A dynamic perspective on (academic English) L2 lexical development

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2) L2 (writing) from a dynamic perspective: some examples

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4) Preliminary results

Dynamic System Theory (DST)*

- DST can “describe how one state changes into another state in the course of time”

  - a basic *dynamic* model
    - $x_{t+1} = f(x_t)$
  - a basic *static* model
    - $y_i = f(x_i)$

A dynamic system*

- A system
  - Is a collection of components
  - that are related to each other
- A dynamic system
  - Is a collection of *changing* components (connected growers)
  - that *influence* each other

A dynamic system

- Is **nested** and consists of nested interacting ***subsystems***
- **Energy flow** and **limited resources** determine componential relations (connected growers, precursors)
- Constant **self-organization** *and* interaction with the environment
- Never static – move from **attraction to variation**
- Result: iterative, non-linear, unpredictable development
  - Small changes can result in huge effects (Lorenz's Butterfly effect)

A dynamic system – example
(Sammonds 2005)

Dynamic approach to language

- Relevant to logical question of language acquisition
- Knowledge is process, not product (Thelen & Smith 1998) = no performance/competence distinction
- Knowledge consolidation = an attractor state (Thelen and Smith 1998; van Geert 2003).
- Development is iterative, nonlinear, unpredictable; includes, also phenomena such as attrition, fossilization, backsliding (de Bot & Makoni 2005; Larsen Freeman 2006; MacWhinney 2006)
- Variation – meaningful, inherent to development (not just error/noise) (van Geert 1991; van Dijk 2003)

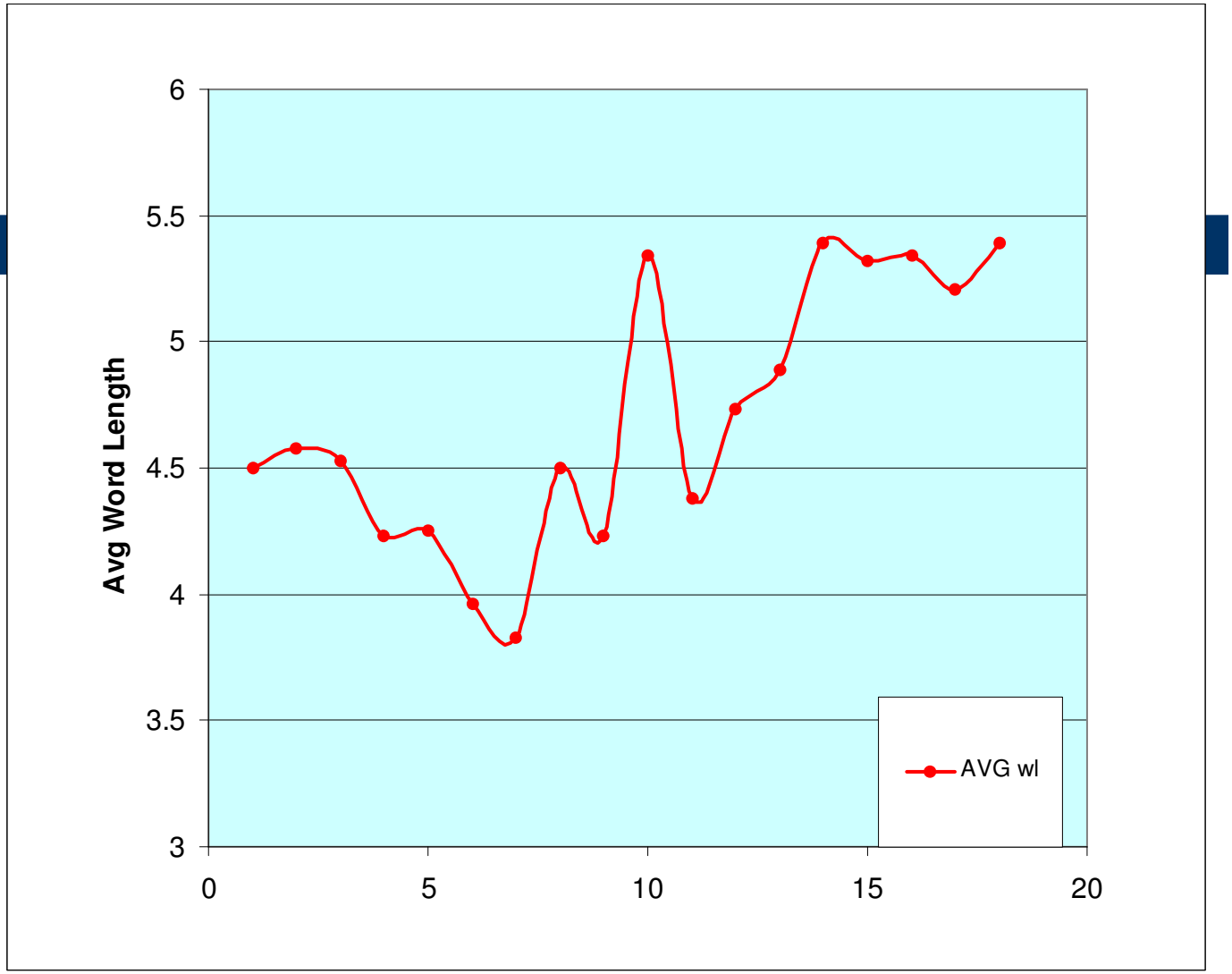
Research from a dynamic perspective: f*ocus on variation*

- Intra-individual (case studies)
- Developmental paths
- Interactions over time
- Variation (changes) in paths, interactions
- Next step: identifying transitions and/or simulating development

A DST approach to SLD

Development in advanced EFL writing of Dutch NS (Verspoor, Lowie & van Dijk):

