Language Development in Internationally-Adopted Children from China:
A Special Case of Early Second Language Acquisition?

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Why study IA children?

IA children from China begin acquisition of L2 after 12- 24 months of age and acquisition of L1 is abruptly and completely stopped

- normal neuro-cognitive substrates for L2 learning may be altered significantly

- acquisition of adopted language may be like L1 acquisition, but with delay ("second first language acquisition")

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Questions

1) Is acquisition of adopted language like L1 or L2 acquisition?

2) Do IA children achieve same levels of competence as non-adopted children, or do they show early age effects?

3) Why are there early age effects?

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At-Risk:

Adopted children may be at-risk because:

1) pre-adoption environment may be impoverished socially, cognitively, and linguistically (Zeahan, et al., 2004)

2) they discontinue acquisition of birth language

   Does this weaken neuro-cognitive substrates for later language learning? (Mayberry, 2007; Johnson & Newport, 1989)

3) delayed onset of "second language" ⇒

   very early "critical period" (Hyltenstam & Abrahamsson, 2009)

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BUT, many advantages:

- exposed to L2 only

- enriched learning environment: elevated parental education and socio-economic background (Tan & Yang, 2005; Hart & Risley, 1995)

- adopted children from China are mainly girls

- within classical critical period

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Language Outcomes

- IA children from China:

  - rapid progress in new language (e.g., Pollack, 2005)
  - often score within the normal range, or higher, on standardized tests in English (Scott et al., 2005)
  - correlated with amount of exposure to language and/or age of adoption (Gauthier & Genesee, Scott, et al., 2008)
  - appear to follow same trajectory (Pierce & Genesee, 2012; Snedeker et al., 2007), but few studies and little detail
  - considerable variability in outcomes (Gauthier & Genesee, 2011)
  - high rate of referrals to SLPs (Scott et al., 2008)

    ⇒ they are not at-risk for "normal" language outcomes

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Previous Studies

* examined if, and when, IA children achieve linguistic parity with native speakers of the adoption language (English in most cases)

* many studies used indirect measures of language abilities (parent reports and surveys) or standardized tests (norms) - appropriate for their «normative» goals

* did not take into account enriched language learning environment (SES) and gender of IA children from China -- factors that can influence language development favorably

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Gauthier & Genesee
(2011, CHILD DEVELOPMENT)

* direct comparison between IA and CTL children controlling for **SES,** age, gender

* 24 IA children from China (age at adoption: 7 to 24 mths)
  Time 1: between 41.5 – 56 months of age
  Time 2: between 56.5 – 72 months of age

Results
* lags in comparison to CTL children on:
  * expressive vocabulary
  * expressive and receptive language
  * sentence recall

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Results

Tests		Results	Norms
Clinical Evaluation of Language Fundamentals (CELF): Recalling Sentences subtest	CELF	IA < CTL	Within
CELF: Expressive language index	CELF	IA < CTL	Within
CELF: Receptive language index	CELF	IA < CTL	Within
Expressive One-Word Picture Vocabulary Test	EOWPVT	IA < CTL	Within

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Delcenserie, Genesee, & Gauthier
(in press, Applied Psycholinguistics)

* Does enriched language environment of schooling close the gap?

* Do lags exhibited by IA children persist with more exposure to adopted language?

  * If the lags resolve → amount of exposure would explain previous differences

  * If the lags persist → other factors are at play

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The Children

* 27 IA girls from China

* 12 previously assessed by Gauthier and Genesee

* 15 new IA children
  * increased the sample size
  * do results generalized to a new group of IA children?

* Age at adoption: 7 - 21 mths of age
* Age at testing: 9 – 12.4 (grades 4 to 7)

* Length of exposure to French: 80.6 mths (*SD* = 7.4 months)

* IA children were matched with 27 CTL children for age, gender, parental level of education, and family income

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Results: All

Tests	Assesses	GRP-COMPARISONS	NORMS
CBCL	Socio-Emotional Abilities	IA = CTL	within
EVIP	Receptive Vocabulary	IA = CTL	within
WIAT	Reading Comprehension	IA = CTL	within
CELF	Word Association	IA = CTL	within
ECOSSE	Receptive Grammar	IA < CTL **	within
WISC	Word Definitions	IA < CTL **	within
EOWPVT	Expressive Vocabulary	IA < CTL **	within
CELF	Recalling Sentences (verbal memory)	IA < CTL **	below

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Distribution of IA Scores Relative to Control Children

TEST	Below 2 SD	[-1 and -2]	[-1 and 1]	[1 and 2]	Above 2 SD
Expressive VOC	18.2%	31.8%	36.3%	13.6%	
Receptive VOC		22.2%	66.6%	11.1%	
Reading		11.1%	88.9%		
Recalling Sentences	29.6%	37%	29.6%	3.7%	
Word Association	7.4%	25.9%	48.1%	18.5%	
Receptive Grammar	22.2%	25.9%	48.1%	3.7%	
Word Definitions	22.2%	29.6%	40.7%	3.7%	3.7%

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Explaining IA Children's Language Results?

* **Pre-adoption adversity**:
  * Improbable because cognitive and socio-emotional abilities are similar to those of non-adopted children

* **Exposure**: 80.6 months of exclusive exposure to French
  * Enough for IA children to achieve performances on measures of language abilities within test norms (age-appropriate)

* **Schooling**: enriched language environment of school
  The linguistic environment of schooling did not close the gap

* **L1 Attrition: ?**

* **Verbal memory: ?**

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Results: Sentence Recall

a) CORRELATIONS:

* performance on Recalling Sentences was significantly correlated with scores on ALL language tests for IA children

b) MANCOVA: to remove influence of verbal memory:

* IA = CTL children on expressive vocabulary, receptive grammar, and word definitions

  ⇒ Are differences in language between groups due to differences in verbal memory?

