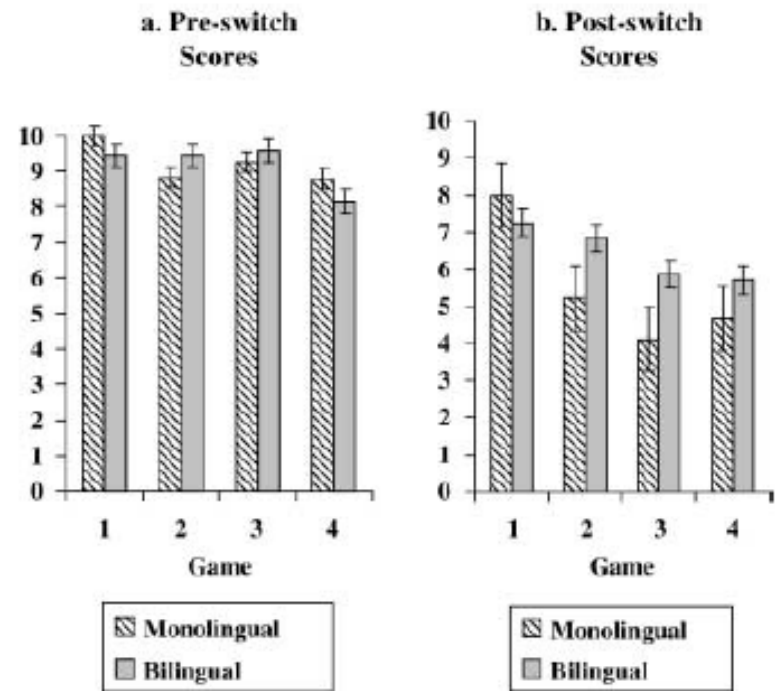
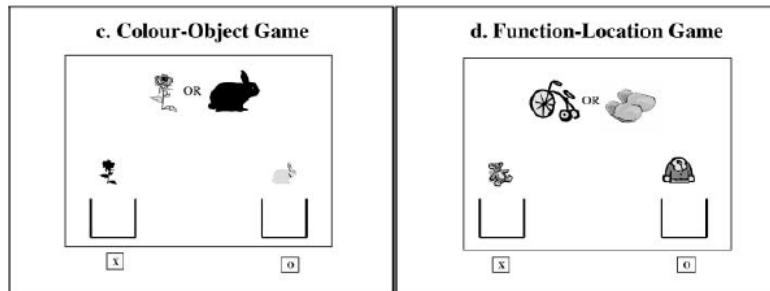
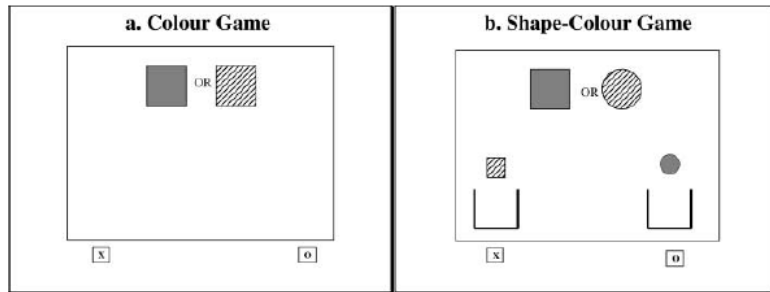
- Bialystok & Majunder (1998)

“THE DOG MEOWS”

- To correctly answer, one needs to inhibit the semantic influences and focus just on grammatical structure

Advantages of Bilingualism

4) Bilingual children better at following complicated instructions when they change (Bialystok & Martin, 2004)



Advantages of Bilingualism

- 5) Bilinguals perform better on concept-formation tasks and some tests of NON-VERBAL intelligence
 - Visual pattern tasks (Pearl & Lambert, 1962)
 - Problem solving tasks requiring them to ignore irrelevant information (Bialystok, 2001)

Advantages of Bilingualism

6)

Bilingual children better than monolinguals on some CREATIVITY (divergent thinking) tests

7) Bilingual children more sensitive to PRAGMATIC aspects of language (Comeau & Genesee, 2001)

8) Being bilingual may EVEN protect the brain against cognitive decline!