- Word level
  - word length
  - type token
  - academic vocabulary
- Sentence level
  - sentence length
  - length of NPs
  - dependent clauses
  - proportion of finite verbs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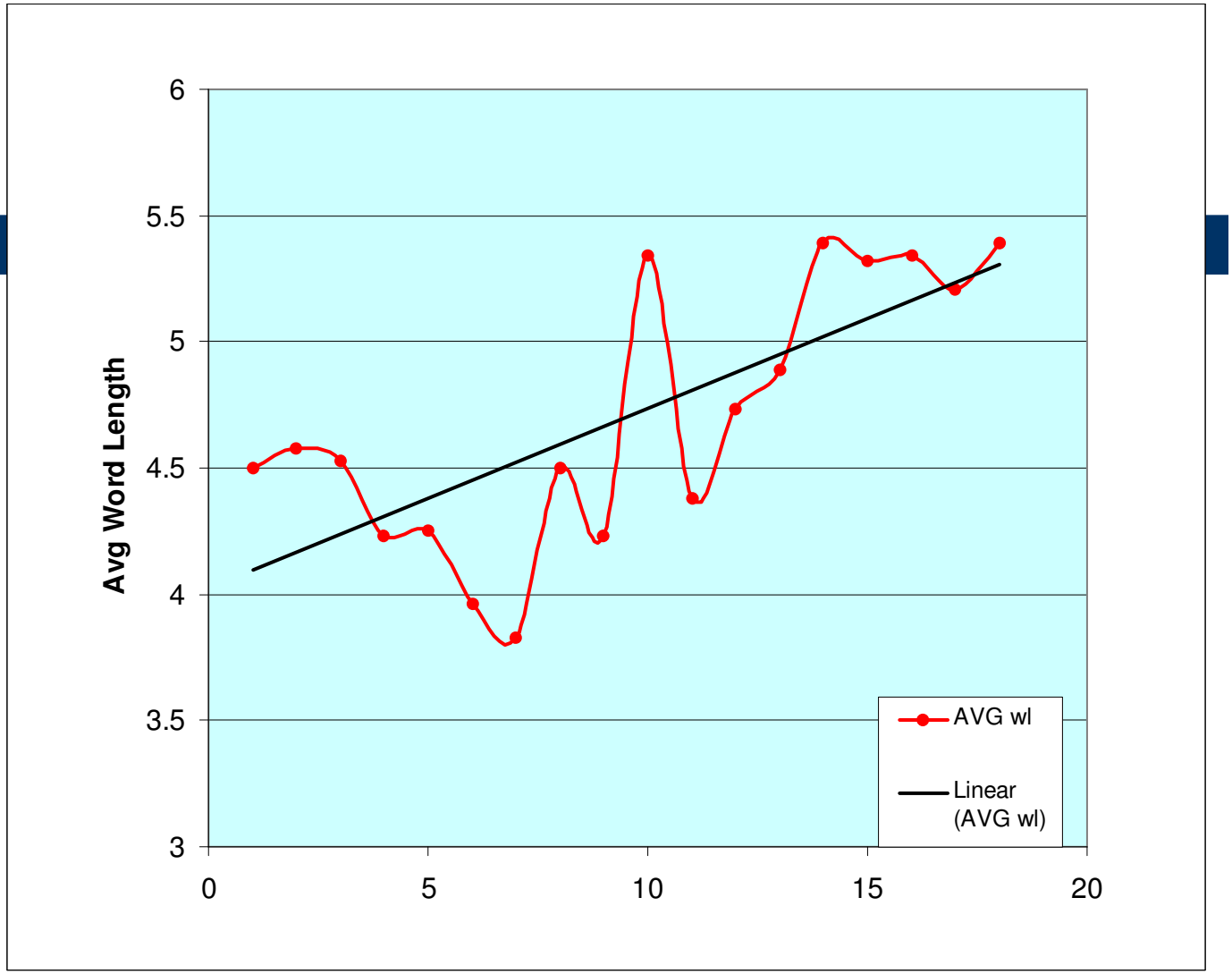
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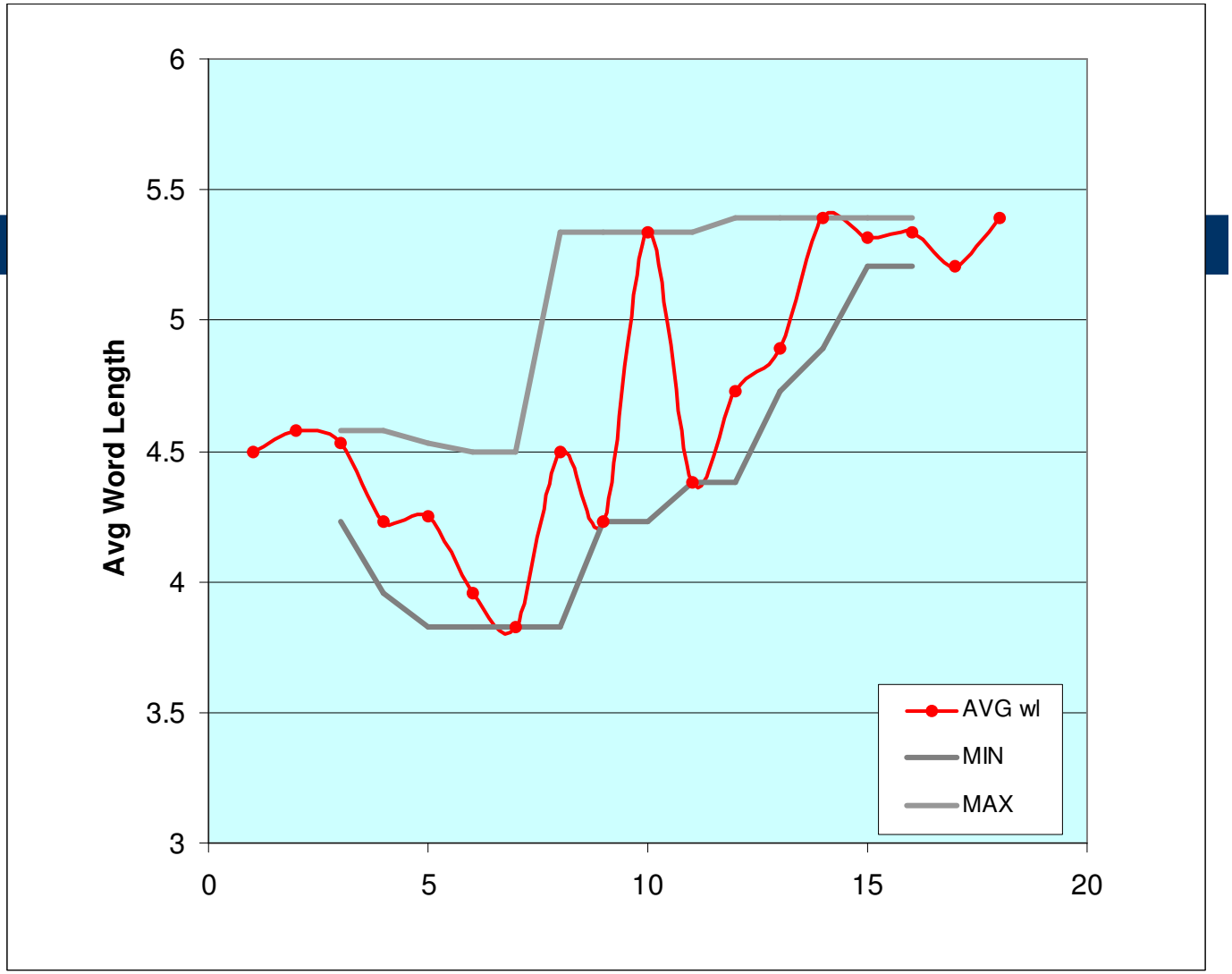
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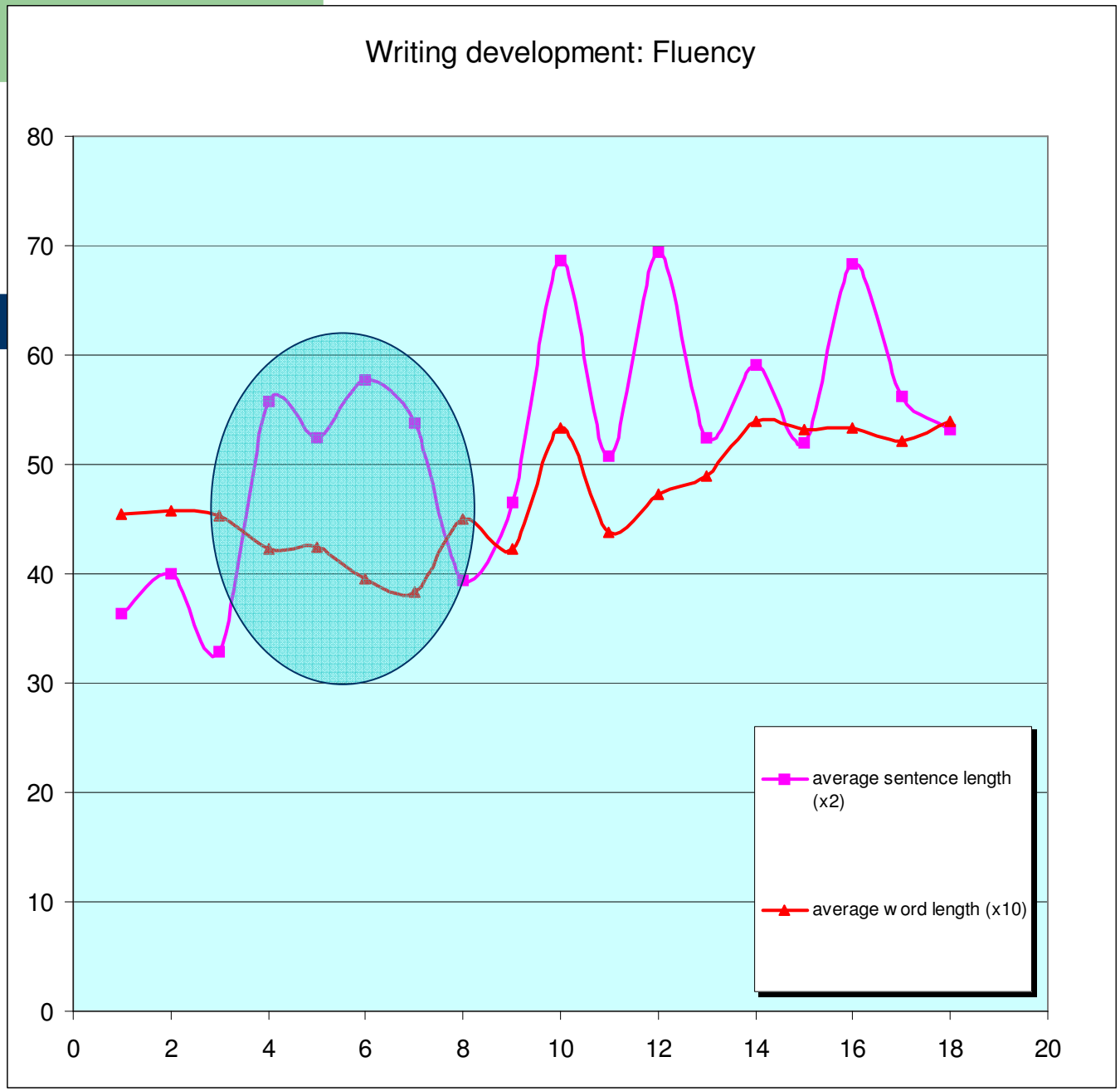
Writing development: Fluency
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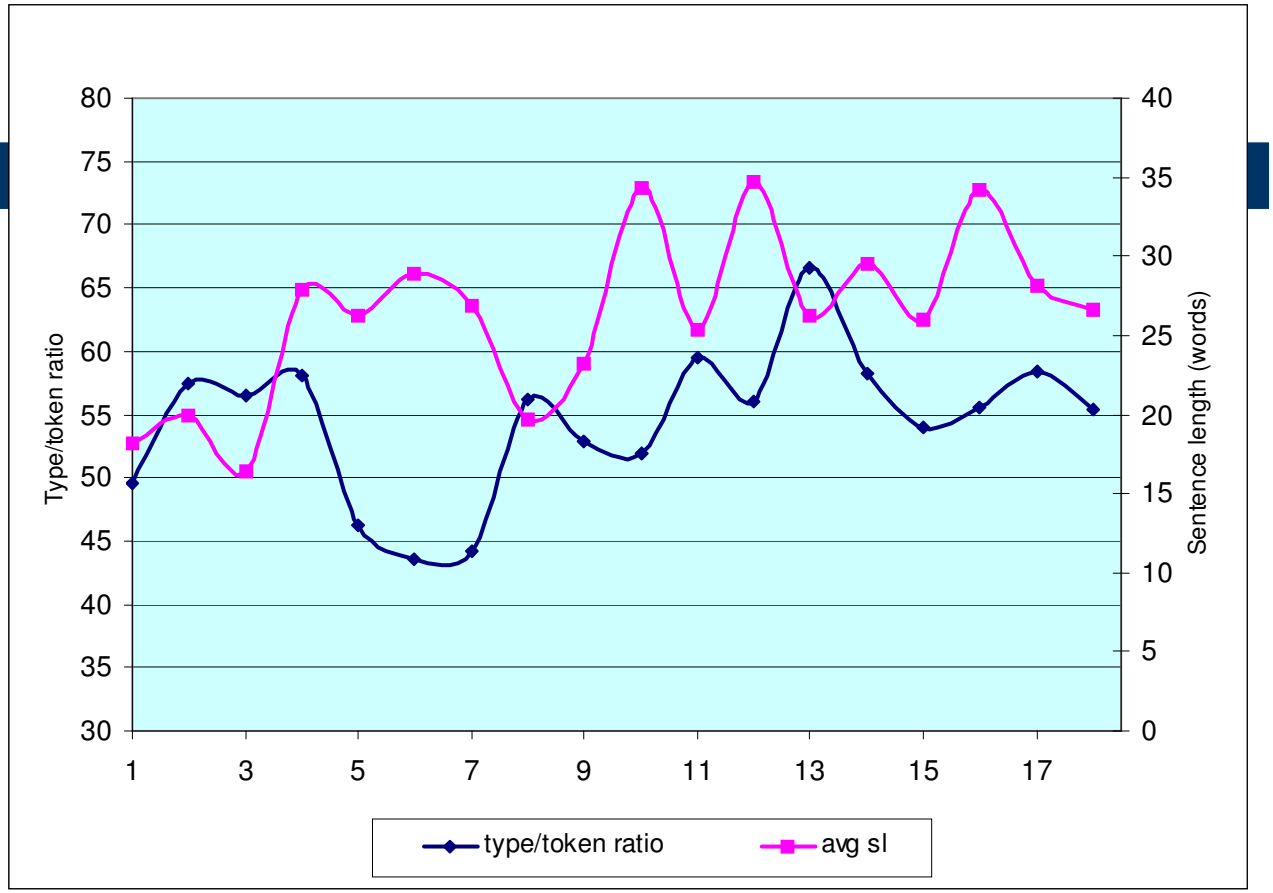
average sentence length (x2)
average word length (x10)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Type/token ratio
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Sentence length (words)
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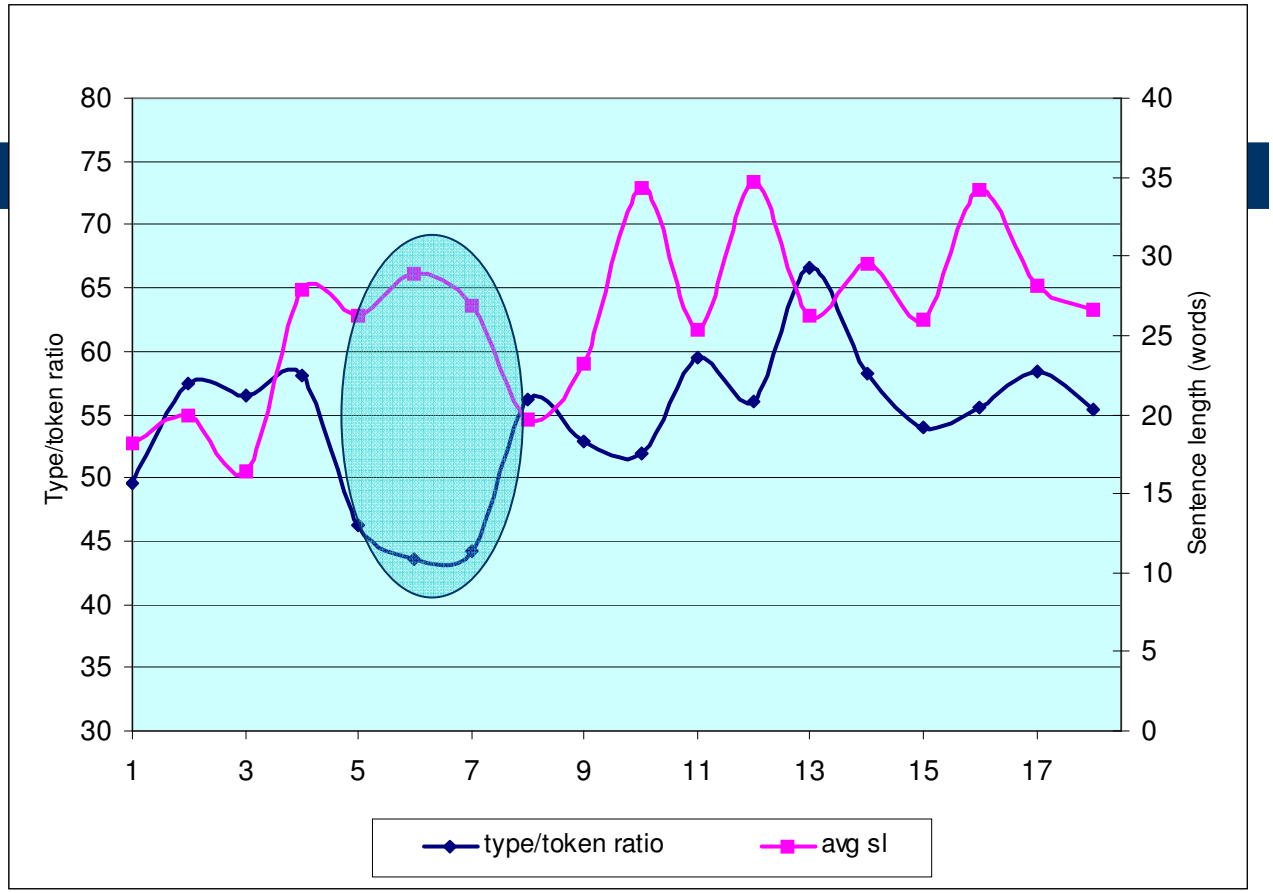
