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L3 Grammati Gender

Acquisitio

Models of L Acquisition

Procedures

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"Beginners"
vs. L3 Initia

State

Procedures

Key Finding

L3 Phonolog

Background

Procedures

Results

Key Findin

Summar

Issues in Third Language Acquistion and Development

Megan M. Brown

Boston University

Linguistic Theory and Second and Third Language Acquisition in Children and Adults

MIT Linguistics Department, March 28th, 2022





Outline

Megan M. Brown

- 1 L3 Grammatical Gender Acquisition
- 2 L3 "Beginners" vs. L3 Initial State
- 3 L3 Phonology
- 4 Summary

L3 Grammatica Gender

Models of L3

Acquisition Procedures

Results

Key Findin

"Beginn

vs. L3 Initia

Background

Procedures

Key Findings

L3 Phonology

Backgroun

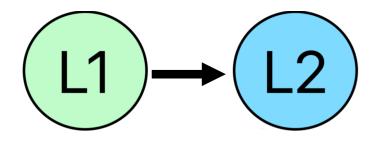
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Results

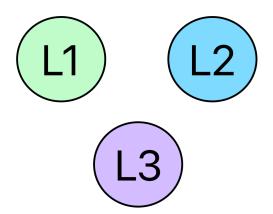
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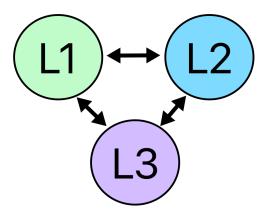


Models of L3 Acquisition

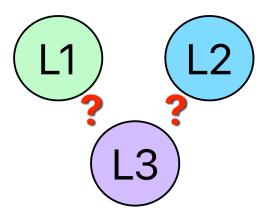
Key Findings



Models of L3 Acquisition



Models of L3 Acquisition



Models of L3 Initial Transfer

Whole-Transfer Models

Piecemeal-Transfer Models

L1 Transfer Hermas, 2010

L2 Status Factor Bardel & Falk, 2007

Typological Primacy Rothman, 2010

Language of Community Fallah et al. 2016

Cumulative Enhancement

Flynn et al., 2004

Linguistic Proximity Westergaard et al., 2017

> Scalpel Model Slabakova, 2017

Models of L3 Acquisition

Wholesale Transfer Models

I 1 Transfer

L2 Status Factor Model

Typological Primacy Model

Language of Community

Development

Megan M. Brown

L3 Grammati

Acquisitio

Models of L3 Acquisition

Procedures

Results

Key Finding

"Beginners" vs. L3 Initial

State

Procedures

Results

L3 Phonology

Rackgroup

Backgroun

Particip

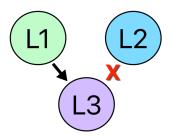
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Summary

The L1 Transfer Proposal Hermas (2010)

L1 grammar serves the initial state for **all** new languages.



Gender Acquisitio

Models of L3 Acquisition

Procedures

Results

Key Finding

"Beginners" vs. L3 Initia

Backgroup

Procedures

Key Finding

L3 Phonolog

Background

Procedures

Particip

Kesults

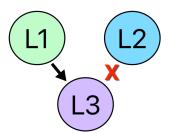
Key Finding

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The L1 Transfer Proposal Hermas (2010)

L1 grammar serves the initial state for **all** new languages.

TLA is the same process as SLA



Results

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"Beginners"
vs. L3 Initia

Backgrou

Procedures

Key Finding

L3 Phone

Background

Particip

Results

Key Finding

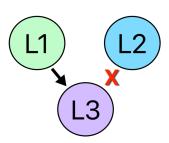
Summar

The L1 Transfer Proposal Hermas (2010)

L1 grammar serves the initial state for **all** new languages.

TLA is the same process as SLA

Transfer can be facilitative or non-facilitative.



L3 Grammatic Gender

Acquisitio

Models of L3 Acquisition

Results

Key Finding

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"Beginners" vs. L3 Initial

State

Procedures

Results

L3 Phonology

Backgroup

Dackgrouin

Particip

Results

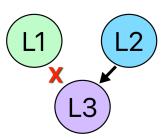
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Summary

L2 Status Factor Model

Bardel & Falk (2007)

L2 and L3 are neurologically more similar



L3 Grammatic Gender

Acquisitio

Models of L3 Acquisition

Procedures

V ... Finding

Key Finding

"Beginners" vs. L3 Initial

State

Procedures

Kesults

L3 Phonology

Rackeroun

Duckground

Particip

Results

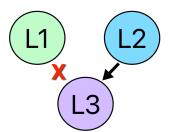
Summary

L2 Status Factor Model

Bardel & Falk (2007)

L2 and L3 are neurologically more similar

Exclusive L2 Transfer



Acquisition

Results

Key Finding

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"Beginners" vs. L3 Initia

State

Procedures

Kesuits

Background

Background

Particip

Results

Key Finding

Summary

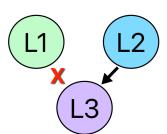
L2 Status Factor Model

Bardel & Falk (2007)

L2 and L3 are neurologically more similar

Exclusive L2 Transfer

Transfer can be facilitative or non-facilitative.



Gender Acquisitio

Models of L3 Acquisition

Procedures

Key Finding

Key Finding

"Beginners" vs. L3 Initial

State

Procedures

Key Finding

L3 Phonology

Background

Duckground

Particip

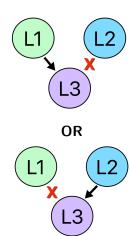
Results

Key Finding

Summary

Typological Primacy Model Rothman (2010)

The most **typologically similar** language transfers



Grammati Gender Acquisition

Models of L3 Acquisition

Procedures

Key Finding

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"Beginners"
vs. L3 Initia

State

Procedures

Key Finding

L3 Phonology

Background

Procedures

Results

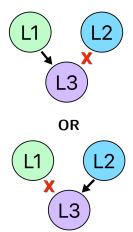
Key Finding

Summan

Typological Primacy Model Rothman (2010)

The most **typologically similar** language transfers

Lexicon



Grammation Gender Acquisition

Models of L3 Acquisition

Results

Key Finding

L3
"Beginners"
vs. L3 Initia

State

Procedures

Kesults Key Finding

L3 Phonolog

Background

Procedures
Participants

Results

Key Finding

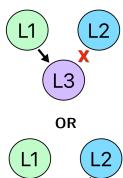
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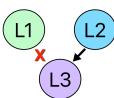
Typological Primacy Model Rothman (2010)