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VERBAL MEMORY & LANGUAGE LEARNING

* verbal memory (especially phonological STM) is a significant correlate of language outcomes:

  * L1 vocabulary: Gathercole & Baddeley, 1989; Hoff, Core & Bridges, 2008

  * L1 grammar: Adams & Gathercole, 2000, 2005, 2006; Chiat & Roy, 2008

  * L2 vocabulary: Juffs & Harrington, 2011; Service, 1992

  * L2 grammar: French & O'Brien, 2008; Parra, Hoff & Core, 2008

  * children with SLI: Gathercole (2006)

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Delcenserie & Genesee: The Children

* 30 IA girls from China; 18 previously assessed by Gauthier & Genesee and 20 previously assessed by Delcenserie et al.

* Age at adoption: M= 12.9 mths (range: 6 - 24 mths)
* Age at testing: M=10;8 yrs

* Length of exposure to French: 9;7 yrs; SD = 7.4 mths

* 30 CTL children matched for age, gender, parental level of education, and family income

* children were in grades 4- 6
* none had repeated a grade

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Results: Cognitive & Language

Asseses	Tests	GRP-COMPARISONS (within/below norms)
Cognitive Abilities	Matrice (fluid reasoning)	IA = CTL
	Coding (speed of processing)	IA = CTL
	Non-verbal IQ	IA = CTL
Language Abilities	Expressive Vocabulary	IA < CTL *** (within)
	Receptive Vocabulary	IA < CTL *** (within)
	Receptive Grammar	IA < CTL *** (below)
	Concepts and Following Directions	IA < CTL *** (below)
	Word Associations	IA < CTL *** (within_

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Results: Memory

Asseses	Tests	GRP-COMPARISONS
Verbal Memory Abilities	**Phonological short-term memory: Forward Digit Recall**	IA < CTL *** (within)
	Phonological short-term memory: Nonword Repetition	IA < CTL *** (within)
	Phonological short-term memory: Recalling Sentences	IA < CTL *** (below)
	Verbal working memory: Backward Digit Recall	IA < CTL *** (within)
	Competing Language Processing	IA < CTL *** (within)
Non- verbal Memory Abilities	Spatial Span Forward	IA = CTL
	Spatial Span Backward	IA = CTL

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Memory-Adjusted Standard Scores of Language Test Results

	Phonological Short Term Memory			Verbal Working Memory		
	M	t 29	p	M	t 29	p
Expressive Vocabulary	130.30	8.79	< .001	112.23	2.82	.01
Receptive Vocabulary	143.93	16.54	< .001	130.17	9.32	< .001
Concepts and Following Directions	12.50	4.29	< .001	9.27	-1.02	.32
Word Associations	15.70	11.28	< .001	12.90	3.39	.002

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Predicting Language Outcomes

* **IA CHILDREN:**
  * stm ⇨ expressive vocabulary (p.02)
  * stm ⇨ receptive vocabulary (p. .02)
  * stm ⇨ expressive language (p. .02)
  * wm ⇨ receptive language (p. .03)

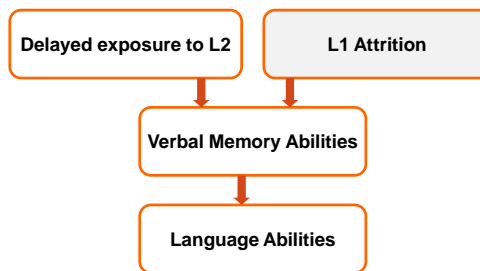* **CTL CHILDREN:**
  * exposure + wm ⇨ expressive vocabulary (p.= .01)
  * exposure ⇨ receptive vocabulary (.01)
  * exposure expressive language (p. = .03)
  * no predictors of receptive language

stm=short term memory; wm=working memory

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Hypothesis

Delayed exposure to L2	L1 Attrition

Verbal Memory Abilities

Language Abilities

* **Interesting possibility… but more research is needed**

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Canada

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RESULTS: Percentage of IA Children Above and Below the Mean for Non-Adopted Children

Asseses	Tests	[-2]	[-2, -1]	[-1, 0]	[0,+1]	[+1, +2]	[+2]
Language Abilities	Expressive Vocabulary	86.7%	10.0%	3.3%			
	Receptive Vocabulary	56.7%	33.3%	10.0%			
	Receptive Grammar	96.7%	3.3%				
	Concepts and Following Directions	93.3%	6.6%				
	Word Associations	16.7%	43.3%	23.3%	16.7%		

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RESULTS: (cont.)

Asseses	Tests	[-2]	[-2, -1]	[-1, 0]	[0,+1]	[+1, +2]	[+2]
Verbal Memory Abilities	**Phonological short-term memory: Forward Digit Recall**	43.3%	50.0%	6.6%			
	Phonological short-term memory: Nonword Repetition	56.7%	10.0%	16.7%	13.3%	3.3%	
	Phonological short-term memory: Recalling Sentences	52.3%	36.7%	6.6%	3.3%		
	Verbal working memory: Backward Digit Recall	60.0%	20.0%	10.0%	10.0%		
	Competing Language Processing	76.7%	10.0%	6.6%	6.6%		
Non-verbal Memory Abilities	Spatial Span Forward	3.3%	26.7%	20.0%	30.0%	3.3%	16.7%
	Spatial Span Backward		30.0%	20.0%	33.3%	13.3%	3.3%

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