type/token ratio
avg sl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type/token ratio
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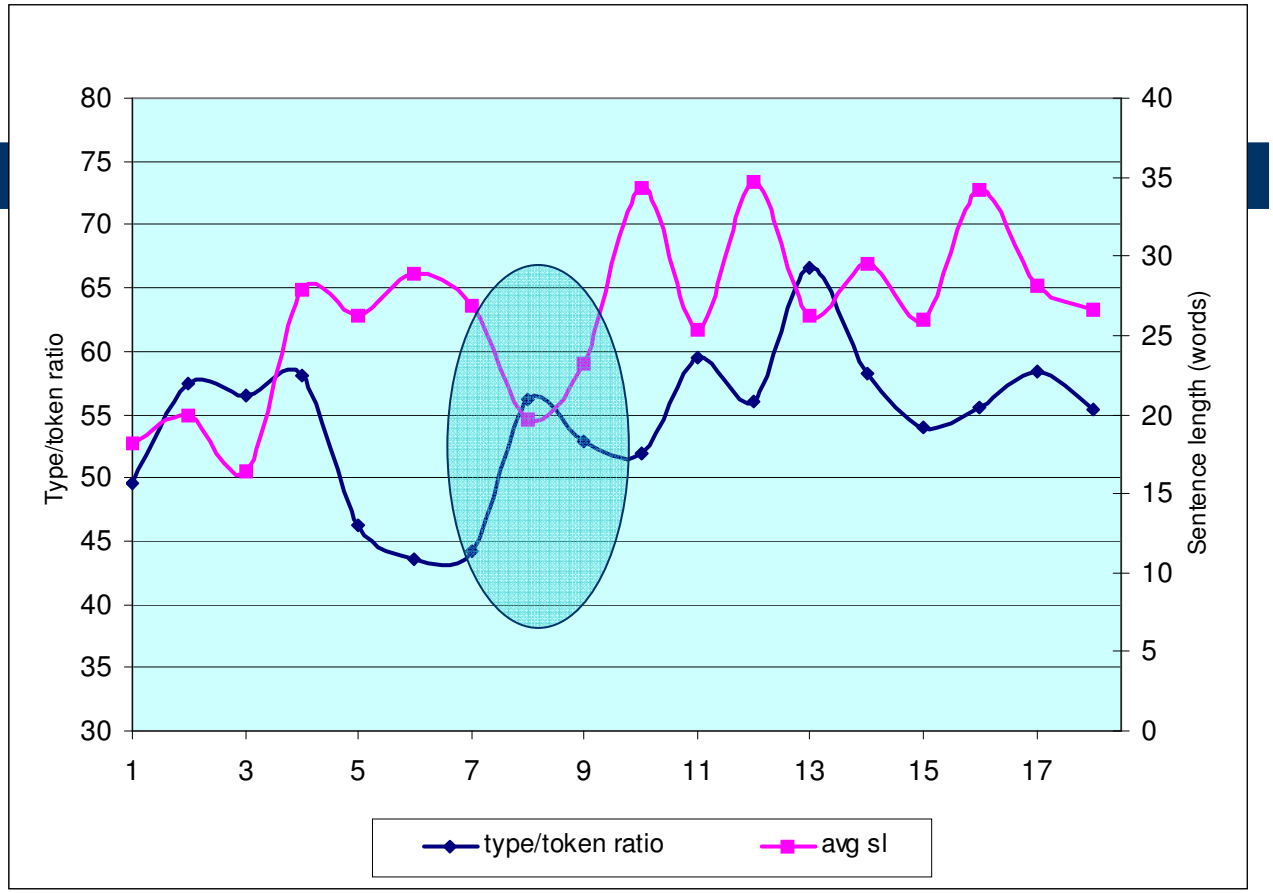
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type/token ratio
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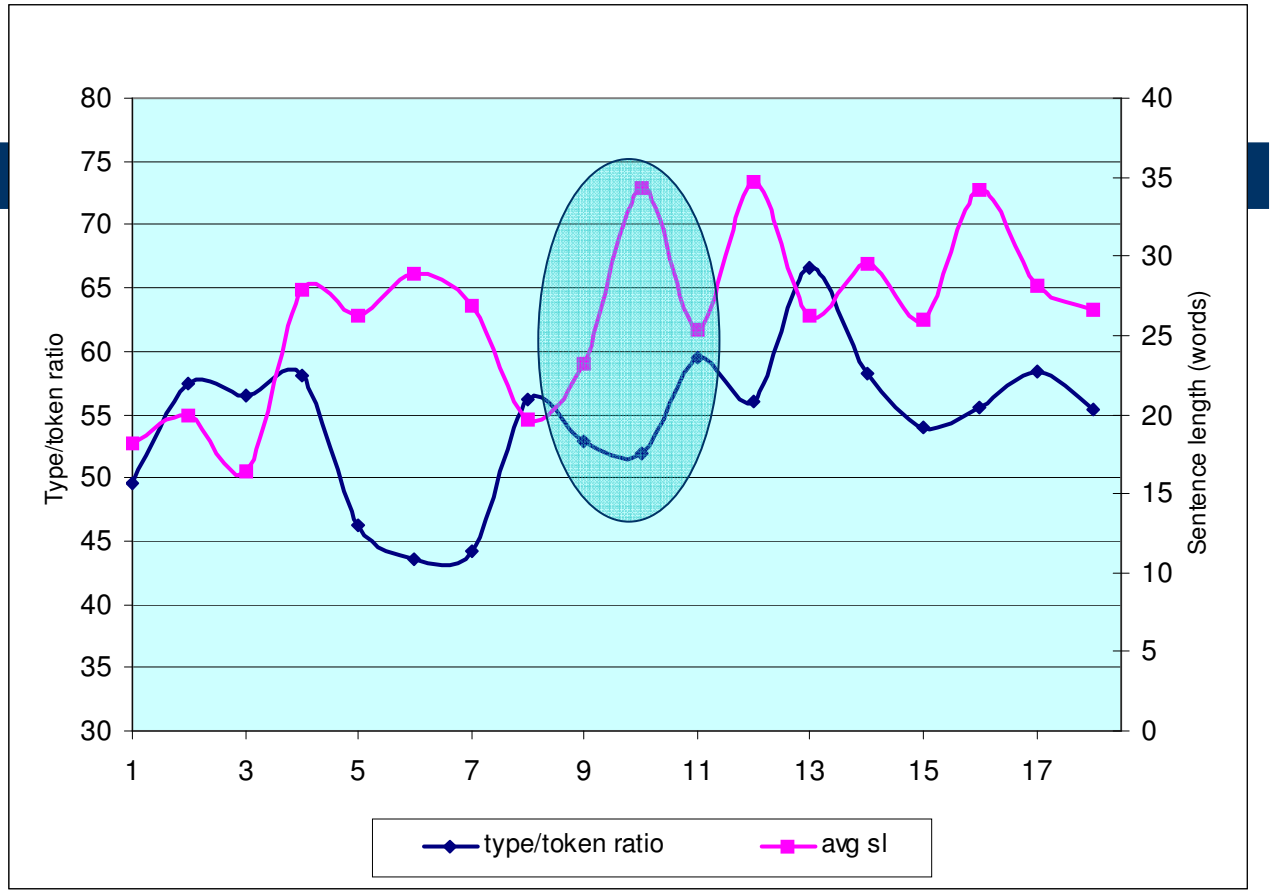
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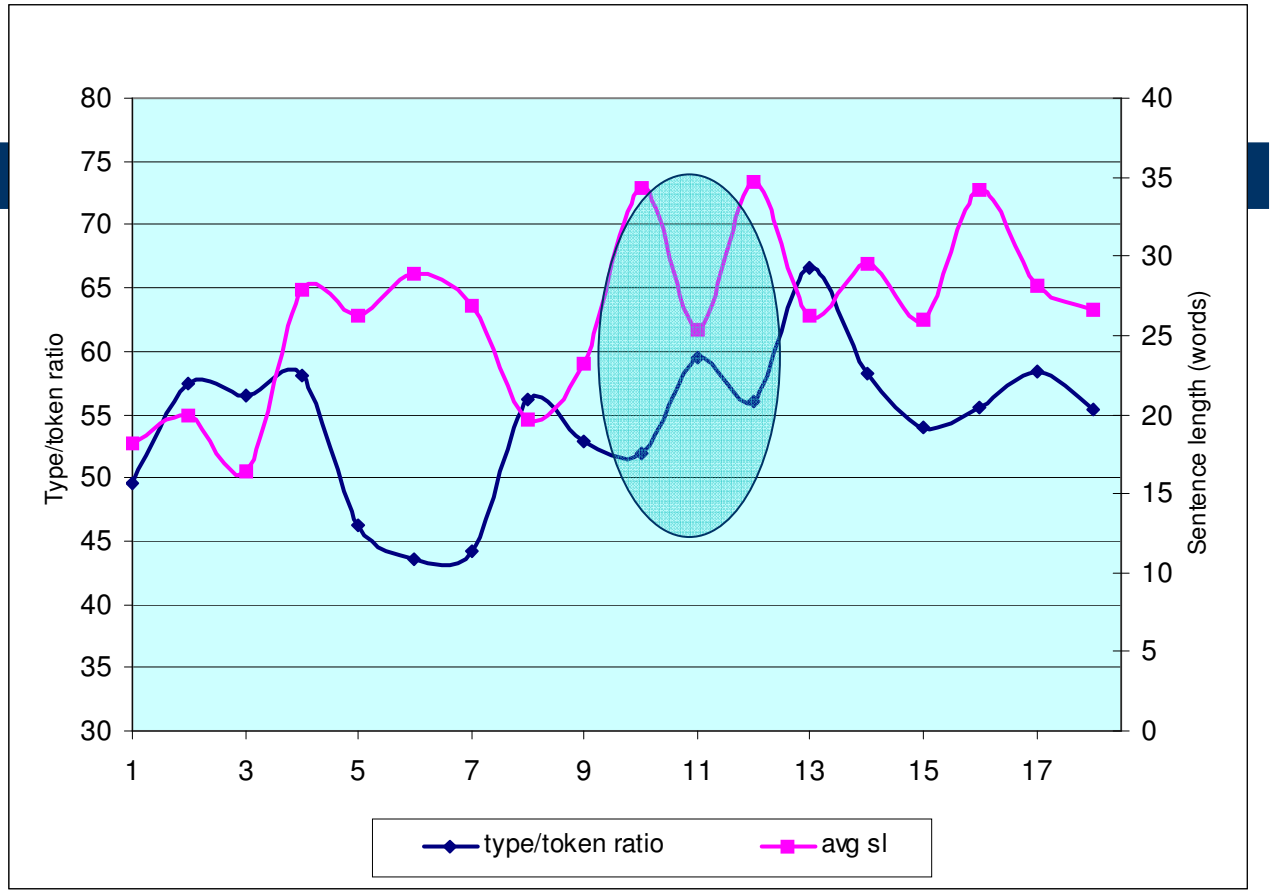
type/token ratio
avg sl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Sentence length (words)
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type/token ratio
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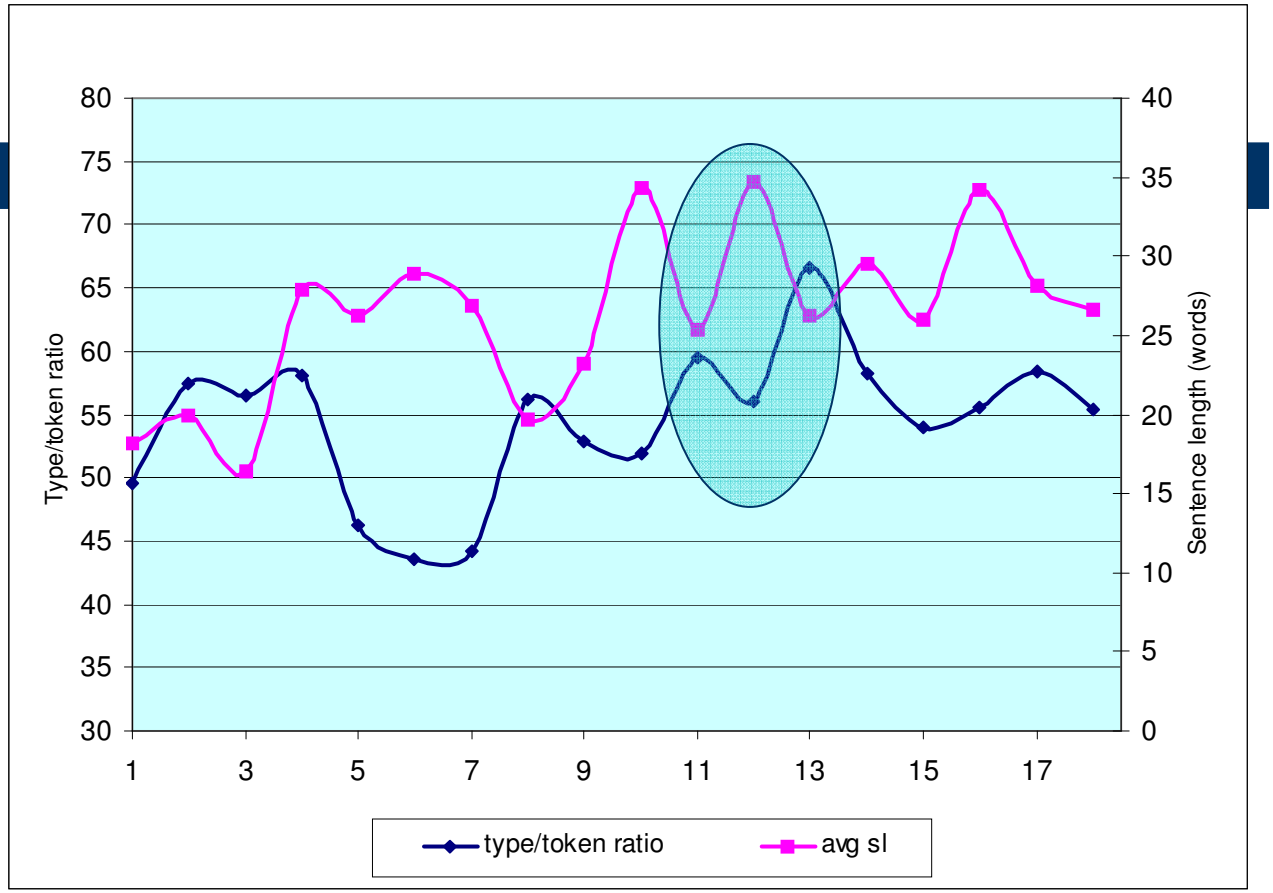
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Sentence length (words)
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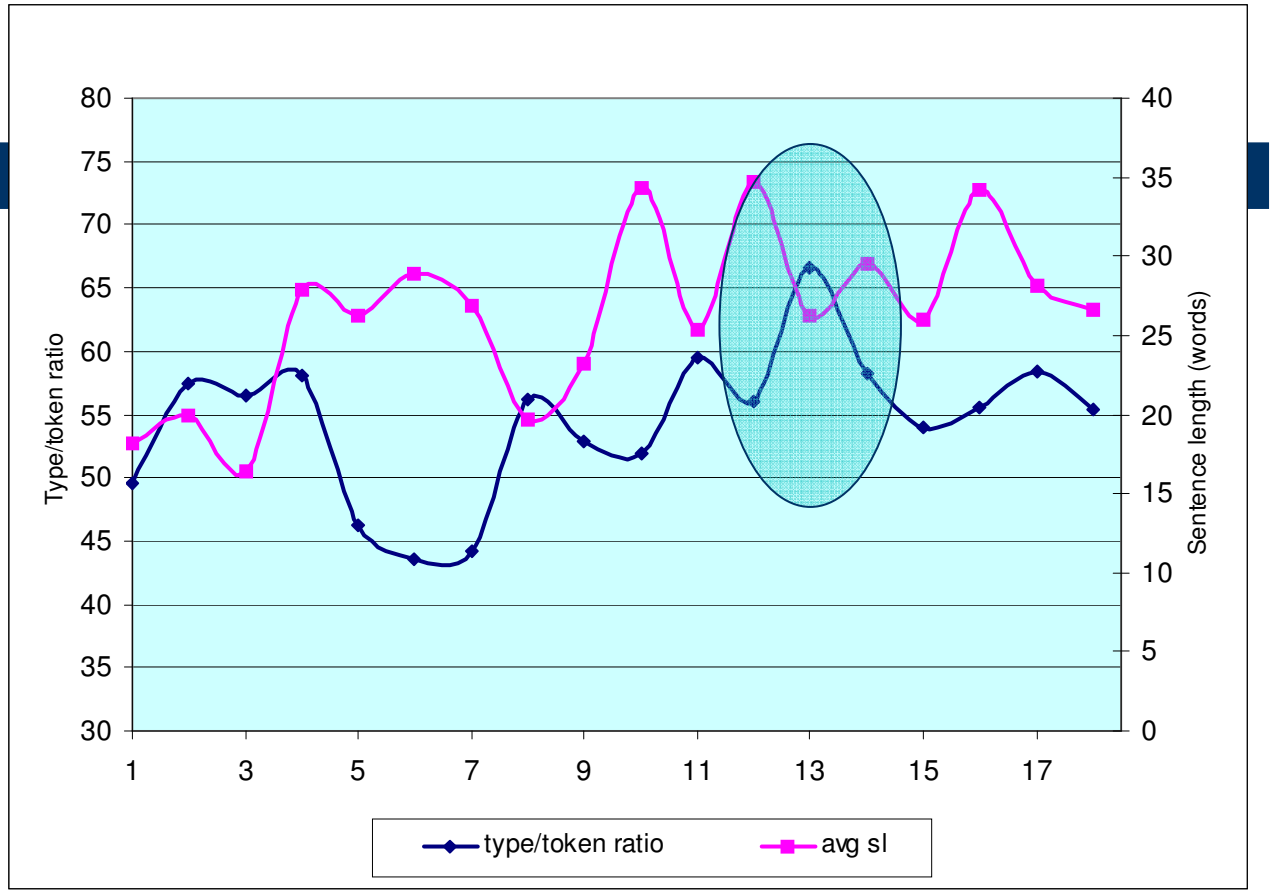