The most **typologically similar** language transfers

Lexicon

Phonology





Models of L3

Acquisition

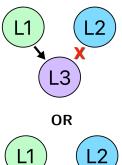
Typological Primacy Model Rothman (2010)

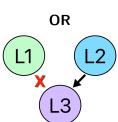
The most typologically similar language transfers

Lexicon

Phonology

Morphology





Acquisitio

Models of L3 Acquisition

Procedures

Key Finding

Key Findin

"Beginners" vs. L3 Initial

State

Procedures

Results Key Finding

L3 Phonolog

Rackground

Dackground

Particip

Results

Key Findings

Summary

Typological Primacy Model Rothman (2010)

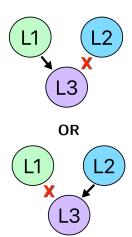
The most **typologically similar** language transfers

Lexicon

Phonology

Morphology

Syntax



L3 Grammatic Gender Acquisition

Models of L3 Acquisition

Acquisition
Procedures
Results

Key Findin

L3
"Beginners"
vs. L3 Initia

State

Procedures

Key Finding

L3 Phonolog

Background

Participants

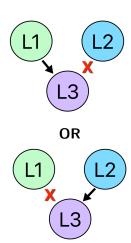
Results

Key Finding

Summar

Language of Community Hypothesis Fallah et al. (2016)

The language using the surrounding **community** transfers



Acquisitio Models of L3

Acquisition

Key Findings

Key Finding

"Beginners" vs. L3 Initia

State

Procedures

Results Key Finding

L3 Phonology

Background

Dackground

Participa

Results

Key Finding

Summar

Piecemeal Transfer Models

Cumulative Enhancement Model

Linguistic Proximity Model

Scalpel Model

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Grammati Gender

Acquisitio

Models of L3 Acquisition

Procedure

Results

Key Finding

"Beginners" vs. L3 Initial

State State

Procedures

Kesults

L3 Phonology

Rackeroun

Dackgroun

Particip

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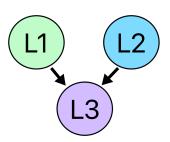
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Summary

Cumulative Enhancement Model

Flynn et al. (2004)

Both languages can transfer features.



Models of L3

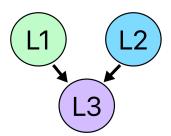
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Cumulative Enhancement Model

Flynn et al. (2004)

Both languages can transfer features.

Facilitative features will transfer.



Models of L3 Acquisition

Procedures

Key Finding

"Beginners"
vs. L3 Initia

State

Procedures

Key Findings

Rackground

Background

Particip

Results

Key Finding

Summar

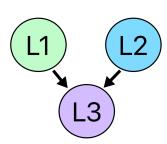
Cumulative Enhancement Model

Flynn et al. (2004)

Both languages can transfer features.

Facilitative features will transfer.

TLA is **cumulative**: the grammar transfers and develops features over time.



Development

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L3 Grammatic

Acquisitio

Models of L3 Acquisition

Procedures

V-.. Finding

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"Beginners" vs. L3 Initial

State

Procedures

Kesuits

L3 Phonology

Backgroun

Procedures

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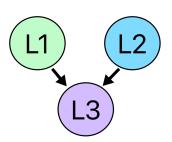
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Summary

Linguistic Proximity Model

Westergaard et al., (2017)

Similar to CEM, except...



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Acquisitio Models of L3

Acquisition

Results

Key Finding

"Beginners" vs. L3 Initia

State

Procedures

Key Finding

L3 Phonology

Backgroup

Procedures

Populto

Key Findin

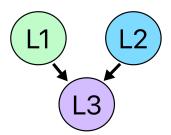
Summary

Linguistic Proximity Model

Westergaard et al., (2017)

Similar to CEM, except...

Facilitative and non-facilitative features will transfer.



Acquisition

Procedures

Key Finding

"Beginners" vs. L3 Initia

State

Procedures

Key Findings

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Background

Particip

Results

Key Finding

Summan

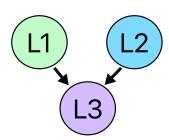
Linguistic Proximity Model

Westergaard et al., (2017)

Similar to CEM, except...

Facilitative and non-facilitative features will transfer.

Typology influences transfer.



L3 Grammatic Gender

Acquisitio Models of L3

Acquisition

Results

Key Finding

"Beginners"
vs. L3 Initial

Backgrou

Procedures

Key Finding

L3 Phonology

Backgroup

Procedures

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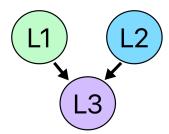
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Summan

Scalpel Model Slabakova, (2017)

Similar to CEM and LPM, except...

Cognitive and experiential factors can also influence transfer.



Development

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Models of L3 Acquisition

Models of L3 Initial Transfer

Whole-Transfer Models

Piecemeal-Transfer Models

L1 Transfer

Hermas, 2010

L2 Status Factor Bardel & Falk, 2007

Typological Primacy Rothman, 2010

Language of Community Fallah et al. 2016

Cumulative Enhancement

Flynn et al., 2004

Linguistic Proximity Westergaard et al., 2017

> Scalpel Model Slabakova, 2017

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Grammatica Gender Acquisition

Models of L3 Acquisition

Procedures Results

Key Finding

"Beginners" vs. L3 Initial

vs. L3 Initial
State

Background

Procedures

Key Findings

L3 Phonology

Background Procedures

Participa

Results

Summan

Factors in L3 Initial Transfer

L3 Grammatica Gender Acquisition

Models of L3 Acquisition

Procedures
Results
Key Findings

L3
"Beginners"
vs. L3 Initial

vs. L3 Initial State Background

Results Key Findings

L3 Phonology

Background Procedures Participants

Key Finding

Summany

Factors in L3 Initial Transfer

Naive vs. non-native status/Age of acquisition/Order of acquisition.

Linguistic similarity between languages.