Can bilingualism delay dementia onset?

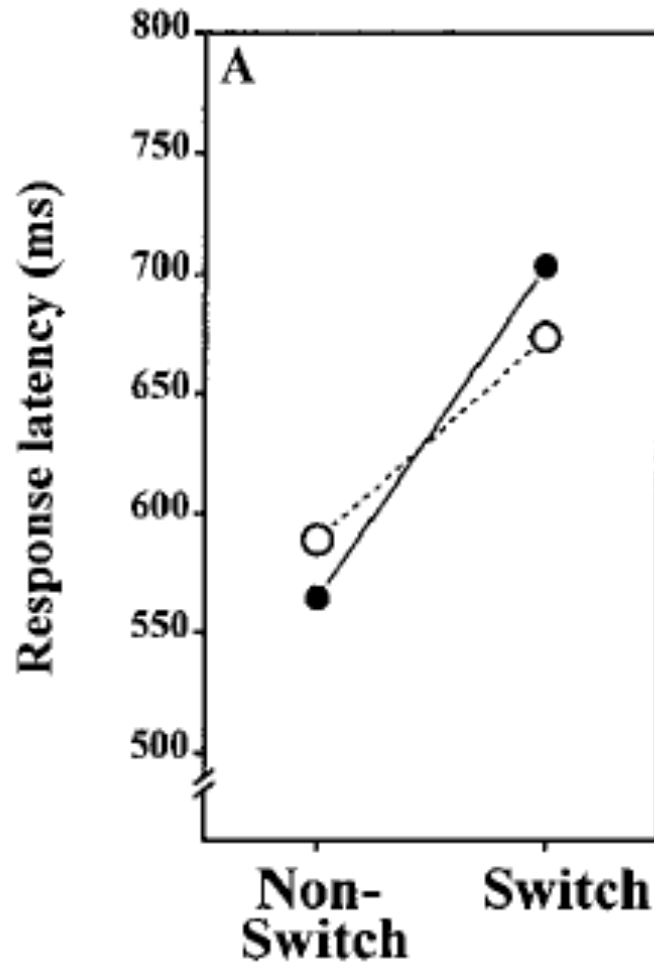


- Bialystok et al. (2014)
- Lifelong use of two or more languages builds up cognitive reserve
- Bilingual patients with AD diagnosis had more brain atrophy (CT scans) and were older than monolingual patients
- Suggests bilingual language experience enabled higher levels of functioning given the observed atrophy
- Q: despite delayed diagnosis, do bilinguals show a more rapid rate of decline?
- Patients recruited from Baycrest Hospital memory clinic either MCI or probable AD, roughly half Bilingual vs. monolingual
- Replicated age difference (older bilinguals at diagnosis) after controlling for a variety of lifestyle factors
- Tests of executive function (Stroop, switching) were the same between language groups DESPITE older age of bilinguals
- Once diagnosed, repeated testing showed similar rates of decline for bilinguals and monolinguals
- Delayed diagnosis of roughly 5 years of good quality of life

What processes get more “exercise” in bilinguals?

- Green’s inhibitory hypothesis
 - Lexicons for L1 and L2 are both activated during language production
 - using L1 requires inhibition of L2, and even more so in the opposite direction
- Meuter and Allport (1999)
- Q: what processes are required to switch between L1 and L2?
- Numeral naming task with colour cues indicated which language to use (En/Fr)

What processes get more “exercise” in bilinguals?



- Meuter and Allport (1999)
- L1 (dark circles) L2 (open circles)
- Nonswitch trials show superior lexical access of L1
- Switch trials show slow-down of returning to L1 immediately after naming in L2
- Conclusion: The slow-down on switch trials indicates inhibition of L1 lexicon during L2 naming, that has residual effects when returning to L1
- Bilinguals get “exercise” in switching processes important for attentional control

So it seems that being Bilingual is great...