type/token ratio
avg sl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Type/token ratio
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Sentence length (words)
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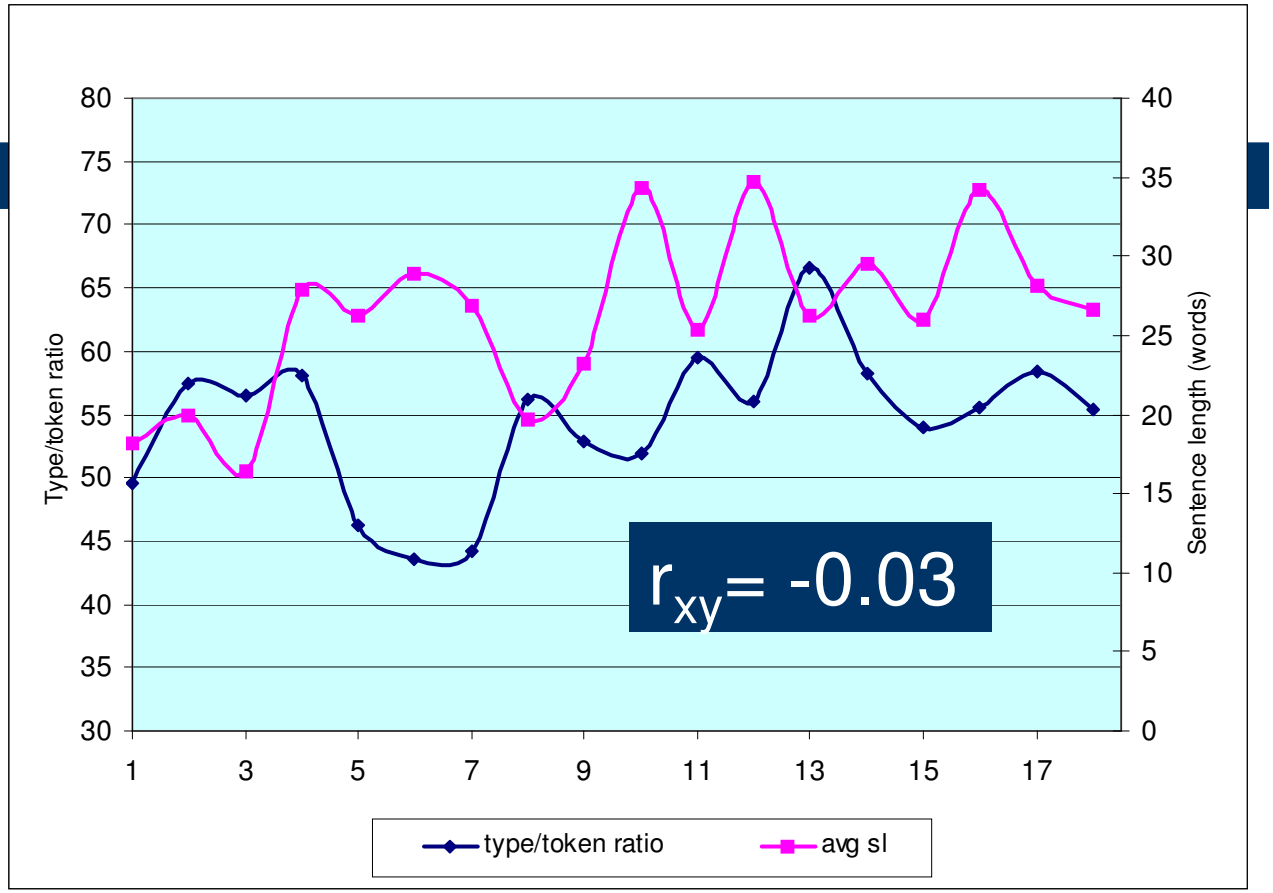
type/token ratio
avg sl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Type/token ratio
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Sentence length (words)
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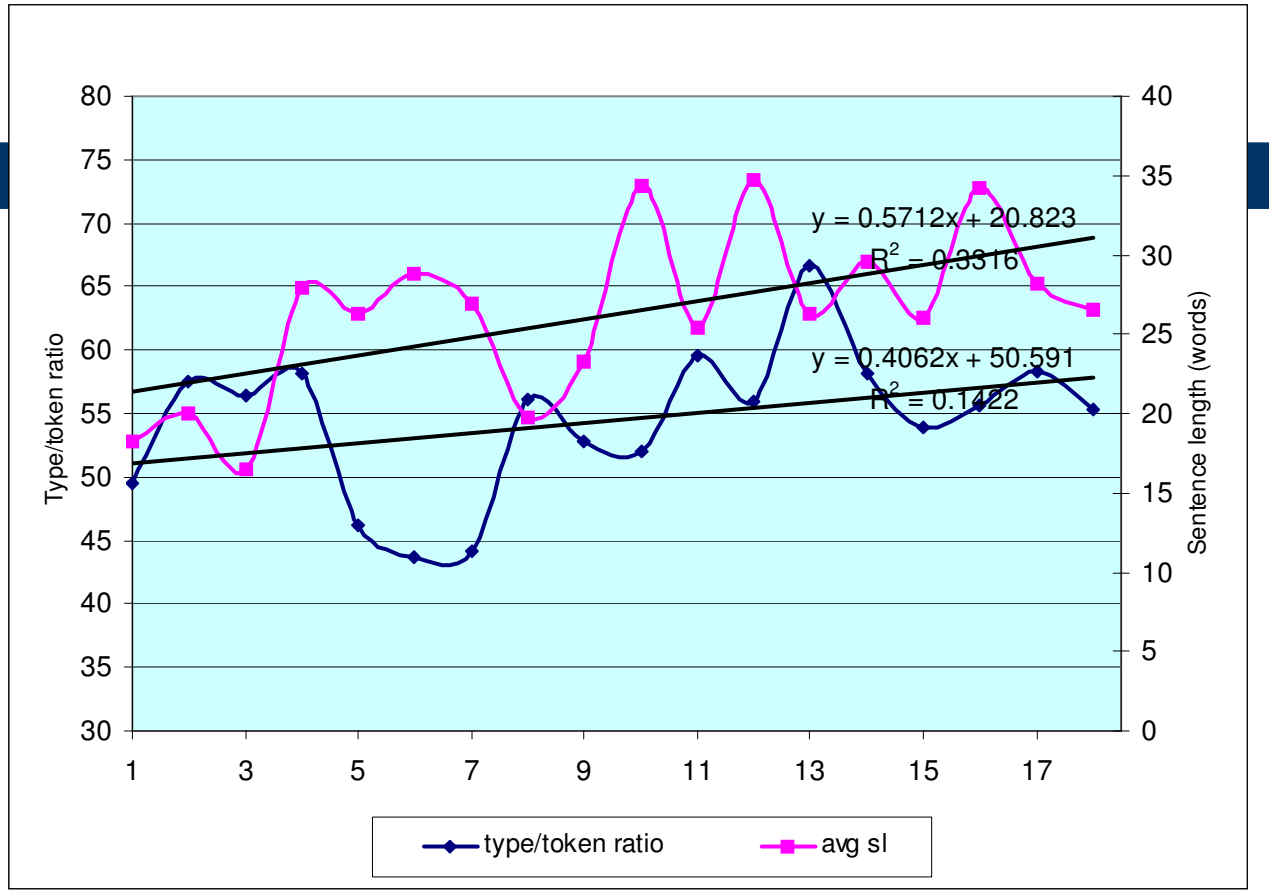
r_{xy}= -0.03
type/token ratio
avg sl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Sentence length (words)
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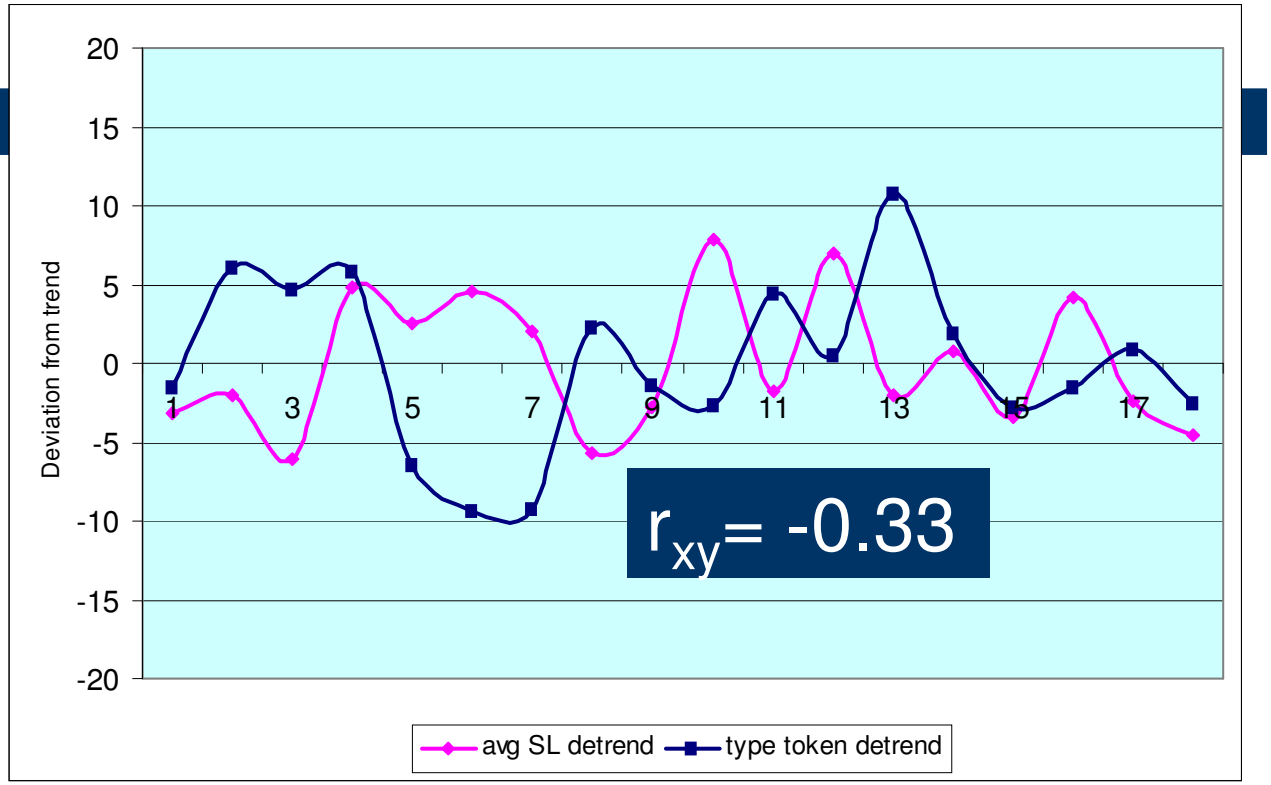
y = 0.5712x + 20.823
R2 = 0.3316
y = 0.4062x + 50.591
R2 = 0.1422
type/token ratio
avg sl