Grammatica Gender Acquisition

Models of L3 Acquisition

Procedures

Key Finding

"Beginners

vs. L3 Initial State

Background

Procedures

Key Findings

L3 Phonology

Background

Procedures

D 1

V... Finding

Summary

Grammatical Gender

Models of L3

Acquisition

Key Findings

Grammatical Gender

The man	The woman	The girl
Masculine	Feminine	Neuter

Models of L3

Acquisition

Grammatical Gender

Der Mann	Die Frau	Das Mädchen
The man	The woman	The girl
Masculine	Feminine	Neuter

L1 gender can transfer to L2 (Franceschina, 2005)

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Models of L3

Acquisition

Grammatical Gender

Der Mann	Die Frau	Das Mädchen
The man	The woman	The girl
Masculine	Feminine	Neuter

L1 gender can transfer to L2 $_{(Franceschina, 2005)}$ Even between typologically different languages (Sabourin, 2001)

Acquisitio Models of L3

Acquisition

Procedures Results

Key Finding

L3
"Beginners"
vs. L3 Initia

State

Procedures

Results Key Findings

L3 Phonolog

Background

Duckgroun

Particip

Results

Key Finding

Summar

Grammatical Gender

Der Mann	Die Frau	Das Mädchen
The man	The woman	The girl
Masculine	Feminine	Neuter

L1 gender can transfer to L2 _(Franceschina, 2005) Even between typologically different languages (Sabourin, 2001)

L2ers without gender in their L1 are able to develop a gender system

(White et al., 2004; Sagarra and Herschensohn, 2010)

Acquisitio

Models of L3 Acquisition

Procedures

Key Finding

"Beginners"
vs. L3 Initial

State

Procedures

Kev Finding

L3 Phonolo

Background

Danadona

Participa

Kesults

Key Finding

Summar

Grammatical Gender

Der Mann	Die Frau	Das Mädchen
The man	The woman	The girl
Masculine	Feminine	Neuter

L1 gender can transfer to L2 _(Franceschina, 2005) Even between typologically different languages (Sabourin, 2001)

L2ers without gender in their L1 are able to develop a gender system

(White et al., 2004; Sagarra and Herschensohn, 2010)

How do L1 vs L2 gender systems transfer to L3?

Grammatica Gender

Models of L3 Acquisition

Procedures Results

Key Finding

"Beginners

vs. L3 Initial

Rackground

Procedures

Kesults Key Findings

L3 Phonology

Backgroun

Procedures

1 articipa

V. Finding

Summan

Language Triad

L3 Grammatio Gender

Models of L3

Acquisition

Procedures Results

Key Findin

"Beginners" vs. L3 Initial

vs. L3 Initial State Background

Procedures

Key Finding

L3 Phonology

Backgroun

Procedures

D 1

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Key Finding

Summary

Language Triad

English

Spanish

L3 German

Models of L3 Acquisition

Language Triad

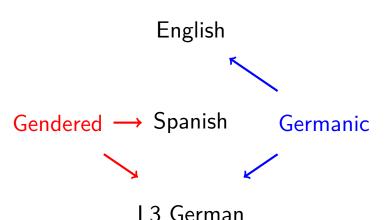
English

Gendered → Spanish



L3 German

Language Triad



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Grammatica Gender

Models of L3 Acquisition

Procedures Results

Key Finding

"Beginners"

vs. L3 Initial State

Background

Procedures

Key Findings

L3 Phonology

Background

Procedures

Results

Kev Finding

Summan

Predictions of L3 Models

Models of L3 Acquisition

Predictions of L3 Models

Will L3 learners transfer their Spanish grammatical gender knowledge to L3 German?

Models of L3

Acquisition

Predictions of L3 Models

Will L3 learners transfer their Spanish grammatical gender knowledge to L3 German?

	L1 English L2 Spanish	L1 Spanish L2 English
Piecemeal Transfer Models	Yes	Yes
L1 Transfer	No	Yes
L2 Status	Yes	No
Typological Primacy	No	No

L3 Grammatic Gender

Acquisiti

Procedures

Results

Key Finding

"Beginners

vs. L3 Initial

State

Баскующи

Procedures

Key Findings

L3 Phonology

Backgroun

Procedures

Participa

Results

Key Finding

Summar

Participants

Procedures

Background

Key Findings

Participants

Sequential Spanish/English bilinguals

Procedures

Participants

Sequential Spanish/English bilinguals L3 German was being learned as a foreign language

Procedures

Participants

Sequential Spanish/English bilinguals L3 German was being learned as a foreign language Intermediate or higher L2 proficiency

Acquisition

Procedures

Key Findin

L3 "Beginners

"Beginners" vs. L3 Initia State

Background Procedures

Key Findings

Background

Procedures

Results

Key Findin

Summary

Participants

Sequential Spanish/English bilinguals
L3 German was being learned as a foreign language
Intermediate or higher L2 proficiency

Language Background	Number of Participants
L1 English L2 Spanish L3 German	11
L1 Spanish L2 English L3 German	10
L1 English L2 German	11

Grammatica Gender

Acquisitio

Acquisition

Procedures

Key Findin

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"Beginners" vs. L3 Initia

State

Procedures

Results

Key Finding

L3 Phonology

Backgroun

Procedures

Participa

Results

Key Finding

Summar

German Grammaticality Judgement Task

Gender Mismatch

*Das Baum ist groß $The_{[N]}$ tree $_{[M]}$ is tall

Grammatic Gender

Models of L3

Acquisition Procedures

Poculto

Key Findin

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"Beginners' vs. L3 Initia State

Background

Procedures Results

Key Finding

L3 Phonolog

Background

Procedures

Rosults

Key Finding

Summar

German Grammaticality Judgement Task

Gender Mismatch

*Das Baum ist groß $The_{[N]}$ tree $_{[M]}$ is tall

Words reflecting biological gender were not included

Procedures

German Grammaticality Judgement Task

Gender Mismatch

*Das Baum ist groß The [N] tree [M] is tall

Words reflecting biological gender were not included

Error questions were balanced in terms of:

Procedures

German Grammaticality Judgement Task

Gender Mismatch

*Das Baum ist groß The_[N] tree_[M] is tall

Words reflecting biological gender were not included

Error questions were balanced in terms of:

German Gender

Error Direction (M \rightarrow F, M \rightarrow N ect.)