- For social/communicative reasons and COGNITIVE advantages listed
- Very few disadvantages:
 - Slower processing speed, possibly due to need to inhibit other language

BUT:

- What affects our ability to learn an L2?
 - Age of acquisition
 - Individual differences (phonological awareness and WM skills)

Age of Acquisition

The age at which you learn an L2 affects how fluent you will become in that language

EARLIER IS BETTER

CRITICAL PERIOD
HYPOTHESIS



Roots of Bilingualism

- Byers-Heinlein et al. (2010)
- Newborn infants (0-5 days) who heard English only or Tagalog and English equally were tested for language preference shortly after birth
- Preferential sucking (mean sucking frequency during Tagalog vs. English speech)
- Chinese is more rhythmically distinguishable from English than Tagalog, therefore more balanced preference for Tagalog vs. English even though they had never heard Tagalog before

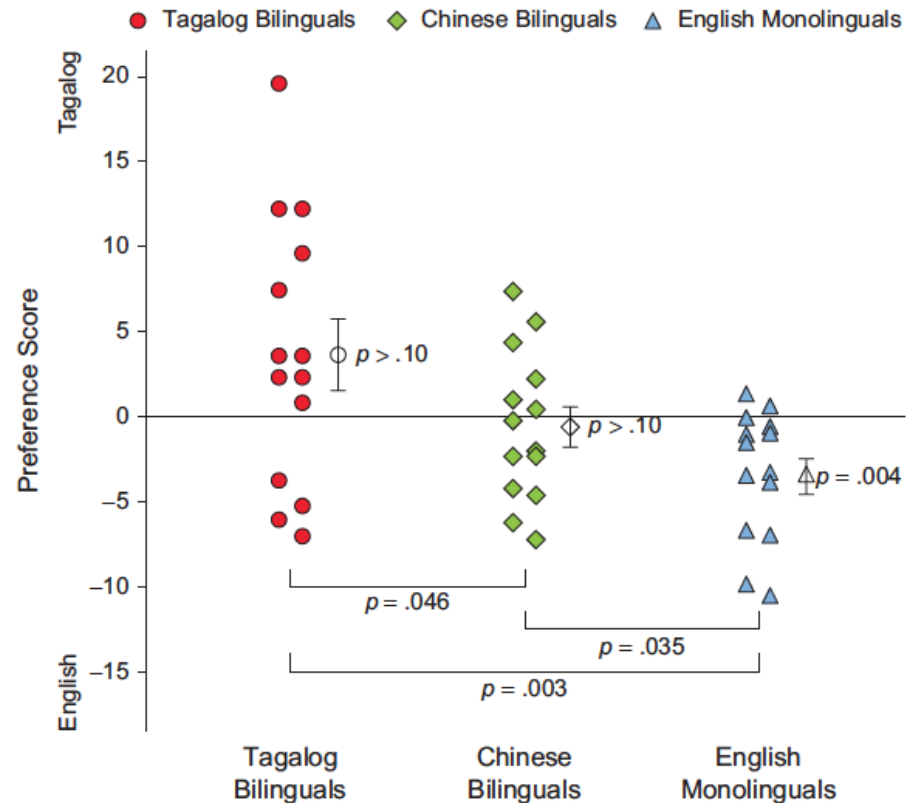


Fig. 2. Individual preference scores (colored symbols) and group means (open symbols) for monolingual English, Chinese-English bilingual, and Tagalog-English bilingual infants in Studies 1a and 1b. Preference scores were calculated by subtracting the average number of high-amplitude sucks produced during English minutes from the average number of high-amplitude sucks produced during Tagalog minutes. Significance values for between-group comparisons are shown with brackets; significance values adjacent to group means are for comparisons to zero. Error bars represent standard errors of the mean.