20
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-5
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Deviation from trend
1
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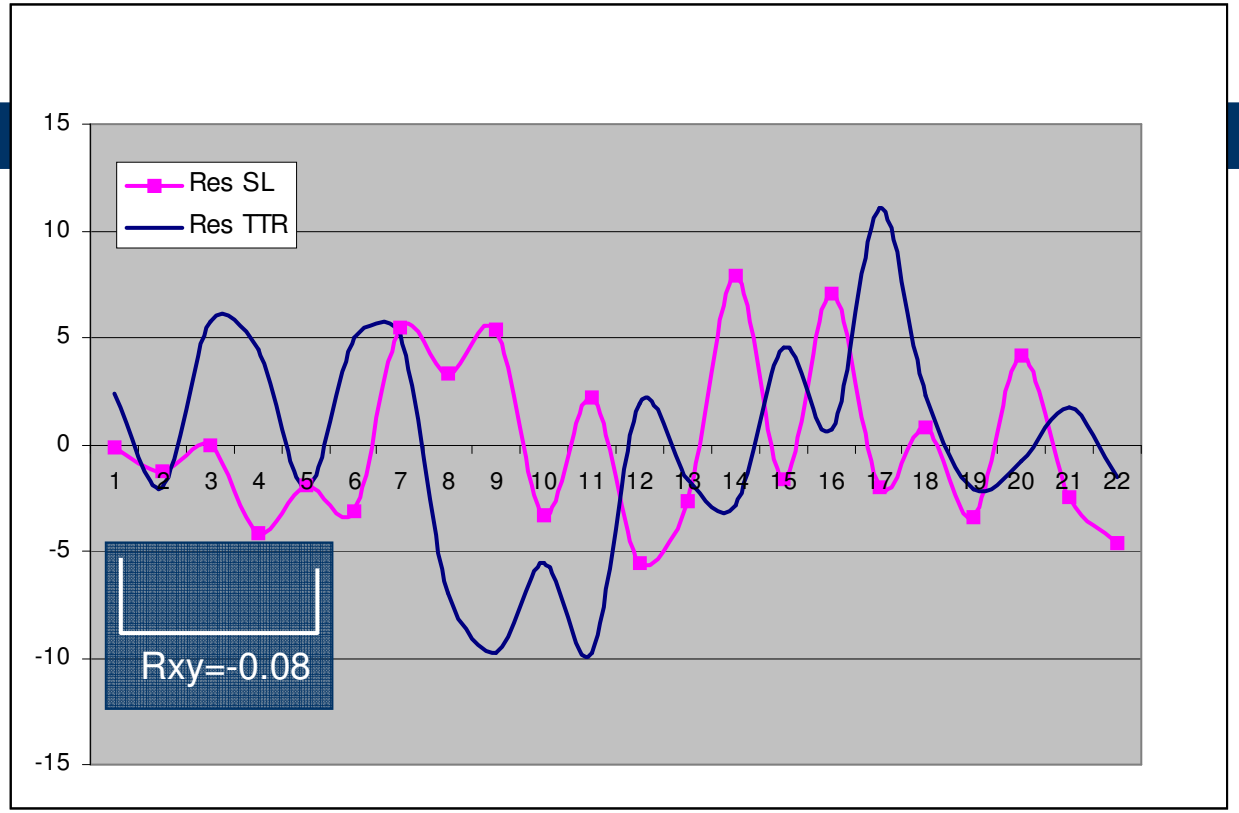
r_{xy}= -0.33
avg SL detrend
type token detrend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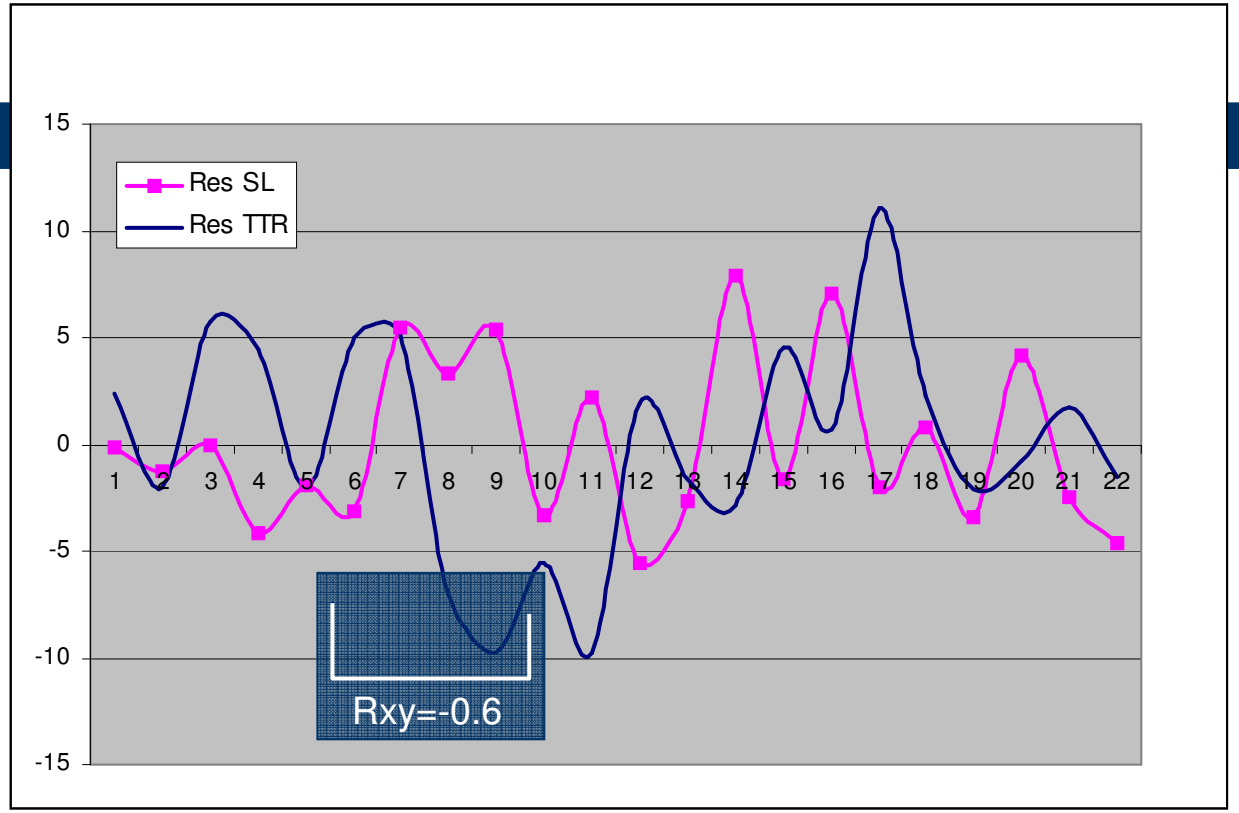
Res SL
Res TTR
Rxy=-0.08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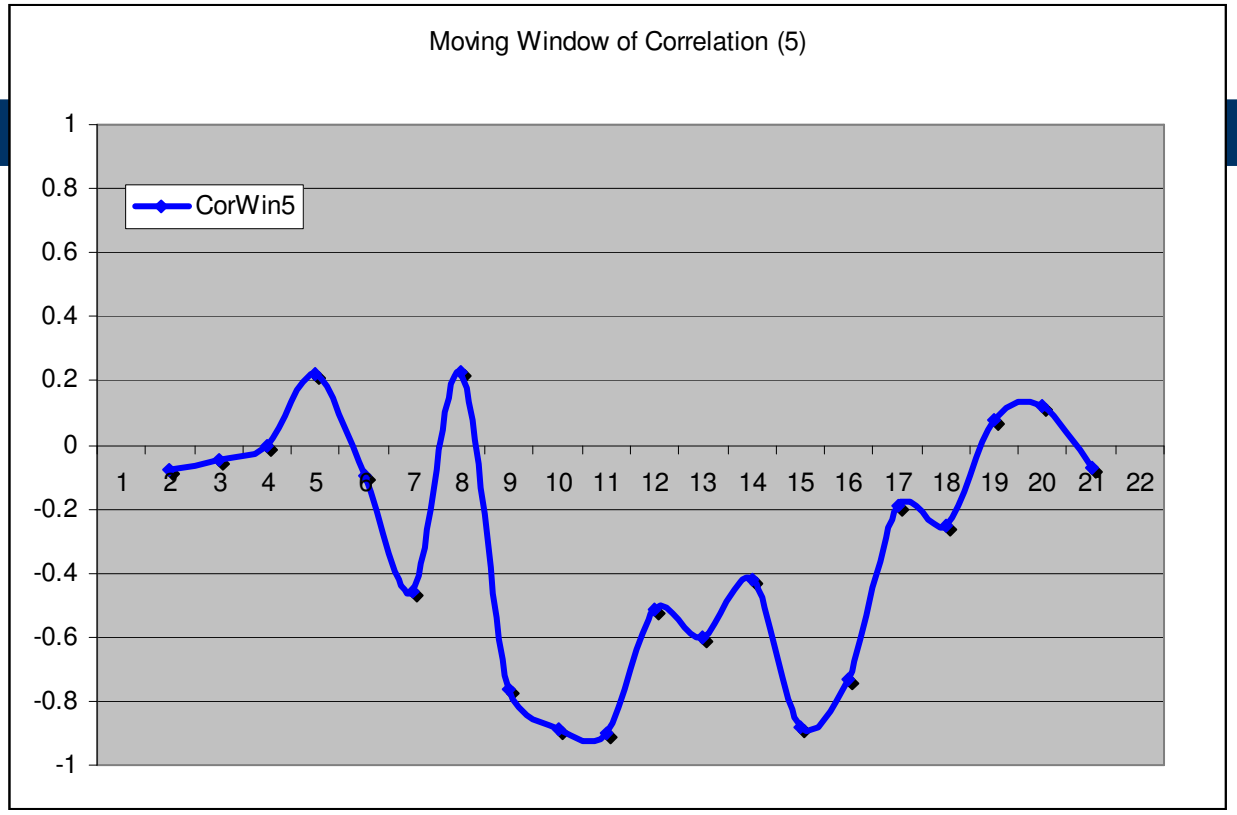
Res SL
Res TTR
Rxy=-0.6