Spanish Gender

Issues in Third

Procedures

Background

Key Findings

Scoring

Gender Assignment vs. Gender Concord

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Gender Assignment vs. Gender Concord

Grammatical Gender Task

Procedures

Key Findings

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Gender Assignment vs. Gender Concord

Grammatical Gender Task

Tür (Door_F)

Grammatic Gender Acquisition

Acquisition
Models of L3

Procedures

Results

Key Finding

"Beginners'
vs. L3 Initia

State Background

Procedures Results

L3 Phonolog

Background

Procedures Participants

Kesults Key Finding

Summary

Megan M. Brown

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Acquisition

Procedures

Procedure

Key Finding

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"Beginners"
vs. L3 Initia

State Background

Procedures

Key Finding

L3 Phonolog

Background

Participa

Results

Key Finding

Summary

Gender Assignment vs. Gender Concord

Grammatical Gender Task

Tür (Door_F)

 Der_M

Die_F

Das_N

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L3 Grammatica Gender Acquisition

Acquisition

Procedures

Results

Key Finding

L3 "Beginner

"Beginners" vs. L3 Initia State

Procedures

Key Findings

L3 Phonol

Background

Results

Key Finding

Summan

Gender Assignment vs. Gender Concord

Grammatical Gender Task

Tür (Door_F)

Der_M Die_F

 Das_N

Grammaticality judgment tasks were graded based on participants' perceived gender of individual lexical items.

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Grammatica Gender Acquisition

Models of L Acquisition

Procedures

Populto

Key Findin

13

"Beginners" vs. L3 Initia State

Background

Results Key Findings

L3 Phonol

Background

Participa

Results

Key Findin

Summary

Gender Assignment vs. Gender Concord

Grammatical Gender Task

Tür (Door_F)

Der_M Die_F

Das_N

Grammaticality judgment tasks were graded based on participants' perceived gender of individual lexical items.

Issues in Third
Language
Acquistion
and
Development

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L3 Grammatica

Gender Acquisition

Models of L3 Acquisition

Procedures Results

Koy Einding

Key Finding

"Beginners"

vs. L3 Initial

State

Procedures

Key Findings

L3 Phonology

Backgroun

Procedures

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V... Finding

Summary

Results

Brown (2020)

Issues in Third Language Acquistion and Development

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Brown

Gender Acquisition

Models of L3

Procedures

Results

Key Findin

"Beginners"

vs. L3 Initial

Procedures

Key Findings

L3 Pho

Procedures

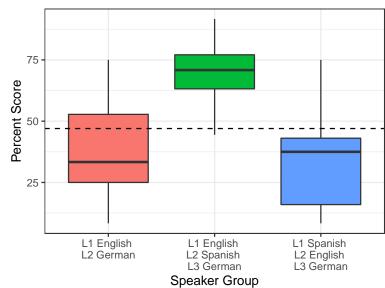
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Kev Finding

Key Findings

Summary





Acquisitio

Acquisition

Procedures

Key Findings

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"Beginners" vs. L3 Initial

State

Procedures

Key Finding

L3 Phonology

Backgroun

Procedures

Farticip

Kesults

Summar

Findings Experiment 1

Trilinguals with L2 Spanish were better at identifying gender errors in L3 German.

Key Findings

Findings Experiment 1

Trilinguals with L2 Spanish were better at identifying gender errors in L3 German.

L2 Status Factor Model

Key Findings

Findings Experiment 1

Trilinguals with L2 Spanish were better at identifying gender errors in L3 German.

L2 Status Factor Model

Scalpel Model (Experiential/Cognitive Factors)

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L3 Grammat

Gender Acquisitio

Models of L3

Procedures

Results

Key Findings

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"Beginners"

vs. L3 Initial State

Background

Procedures

Key Findings

L3 Phonology

Backgroui

Procedures

D 1

V--- Finding

Summary

Findings Experiment 1

BUT...

Acquisition Procedures

Results

Key Findings

"Beginners" vs. L3 Initia

State

Procedures

Kesults

L3 Phonology

Backgroun

Procedures

D 1

V--- Findin

C.....

Summary

Findings Experiment 1

BUT...

No interference was found from nouns with different Spanish genders.

Acquisitio

Acquisition Procedures

Results

Key Findings

L3
"Beginners"
vs. L3 Initia

State

Procedures

Key Finding

L3 Phonolog

Background

Procedures

Results

Key Finding

Summary

Findings Experiment 1

BUT...

No interference was found from nouns with different Spanish genders.

Many participants were beginners but not "initial state" learners

Key Findings

Findings Experiment 1

BUT...

No interference was found from nouns with different Spanish genders.

Many participants were beginners but not "initial state" learners

Are these results from initial transfer or some sort of learning advantage!?

Grammatica Gender

Models of L3

Acquisition

Results

Key Finding

"Beginners

vs. L3 Initial

Background

Procedures

Key Findings

L3 Phonology

Backgrour

Procedures

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Summan

Experiment 2

Background

Key Findings

Experiment 2

True initial state L3 learners

Background

Experiment 2

True initial state L3 learners

Grammatical gender

Background

Experiment 2

True initial state L3 learners

Grammatical gender

Artificial Germanic Language

Background

Experiment 2

True initial state L3 learners

Grammatical gender

Artificial Germanic Language

Avoids intertwinement of German DP features (i.e. gender, number, case, and definiteness)

Background

Experiment 2

True initial state L3 learners

Grammatical gender

Artificial Germanic Language

Avoids intertwinement of German DP features (i.e. gender, number, case, and definiteness)

Precedent in the L2 acquisition literature Brooks et al. (1993), Siegelman & Arnon (2015) Wonnacott, Brown & Nation (2017), Culbertson, Gagliardi & Smith (2017)

Issues in Third

Procedures

Artificial Language

9 nouns

3 masculine, 3 feminine, 3 neuter

L3 Grammatic

Acquisitio

Models of L3

Procedures

Results

Key Finding

L3 "Beginners" vs. L3 Initial

State

Procedures

Results Key Findings

L3 Phonology

Backgroun

Procedures

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Artificial Language

9 nouns

3 masculine, 3 feminine, 3 neuter

4 determiners

1 masculine, 1 feminine, 1 neuter, 1 plural

5 adjectives

suffixes: 1 masculine, 1 feminine, 1 neuter, 1 plural

Artificial Language

9 nouns

3 masculine, 3 feminine, 3 neuter

4 determiners

1 masculine, 1 feminine, 1 neuter, 1 plural

5 adjectives

suffixes: 1 masculine, 1 feminine, 1 neuter, 1 plural

1 carrier phrase

L3 Grammatica Gender

Models of L3

Acquisition Procedures

Results

Key Finding

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"Beginners"
vs. L3 Initia

State

Procedures

Results

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Backgroun

Procedure

Participa

Rosults

Key Finding

Summary

Artificial Language

Issues in Third Language Acquistion and Development

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Grammatica Gender

Models of L3 Acquisition Procedures

Key Finding

"Beginners"
vs. L3 Initial

State

Procedures

Results Key Findings

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Background

Procedures

Reculte

Key Findings

Summary



Grammatica Gender Acquisition

Acquisition

Procedures

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"Beginners' vs. L3 Initia

State

Procedures

Key Findings

L3 Phonolog

Background

Procedures

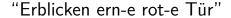
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Results