Critical Period Hypothesis

- This theory states that:
- Ability to acquire an L2 with native-like fluency is limited to a specific period of your life
- After this time, you will no longer be able to be completely FLUENT in the L2
 - Phonology (accentless speech?)
 - Idioms of the L2



Phonology and Age of L2 Acquisition

- Sounds of a person's speech are affected
- L2 learned in adulthood more likely to have a foreign sounding accent (McKay et al., 2006)
- Koreans arriving in U.S. during childhood have minimal accents vs. those that arrived as adolescents or adults

Vocabulary and Age of L2 Acquisition

- Age of acquisition NOT related to overall VOCABULARY learning
- But certain structures in an L2 such as IDIOMS less present dependent on age of acquisition
- Overall however, we continue to learn new words throughout our lifespan

Grammar and Age of L2 Acquisition

- Most controversial area in the literature
 - Difficulty separating formal education effects in L2
 - When you control for overall educational level you find few differences
 - If the two languages are VERY different, there may exist some difficulty

Interpreting in an L2

- Translating from a spoken message in one language to another language is extremely complex!!!
 - Think about the cognitive skills involved:
 - Attention
 - Working memory
- You need to be able to:
 - Understand/decode
 - Mentally transform
 - Actually articulate (speak) something which occurred earlier

Interpreting in L2

Cristoffels et al. (2006)

- Bilingual students
- Dutch teachers proficient at English
- Interpreters

- Q: does interpretation expertise confer advantages to cognitive processing beyond being bilingual?
- On tests of working memory, YES!

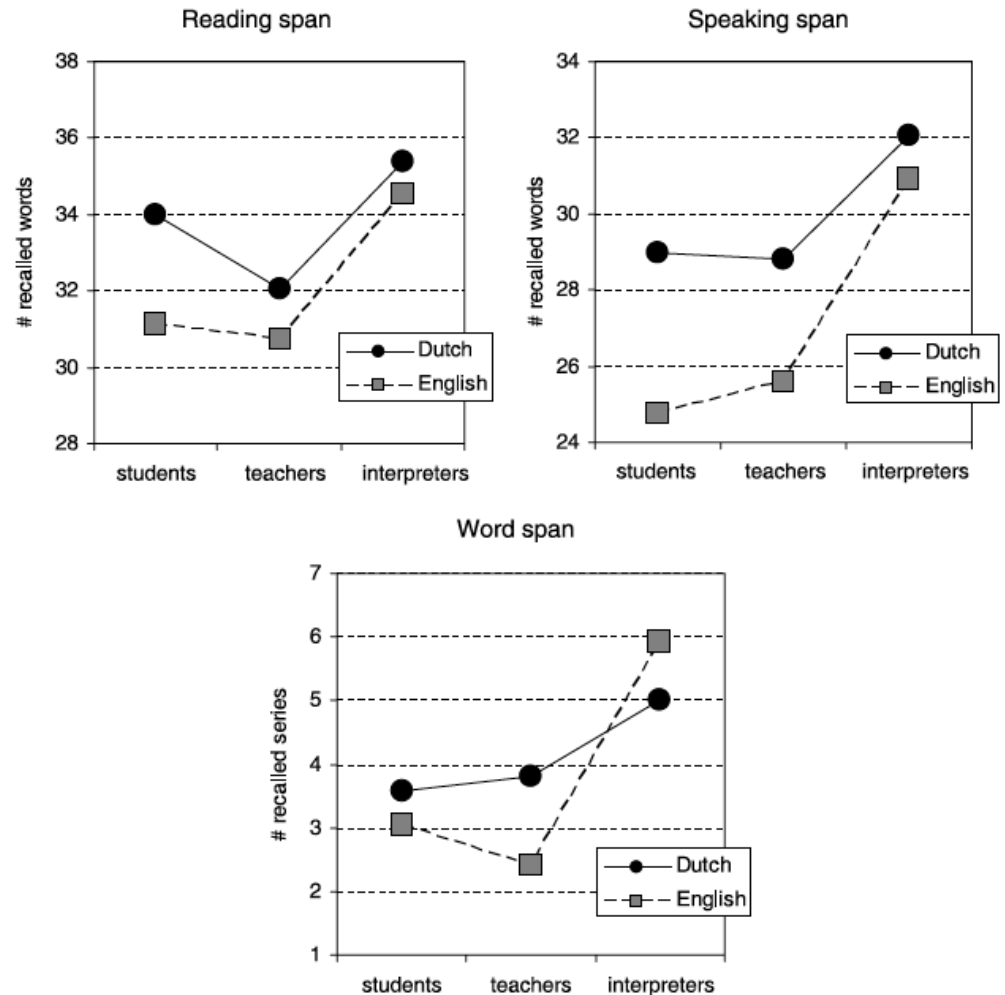


Fig. 2. Average scores on the reading span, speaking span, and word span tasks per group.