Moving Window of Correlation (5)
CorWin5
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

Results

- Increase of all factors over time
  - Fluency
    - word length, sentence length, TTR, academic vocabulary
  - Complexity
    - Dependent clauses*, noun phrase length, finite verb ratio
- Great degree of variation in all factors
- Interaction
  - TTR-sentence length
  - Noun phrase length–finite verb ratio
  - Academic vocabulary-finite verb ratio
  - Dependent clauses-finite verb ratio

A dynamic perspective on (academic English) L2 lexical development

Is a dynamic model applicable to L2 (academic English) vocabulary development?

[related studies: Laufer 1998; Laufer & Paribakht 1998; Meara 2005]

Why vocabulary?

Largest area of L knowledge & subject to most change (Meara & Rodriguez Sanchez, 1993; Schmitt & Meara, 1997)

Grows over time to an end point (e.g. Aitchson 1994)*

L1 vocabulary: slow-rapid-slow model (van Geert, 1991 on basis of Dromi, 1981)

L2 vocabulary (real data & simulations) fluctuates even over short periods (Schmitt & Meara, 1997).

Comprised of interconnected knowledge levels

Correlates with other proficiency measures (cf Nation 1990; Laufer & Nation 1995; Qian 1999; Zareva et al 2005)

Academic English lexical knowledge from a DST perspective

Focus: academic vocabulary

[sampled from UWL (Xue & Nation 1984) /AWL (Coxhead 2000)]*

- Why academic English vocabulary?

1) Limited in scope
2) Limited in contact
3) Distributed across frequencies

Disclaimer:

There exists no perfect measure of vocabulary use and knowledge

(Laufer, 2005)

The lexical knowledge paradigm

Focus: development of and relations between levels of knowledge in 2 dimensions :

1) *Production*:

FREE vs. CONTROLLED

2) *Strength of word knowledge*:

RECALL vs. RECOGNITION

Longitudinal Academic Vocabulary Test (LAVT) Design

1) Controlled production + (free production)
2) Active recall + 3) Active recognition*

30 items in each part, randomly generated from database.

Scoring: in each part, correct/total item ratio represents academic vocabulary knowledge percentage.

Examples….

Part 1 – Controlled Production

(adapted from *PVLT*, Laufer & Nation 1995)*

using completion items [gap fill] (paired with FREE production / written corpora)

Example: Mexican farm workers m_____ into the US each year to find work at harvest time.; In September, these birds m_____ 2,000 miles south to a warmer climate.

Part 2 - Active Recall

(adapted from CATSS, Laufer et al 2004)

Example: correct and without any mistakes;

precise a_____

(definitions taken from Cambridge Advanced Learner's dictionary http://dictionary.cambridge.org/)

Part 3 - Active Recognition

(adapted from CATSS, Laufer et al 2004)

(1)* closely connected to or related to a group or organization

a) affiliated b) adjacent

c) abbreviated d) antiquated

(2)** improve the quality of something by adding something else

a) entail b) enrich

c) entrust d) enrage

Words taken from Kilgariff's lemmatized BNC lists (frequency and alpha), on
http://www.kilgarriff.co.uk/BNC_lists/lemma.num &
http://www.kilgarriff.co.uk/BNC_lists/lemma.al

Problems/solutions

- Practice effects: each part randomly generated item database

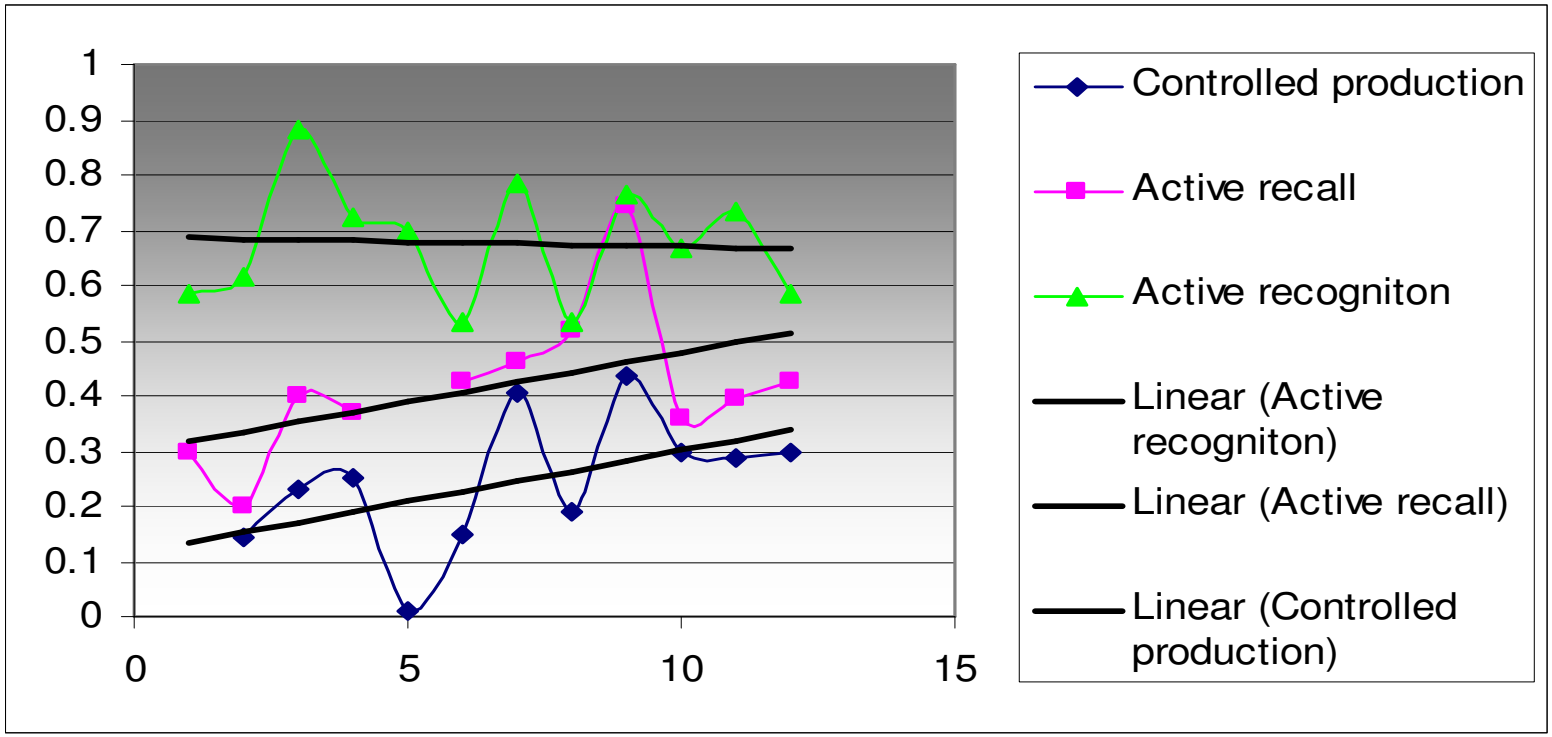
- Equivalent forms reliability:

Pearson's *r* coefficient ($p<0.01$):

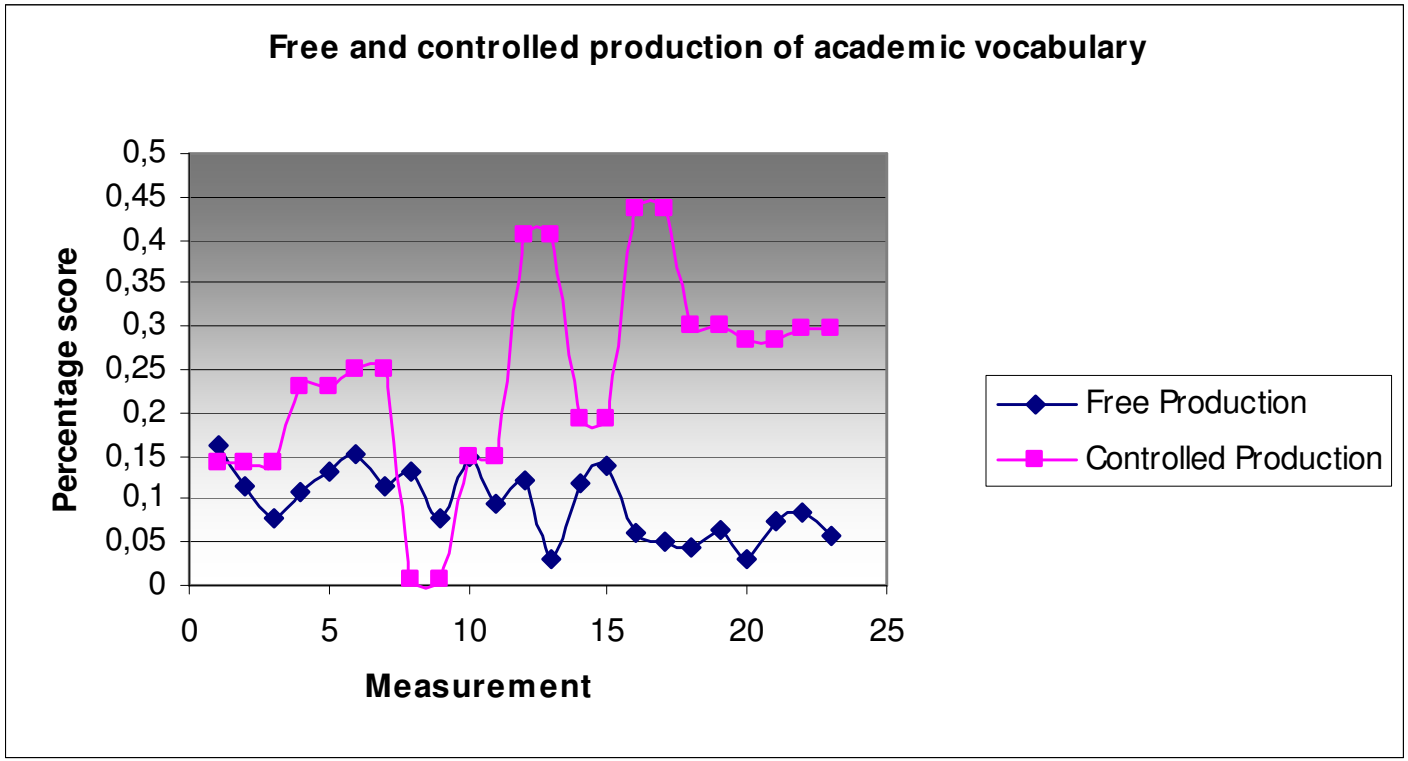
1) Controlled production: (0,775; n = 27)
2) Active recall: (0,844; n = 32)
3) Active recognition: (0,733; n = 31)