Key Finding

Summary





Issues in Third Language Acquistion and Development

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L3 Grammatica Gender Acquisition

Models of L Acquisition

Procedures

Key Finding

"Beginners' vs. L3 Initia

Background

Procedures

Key Findings

L3 Phonology

Background

Participa

Results

Key Finding

Summary





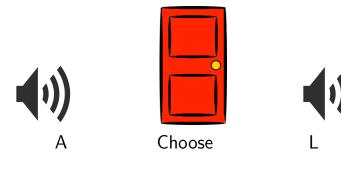


"Erblicken ern rot-e Tür"

Procedures

Key Findings

Key Findings



Grammatic Gender Acquisition

Models of L3 Acquisition

Procedures

Key Finding

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"Beginners"
vs. L3 Initial

State

Procedures

Kesults Key Findings

L3 Phonology

Background

Procedures

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Summary

Participants

Language Background	Number of Participants
L1 English L2 Spanish	7
L1 Spanish L2 English	4
L1 English L2 Mandarin	4

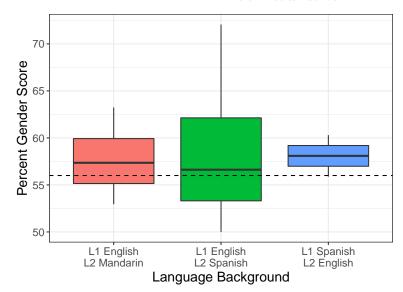
Issues in Third Language Acquistion and Development

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Results

Experiment 2 Results

Grammatical Gender



L3

Grammatica Gender

Acquisitio

Models of L Acquisition

Procedures

Results

Key Findin

L3

"Beginners" vs. L3 Initial

State

Procedures

Results

L3 Phonolog

Backgrour

Procedures

Particip

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Summar

Results

No group differences for grammatical gender (TPM, Piecemeal Transfer/Developmental Models)

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Acquisition

Procedures

Key Finding

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"Beginners" vs. L3 Initia

Background

Procedures

Results Key Finding

L3 Phonolog

Backgroun

Баскующи

Particip

Results

Key Finding

Summan

Results

No group differences for grammatical gender (TPM, Piecemeal Transfer/Developmental Models)

Overall poor performance across all groups on grammatical questions

(Piecemeal Transfer Models)

Experiment 1:

Grammatical Gender Acquisition

Acquisition

Procedures Results

Key Finding

L3

vs. L3 Initial

State

Procedures

Key Findings

I 3 Phonology

Background Procedures

Populto

Kov Einding

Summar

L3 Grammatic

Acquisitio

Models of L Acquisition

Procedures

Key Findin

13

"Beginners"
vs. L3 Initial

State

Procedures

Key Findings

L3 Phonolog

Background

Procedures

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Kev Findin

Summary

Experiment 1:

Beginner L3 German learners (< 1 year)

L2 Spanish advantage in L3 German gender

Grammat

Acquisitio

Models of L3

Acquisition

Procedures Results

Key Finding

L3

"Beginners"
vs. L3 Initial

State

Procedures

Key Findings

L3 Phonolog

Backgroun

Procedure:

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Key Finding

Summary

Experiment 1:

Beginner L3 German learners (< 1 year)

L2 Spanish advantage in L3 German gender

Experiment 2:

Initial State L3 German learners

No L2 Spanish advantage in L3 German gender or number

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Acquisitio

Models of L.

Procedures

Results

Key Findin

"Beginners"

vs. L3 Initial State

Procedure

Key Findings

L3 Phonolo

Background

Procedure

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Key Findin

Summarv

Experiment 1:

Beginner L3 German learners (< 1 year)

L2 Spanish advantage in L3 German gender

Experiment 2:

Initial State L3 German learners

No L2 Spanish advantage in L3 German gender or number

Perhaps an L3 developmental difference?

Key Findings

Transfer vs. Development

Whole-Transfer Models

Piecemeal-Transfer Models

L1 Transfer Hermas, 2010

L2 Status Factor Bardel & Falk, 2007

Typological Primacy Rothman, 2010

Language of Community Fallah et al. 2016

Cumulative Enhancement Flynn et al., 2004

Linguistic Proximity Westergaard et al., 2017

> Scalpel Model Slabakova, 2017

Development

Megan M. Brown

Background

Key Findings

Transfer vs. Development

Key Findings

Transfer vs. Development

What exactly are the "initial stages"?

L3 Grammat

Gender Acquisitio

Models of L3

Acquisition

Procedures

Kev Finding

"Beginners" vs. L3 Initial

State

Procedures

Results Key Findings

Background

Procedures

D 1

Kov Eindin

Summan

Transfer vs. Development

What exactly are the "initial stages"?

How might post-initial state development differ?

Grammat Gender

Acquisitio

Acquisition

Procedures

results

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"Beginners"
vs. L3 Initia

State Background

Procedures

Key Findings

Rackground

Background

Particip

Results

Key Findin

Summan

Transfer vs. Development

What exactly are the "initial stages"?

How might post-initial state development differ?

Transfer vs. Cross-linguistic influence (CLI)

There is still much exiting work to do in L3 acquisition!

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Acquisition Procedures

Procedures Results

Key Findin

"Beginners"
vs. L3 Initia

State

Background

Procedures Results

L3 Phonology

Background

Backgroun

Participa

Results

Key Finding

Summan

Experiment 3

rCLI in L3 Phonology

L3 Phonology

Regressive Cross-Linguistic Influence

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Grammatic Gender Acquisition

Models of L Acquisition

Procedures

Key Finding

"Beginners"
vs. L3 Initia

State Background

Results

L3 Phonology

Background

Participa

Rosults

Key Findings

Summar

Experiment 3 rCLI in L3 Phonology

L3 Phonology

Regressive Cross-Linguistic Influence



Dr. Charles Chang Boston University

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Language
Acquistion
and
Development

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L3 Grammatica Gender

Models of La

Procedures

Key Finding

"Beginners" vs. L3 Initial

State

Procedures

Danislan

Key Findings

L3 Phonology

Backgroun

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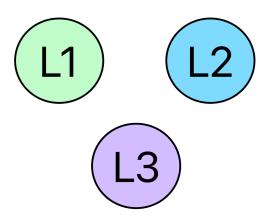
Particip