Interpreting in an L2

Cristoffels et al. (2006)

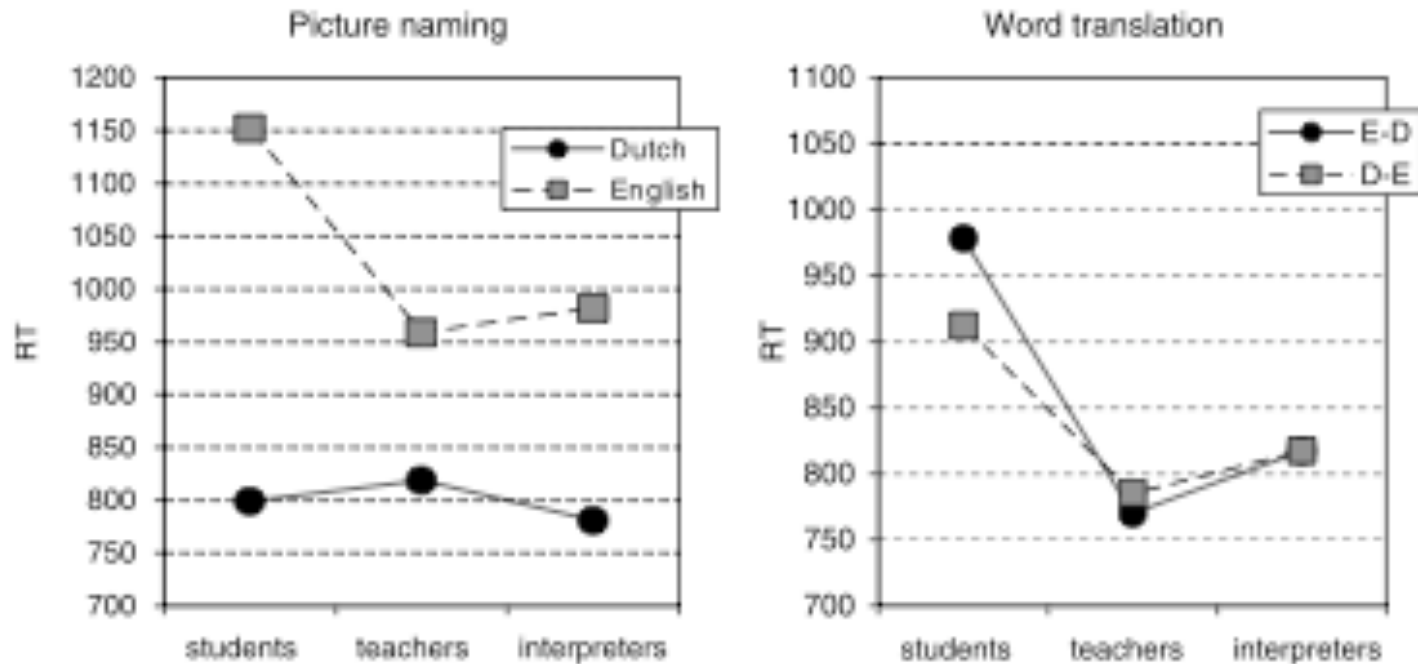


Fig. 1. Average reaction times on the picture naming and word translation tasks per group.

Final Comments on Bilingualism

- Careful to acknowledge selective benefits
- Difficulty to characterize degree of bilingual experience (formal education, simultaneous or compartmentalized, serial?)
- Few disadvantages in the long run; many potential advantages