- Ambiguous cues: piloted definitions, additional letters as prompts when necessary, scoring adjustment *

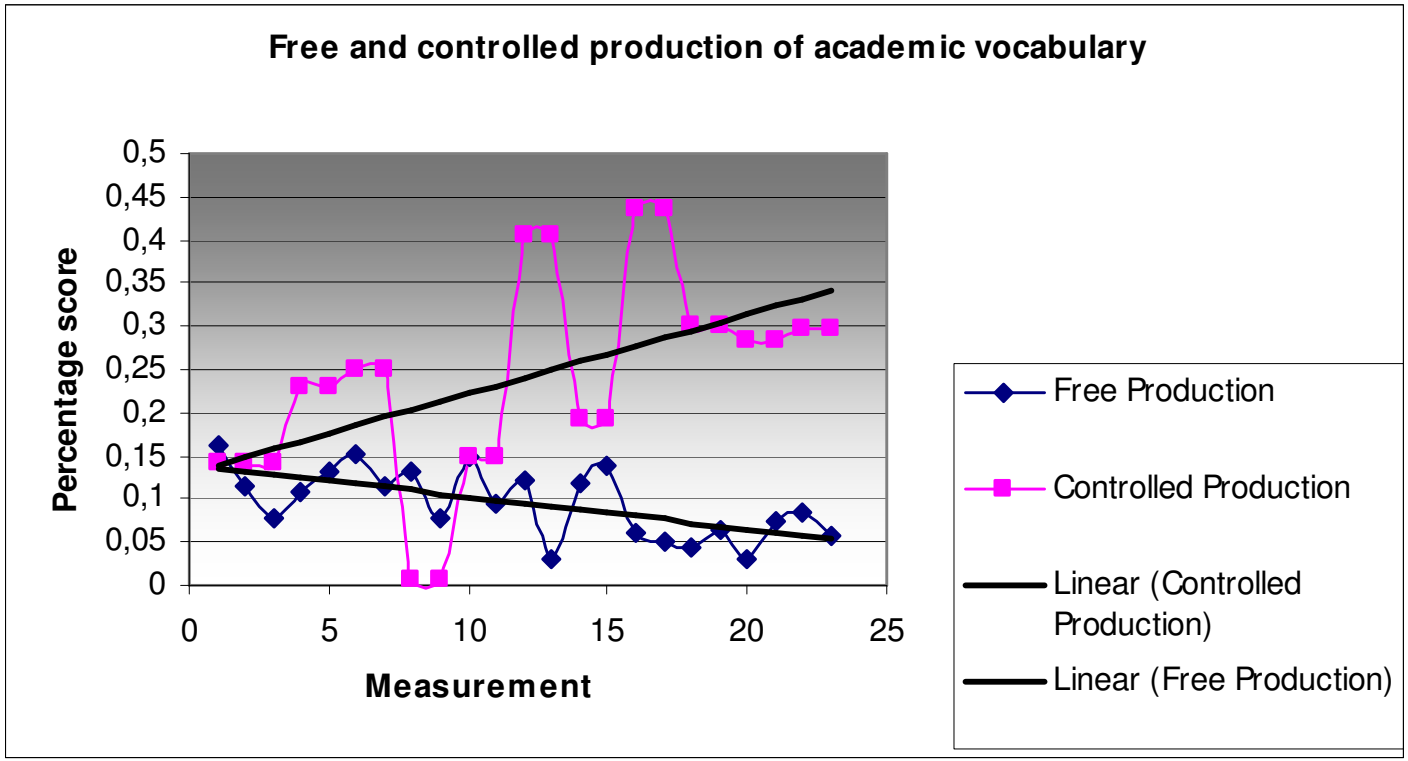
LAVT results example: Mandarin L1 M.A. student



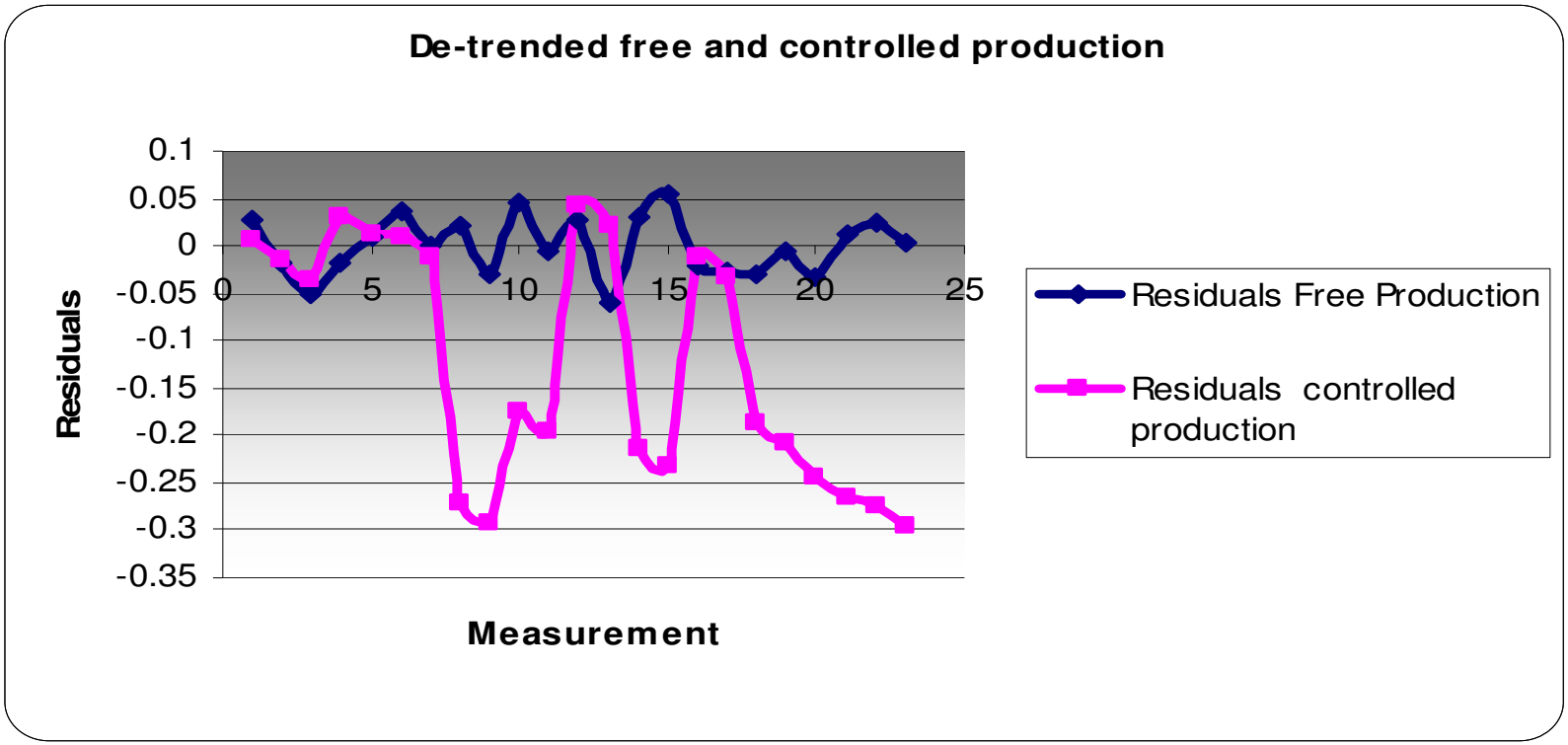
1. Free & controlled production



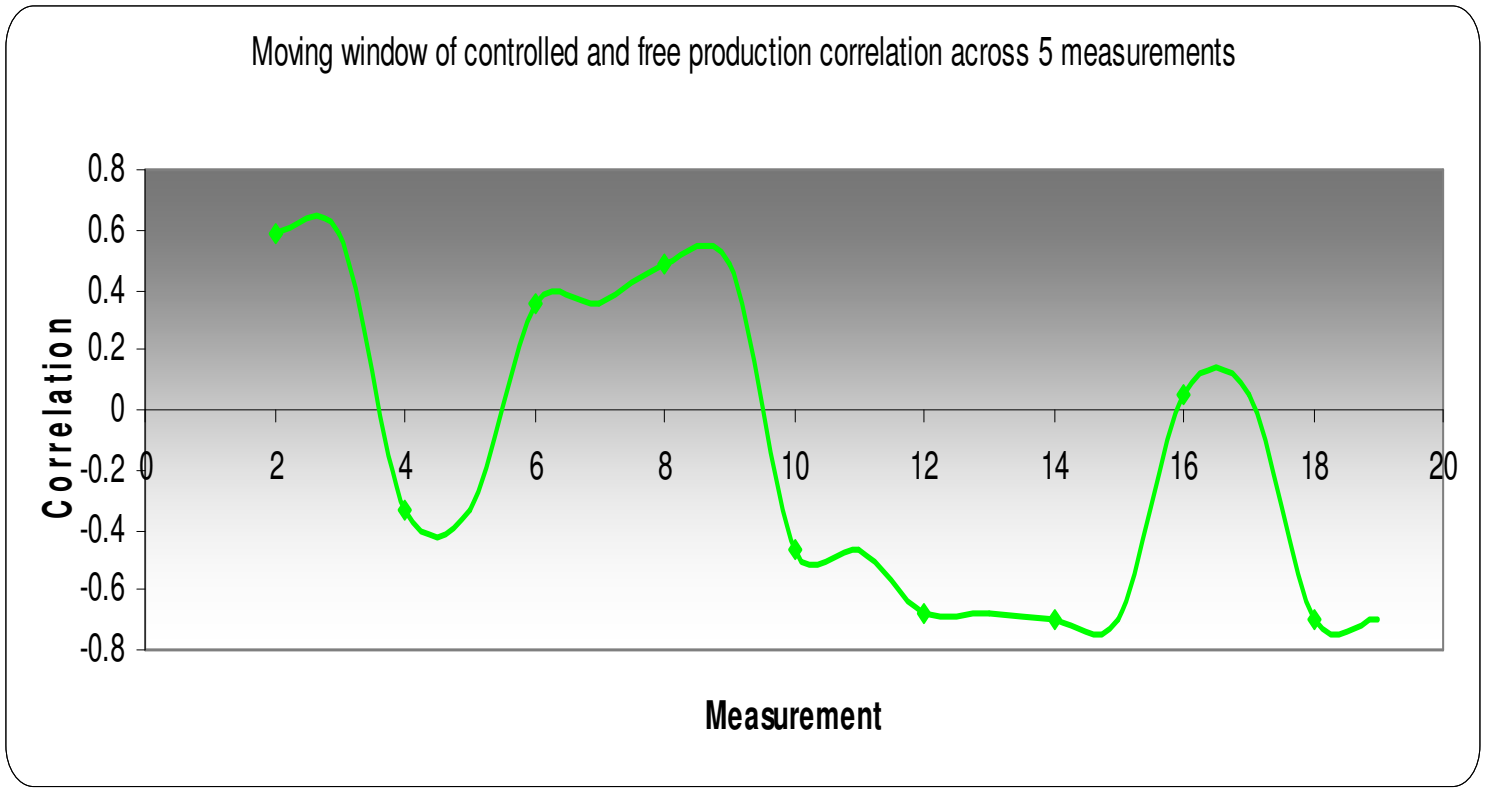
Free & controlled production - developmental trend