Results

Key Finding

Summary

Experiment 3 rCLI in L3 Phonology



L3 Grammatica Gender Acquisition

Models of L Acquisition

Procedures

Key Finding

L3
"Beginners"
vs. L3 Initia

State

Procedures

Key Finding

L3 Phonology

Background

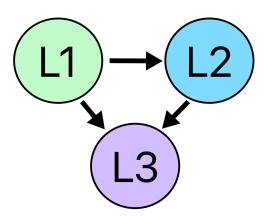
Procedures

Results

Key Finding

Summary

Progressive Cross-Linguistic Influence (pCLI)



L3 Grammatic Gender

Acquisitio

Acquisition

Results

Key Finding

"Beginners" vs. L3 Initial

vs. L3 Initia State

Procedures

Results

Key Finding

L3 Phonolog

Background

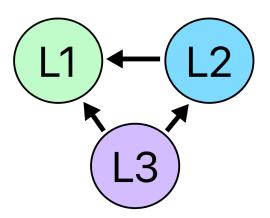
Procedures

Rosults

Key Finding

Summary

Regressive Cross-Linguistic Influence (rCLI)



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Brown

Grammatica Gender

Acquisitio

Acquisition

Procedures

Results

Key Finding

"Beginners

vs. L3 Initial

State

Background

Results

Key Findings

L3 Phonology

Background

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Participa

Results

Key Finding

Summan

Models of Trilingual rCLI

Background

Models of Trilingual rCLI

Phonological Permeability Hypothesis (PPH: Cabrelli Amaro and Rothman, 2010)

Background

Models of Trilingual rCLI

Phonological Permeability Hypothesis (PPH: Cabrelli Amaro and Rothman, 2010)

Phonological systems developed in childhood vs. adulthood are fundamentally different

Issues in Third

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Background

Models of Trilingual rCLI

Phonological Permeability Hypothesis (PPH: Cabrelli Amaro and Rothman, 2010)

Phonological systems developed in childhood vs. adulthood are fundamentally different

Systems developed in childhood are more stable

Issues in Third

Acquisitio

Acquisition

Procedures

Key Findin

"Beginners" vs. L3 Initia

vs. L3 Initia State

Procedures

Results Key Finding

L3 Phonolo

Background

Backgroun

Particip

Results

Key Finding

Summar

Models of Trilingual rCLI

Phonological Permeability Hypothesis (PPH: Cabrelli Amaro and Rothman, 2010)

Phonological systems developed in childhood vs. adulthood are fundamentally different

Systems developed in childhood are more stable

rCLI from an L3 is more likely to impact the L2 than the L1

Grammatic Gender

Acquisition

Acquisition

Results

Key Finding

1.0

"Beginners"
vs. L3 Initia

State

Procedures

Key Finding

L3 Phonolog

Background

Procedures Participants

Populto

Key Findin

Summar

Typological Similarity in Trilnigual rCLI

The overall similarity between a speakers languages has been found to significantly impact **bilingual rCLI**

Schmid and Köpke (2017)

Grammatic Gender

Models of L3

Acquisition

Results

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"Beginners"
vs. L3 Initial

State

Procedures

Results Key Findings

_3 Phonology

Background

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Particip

Results

Key Finding

Summar

Typological Similarity in Trilnigual rCLI

The overall similarity between a speakers languages has been found to significantly impact **bilingual rCLI**

Schmid and Köpke (2017)

as well as trilingual pCLI

Rothman (2010 et seq), Westergaard et al., (2017)

L3 Grammati

Acquisitio

Models of L3

Acquisition

Procedures

Kev Finding

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"Begin

vs. L3 Initial State

Backgrou

Procedures

Kev Finding

L3 Phonolog

Background

Dackgroun

Particip:

Results

Key Findin

Summary

Research Quesitons

Does typological similarity play a role in rCLI from L3 to L1/L2?

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L3 Grammatica Gender

Acquisitio

Acquisition

Results

Key Finding

Key Finding

"Beginners" vs. L3 Initial

vs. L3 Initial State

Васкдгог

Results

Key Finding

L3 Phonology

Background

Procedures

Particip

Results

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Summary

Research Quesitons

Does typological similarity play a role in rCLI from L3 to L1/L2?

This project examines this in regards to **speech rhythm**.

Background

Speech Rhythm

Rhythm is the sense of movement in speech

Development

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Background

Speech Rhythm

Rhythm is the sense of movement in speech Syllable-timed (Spanish, French) Stress-timed (English, German) Mora-timed (Japanese)

Development

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Background

Speech Rhythm

Rhythm is the sense of movement in speech Syllable-timed (Spanish, French) Stress-timed (English, German) Mora-timed (Japanese)

Adult learners are unlikely to develop an L2 rhythmic system that is comparable to that of a native speaker,

Background

Speech Rhythm

Rhythm is the sense of movement in speech Syllable-timed (Spanish, French) Stress-timed (English, German) Mora-timed (Japanese)

Adult learners are unlikely to develop an L2 rhythmic system that is comparable to that of a native speaker, BUT...

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Background

Speech Rhythm

Rhythm is the sense of movement in speech Syllable-timed (Spanish, French) Stress-timed (English, German) Mora-timed (Japanese)

Adult learners are unlikely to develop an L2 rhythmic system that is comparable to that of a native speaker, BUT...

They are able to develop an L2 rhythmic system which is distinct from the L1

(Guilbault, 2002; Ordin & Polyanskaya, 2015)

Development

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Key Findings

Background

Research Questions

L3 Grammatic

Acquisitio

Acquisition

Procedures

Key Findin

"Beginners" vs. L3 Initial

vs. L3 Initial State

Procedures Procedures

Key Findin

L3 Phonology

Background

Procedures

Danulan

Key Finding

Summan

Research Questions

English

German

Spanish

L3 Grammatica Gender

Models of L Acquisition

Procedures Results

Key Finding

L3 "Beginners' vs. L3 Initia

vs. L3 Initia State

Procedures Results

Key Finding

L3 Phonolog

Background

Procedures

Results

Key Finding

Summar

Research Questions

English (Stress-timed)

German (Stress-timed)

Spanish (Syllable-timed)

L3 Grammatio

Acquisitio

Models of L Acquisition

Procedures

Results

Key Finding

L3

"Beginners" vs. L3 Initial

Background

Procedures

Kev Finding

L3 Phonolog

Background

Procedures

Populto

Key Findin

Summan

Research Questions

English (Stress-timed)

German (Stress-timed)

Spanish (Syllable-timed)

L3 Grammat

Acquisitio

Models of L Acquisition

Procedures

Key Finding

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"Beginners"
vs. L3 Initia

State

Procedures

Key Finding

L3 Phonolog

Background

Procedures

Results

Key Findin

Summary

Research Questions

English (Stress-timed)

German (Stress-timed)

Spanish (Syllable-timed)

Background

Research Question

Which language is more susceptible to rCI 17

Models of L3

Acquisition

Results

Key Finding

13

"Beginners"
vs. L3 Initial

Backgrou

Procedures

Kesuits

L3 Phonology

Background

Procedures

Participa

Key Finding

Summary

Research Question

Which language is more susceptible to rCLI?

Does **similarity** play a role?

L3 Grammat

Gender Acquisition

Acquisition

Procedures Results

Key Finding

"Beginners

vs. L3 Initial State

Background

Procedures

Key Findings

L3 Phonology

Background

Procedure

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Results

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Research Question

Background

Background

Research Question

L1 English, L2 German, L3 Spanish

Background

Research Question

L1 English, L2 German, L3 Spanish

L1 German, L2 English, L3 Spanish

Background

Research Question

L1 English, L2 German, L3 Spanish

L1 German, L2 English, L3 Spanish

L1 English, L2 German

L1 German, L2 English

Models of I Acquisition

Procedures

Key Finding

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"Beginners"
vs. L3 Initia

State

Procedures Results

Key Findings

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Background

Particip

Results

Key Findin

Summar

Research Question

L1 English, L2 German, L3 Spanish

L1 German, L2 English, L3 Spanish

L1 English, L2 German

L1 German, L2 English

Do linguistic similarity and/or order of acquisition influence the degree of rCLI to each language?

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Acquisitio

Models of

Procedure

Results

Key Findin

"Beginners"

vs. L3 Initial State

Backgroun

Procedures

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L3 Phonology

Background

Procedures

Particip

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Summary

Procedure

For each language (English, German, and Spanish)...

Procedures

For each language (English, German, and Spanish)...

Recorded reading task

Gender

Acquisitio

Acquisition

Procedures

Results

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13

"Beginners"
vs. L3 Initia

State

Procedures

Kev Finding

L3 Phonolog

Background Procedures

Participa

Results

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Summary

For each language (English, German, and Spanish)...

Recorded reading task

Written LexTALE Vocabulary Task (Lemhöfer and Broersma, 2012; Izura, Cuetos, and Brysbaert, 2014)

Procedure

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Procedures

For each language (English, German, and Spanish)...

Recorded reading task

Written LexTALE Vocabulary Task (Lemhöfer and Broersma, 2012; Izura, Cuetos, and Brysbaert, 2014)

Picture description task

Development

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L3 Grammation Gender Acquisition

Models of L3

Procedures

Results

Key Findin

1.2

"Beginners" vs. L3 Initia

State Background

Procedures

Key Findings

L3 Phonolog

Background

Procedures

Particip

Results

Summan

Picture Description Task









Grammatic Gender

Models of L3

Procedures

Results

Key Finding

1.2

"Beginners" vs. L3 Initia

State

Procedures

Kesults

L3 Phonology

Procedures Procedures

Particip

Results

Key Findin

Summan

Picture Description Task









- 4 images per language
- 5-20 minutes of speech per language

L3 Gramma

Gender

Models of L3

Acquisition

Procedures Results

Key Findir

"Beginners'

vs. L3 Initial State

Background

Procedures Results

Key Findings

L3 Phonolog

Background

Participants

Results

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Participants

73 participants completed the study

Grammat Gender

Acquisitio

Models of L3

Procedures

Results

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L3 "Beginners" vs. L3 Initial

vs. L3 Initial State

Procedures

Results

La Diversita

Background

Participants

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Participants

73 participants completed the study

Inclusion requirements:

Sequential trilinguals with L2/L3 AoA > 5

Sufficient proficiency and fluency in all of the target languages

No knowledge of other non-target languages

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Acquisition

Procedures

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"Beginners" vs. L3 Initial

State

Procedures

Key Finding

L3 Phonolog

Background Procedures

Participants

Key Findir

Participants

73 participants completed the study

Inclusion requirements:

Sequential trilinguals with L2/L3 AoA > 5

Sufficient proficiency and fluency in all of the target languages

No knowledge of other non-target languages

20 participants met all requirements

12 female, mean age = 35, age range = 18-58

Key Findings

Participants

Participants

Language Background	Number of Participants
L1 English L2 German L3 Spanish	5
L1 German L2 English L3 Spanish	5
L1 English L2 German	6
L1 German L2 English	4

Gender Acquisitio

Models of L3

Acquisition Procedures

Results

Key Findin

"Beginners"
vs. L3 Initial

vs. L3 Initial State

Procedures

Kesults

L3 Phonology

Background

Procedures Participants

Danislan

Kev Finding

Summar

Analysis

Recordings annotated in TextGrids via Praat (Boersma & Weenink, 2009).

L3 Grammatio

Acquisitio

Models of L3

Procedures

Kesults

Key Filldin

"Beginners"
vs. L3 Initia

State

Procedures

Key Finding

L3 Phonology

Background

Participants

Key Finding

Summan

Analysis

Recordings annotated in TextGrids via Praat (Boersma & Weenink, 2009).

Duration of all vowels and consonants marked.

Participants

Analysis

Recordings annotated in TextGrids via Praat (Boersma & Weenink, 2009).

Duration of all vowels and consonants marked.

pprox 1 minute of recorded speech per participant per language.