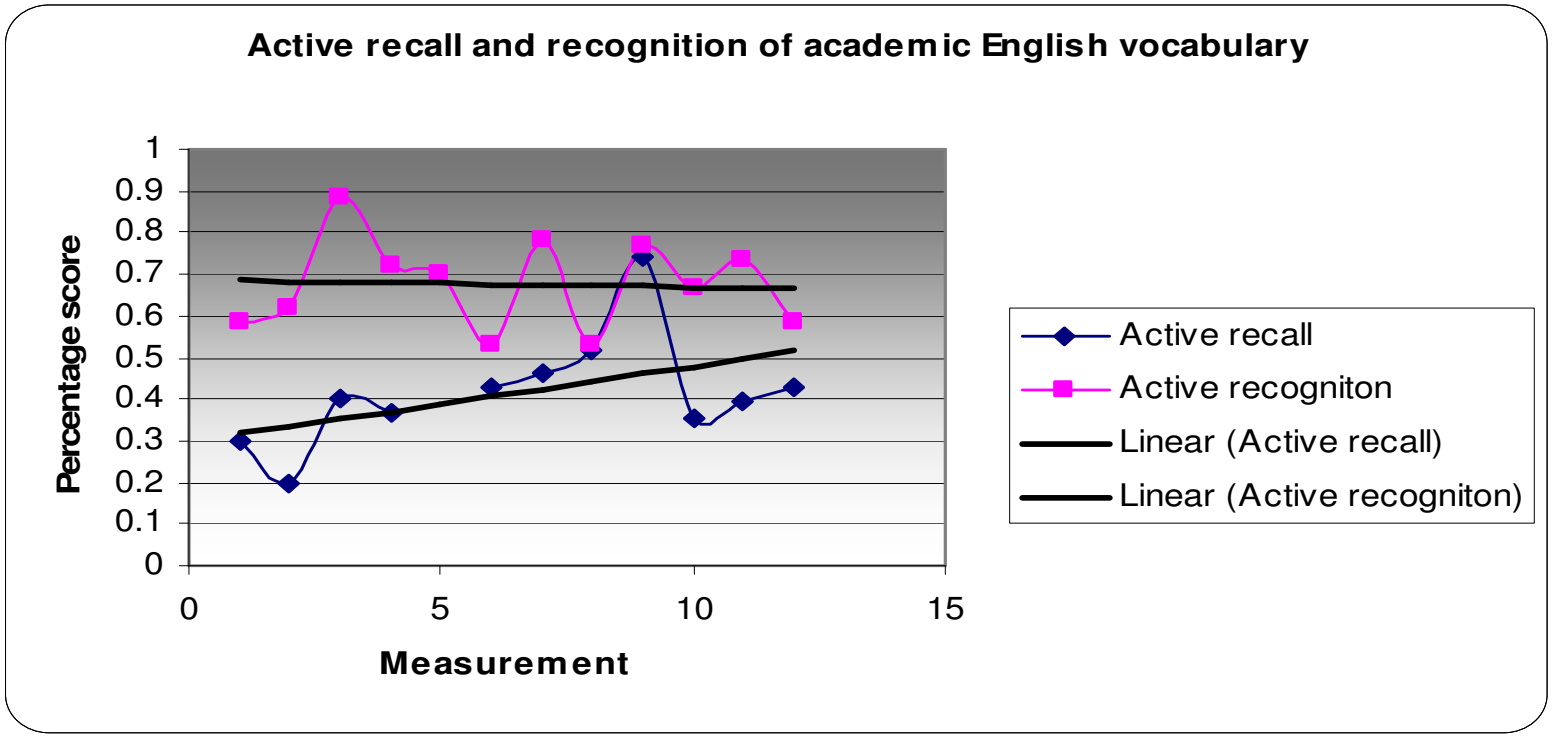
De-trended free & controlled production



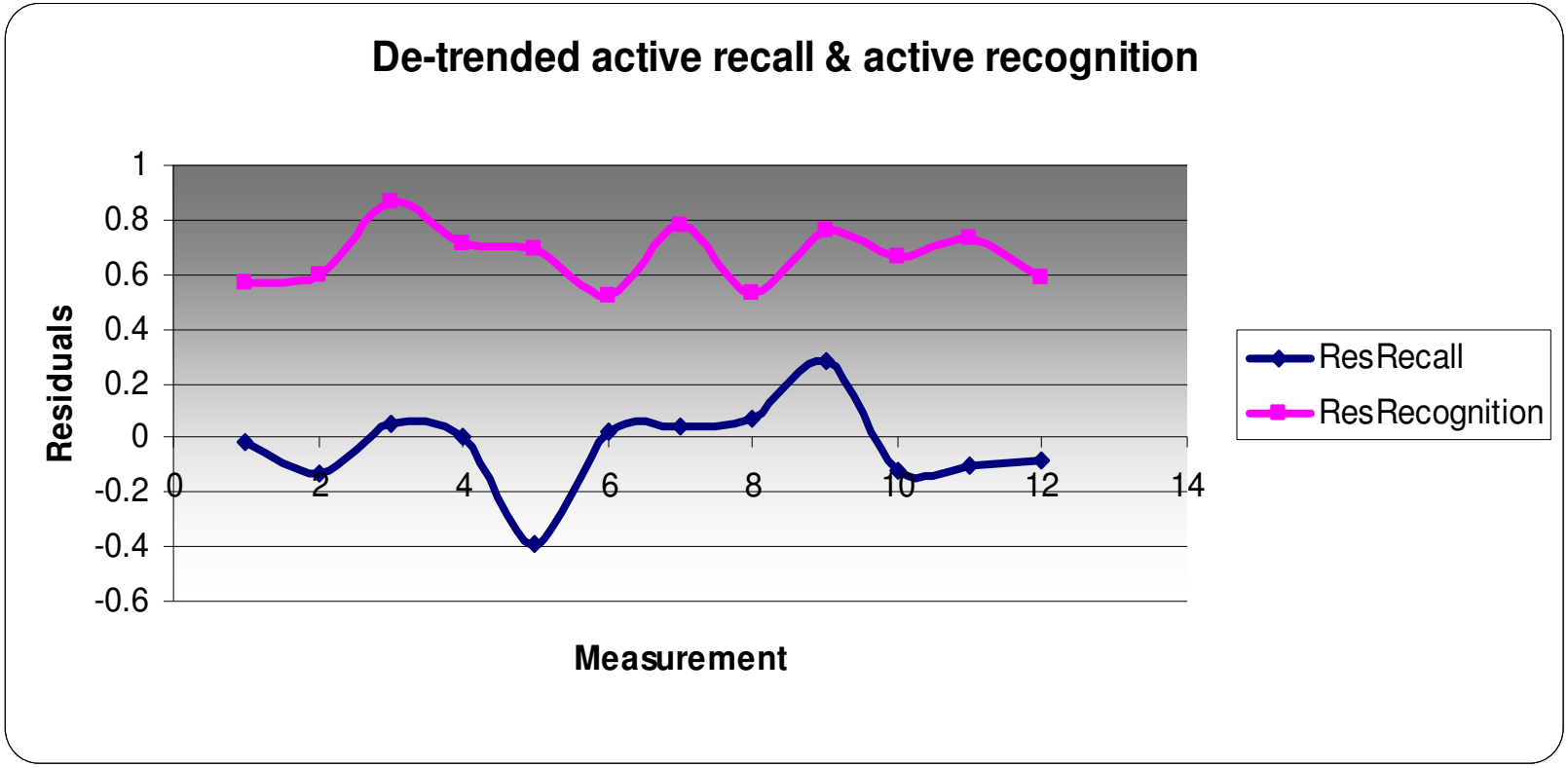
Free-controlled production correlation



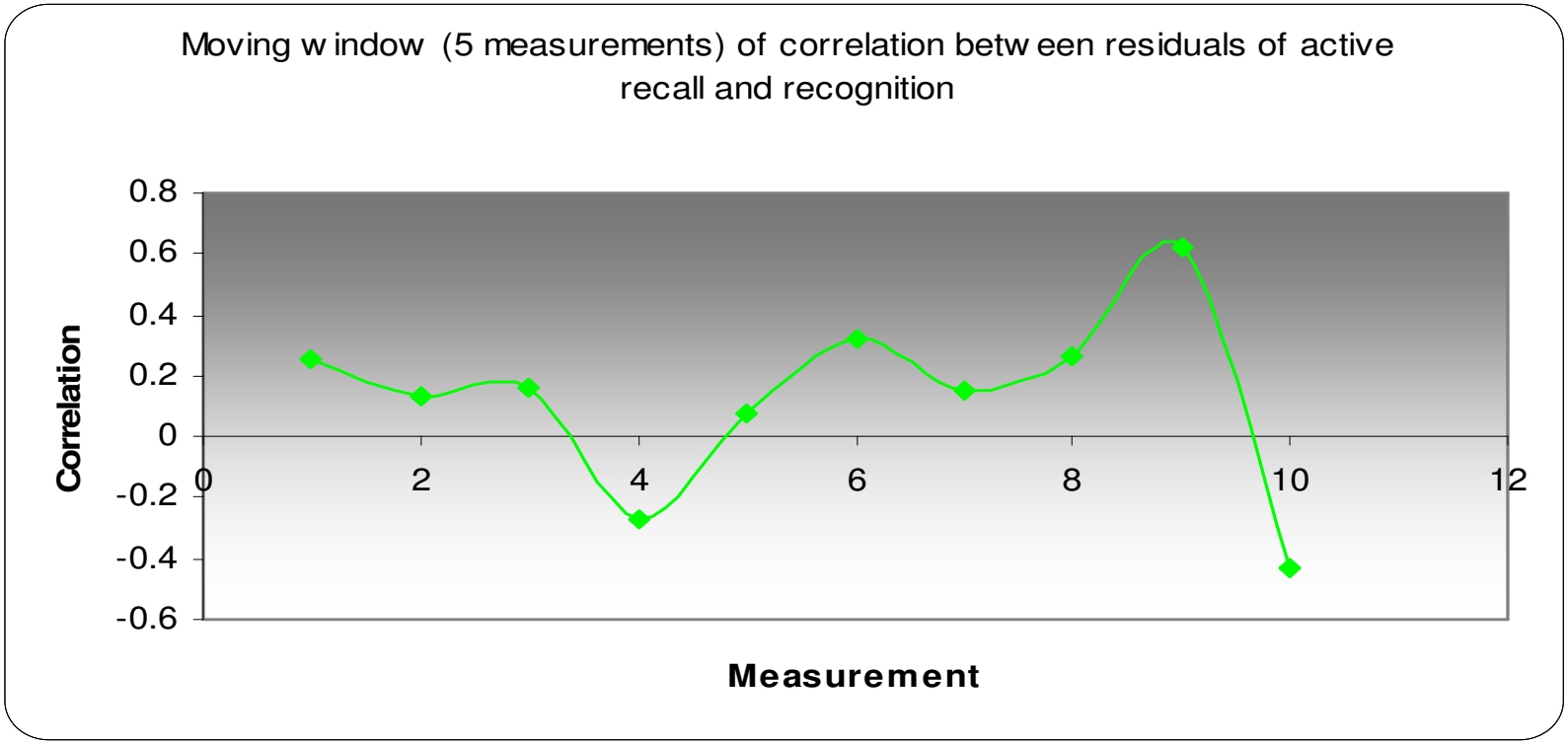
2. Active recall & active recognition – same participant



De-trended recall & recognition data



Active recall-recognition correlation



Discussion

- Increase entails variation
- Increase on one level entails decrease on another*
- Possible explanation: competition for resources; acquisition-maintenance balance
  (Herdina & Jessner 2002)

Summary

Research: a DST perspective on (academic) vocabulary knowledge development, focusing on developmental variation and interactions between levels can explain changes in knowledge types and their relations over time

Practical value: expectations from learners, holistic view of L2 development.

Possible directions…

- Different proficiencies & L backgrounds
- Different learning durations, contexts
- Explore dynamics of other lexical knowledge (such as idioms, associations, passive recall & recognition, metacognitive knowledge, collocation and other errors) &/or writing aspects
- Other L2 writing types

Thank you!

Comments? Questions?

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