Background

Key Findings

Participants

Speech Rhythm Measurements

Models of L3

Acquisition Procedures

Results

Key Findin

"Beginners" vs. L3 Initial

State

Procedures

Results

L3 Phonolog

Background

Procedures Participants

Danulan

Key Finding

Summary

Speech Rhythm Measurements

$$%V = \frac{\text{sum of all vocalic interval durations}}{\text{total duration of vocalic and consonantal intervals}} \times 100$$

Procedures

Kesults Key Findings

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"Beginners"
vs. L3 Initia

State Background

Procedures

Key Finding

L3 Phonology

Background

Participants

Results

Summary

Speech Rhythm Measurements

$$%V = \frac{\text{sum of all vocalic interval durations}}{\text{total duration of vocalic and consonantal intervals}} \times 100$$

$$VarcoV = \frac{\text{SD of vocalic interval duration}}{\text{mean vocalic interval duration}} \times 100$$

Models of L3 Acquisition

Procedures Results

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"Beginners"
vs. L3 Initial

State

Procedures

Key Finding

L3 Phonolog

Procedures

Participants

Danislan

Key Findin

Summary

Speech Rhythm Measurements

$$\%V = \frac{\text{sum of all vocalic interval durations}}{\text{total duration of vocalic and consonantal intervals}} \times 100$$

$$VarcoV = \frac{\text{SD of vocalic interval duration}}{\text{mean vocalic interval duration}} \times 100$$

White and Mattys (2007)

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Development

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L3 Grammatic

Gender Acquisition

Models of L3

Acquisition

Procedures

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"Beginners'

vs. L3 Initia

State

Backgroun

Procedures

Key Findings

L3 Phonology

Backgroun

Procedures

Results

Key Findings

Summary

Results

L3 Spanish Rhythm

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Grammatic Gender Acquisition

Models of L3 Acquisition

Procedures Results

Key Finding

"Beginners' vs. L3 Initis

State
Background

Procedures Results

Key Findings

Background

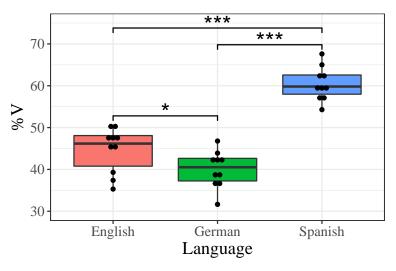
Procedures

Results

Key Finding

Summary

Results L3 Spanish Rhythm



%V in L3 Spanish



L3 Grammatica Gender

Models of L3

Procedures

Key Finding

L3

vs. L3 Initial

State

Procedures Results

Key Findings

L3 Phonolog

Dackground

Participants

Results

Key Finding

Summary

Regressive CLI

English VarcoV

Issues in Third Language Acquistion and Development

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L3 Grammatica Gender Acquisition

Models of L. Acquisition Procedures

Procedures Results

Key Findin

"Beginners'
vs. L3 Initia

State

Background

Procedures Results

I 3 Phonolog

Background Procedures

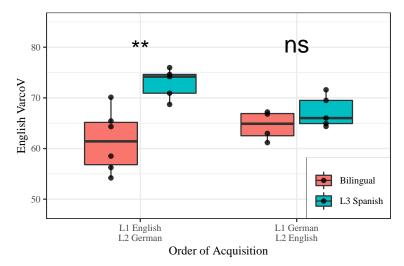
Results

Key Finding

Summary

Regressive CLI

English VarcoV



English VarcoV Values



L3 Grammatic

Acquisition

Acquisition

Procedures

Key Finding

1.2

"Beginners'

vs. L3 Initial State

Backgroun

Procedures

Key Findings

L3 Phonology

Backgroun

Procedures

Results

Van Eindin

Summary

Regressive CLI

German VarcoV

Issues in Third Language Acquistion and Development

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L3 Grammatica Gender Acquisition

Acquisition

Procedures

Results

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"Beginners"
vs. L3 Initia

State
Background

Procedures

Key Finding

L3 Phonolog

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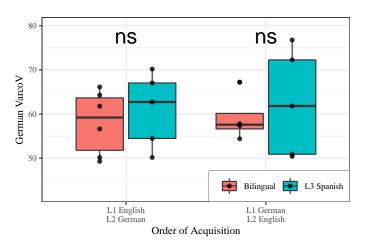
Procedures

Results

Key Finding

Summary

Regressive CLI



German VarcoV Values

Key Findings

Key Findings

Summary of Findings

Issues in Third

Megan M. Brown

L3 Grammatic

Acquisitio

Models of L3

Acquisition

Procedures

Key Findin

"Beginners" vs. L3 Initia

State

Procedures

Results

Key Finding

L3 Phonology

Backgroun

Procedures

Results

Key Findings

Summary

Summary of Findings

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Acquisition

Models of L3 Acquisition

Procedures

Key Findings

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"Beginners"
vs. L3 Initia

State

Procedures

Key Finding

L3 Phonology

Rackeroun

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Participants

Key Findings

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Summan

Summary of Findings

Trilinguals developed a distinct rhythm in L3 Spanish.

Trilinguals had a higher VarcoV in **English** than bilinguals, suggesting rCLI from L3

This is not the case in German

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Acquisition

Procedures

Key Finding

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"Beginners"
vs. L3 Initial

State

Procedures

Results Key Findings

L3 Phonolog

Background

Procedures

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Key Findings

Summan

Summary of Findings

Trilinguals developed a distinct rhythm in L3 Spanish.

Trilinguals had a higher VarcoV in **English** than bilinguals, suggesting rCLI from L3

This is not the case in German

Early trends suggest that L1 is more susceptible to rCLI than L2 in English.

Overall Takeaways

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L3 Grammatica Gender Acquisition

Models of L Acquisition

Procedures Results

Key Finding

"Beginners"
vs. L3 Initia

Background Procedures Results

L3 Phonolog

Background

Participa

Results Kev Finding

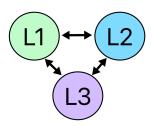
Key Finding

Summary

L3 acquisition, development, and maintenance is a complex process!

CLI can potentially occur in any direction

A variety of factors such as native/non-native status and language similarity can influence the degree of CLI that occurs



Overall Takeaways

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L3 Grammatica Gender

Models of L Acquisition

Procedures Results

Key Findin

"Beginners"
vs. L3 Initial
State

Background Procedures Results

L3 Phonolog

Background
Procedures
Participants

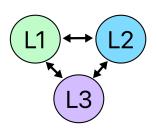
Results Key Finding

Key Findings

L3 acquisition, development, and maintenance is a complex process!

CLI can potentially occur in any direction

A variety of factors such as native/non-native status and language similarity can influence the degree of CLI that occurs



Additional research is needed at all levels of linguistic research!

L3 Grammatical Gender Acquisition

Models of L3 Acquisition Procedures Results

Key Finding

"Beginners" vs. L3 Initial

State

Background

Procedures
Results
Key Findings

L3 Phonology

Background Procedures

Populto

Key Finding

Summary

Questions?

L3 Grammatical Gender Acquisition

Models of L Acquisition

Procedures

Key Finding

"Beginners"

vs. L3 Initial

Background Procedures

Kesults Key Findings

L3 Phonology

Background

Procedures

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Summary

Thank You!