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Vakdidactiek
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Learning before you know it!

second language development as a complex dynamic system

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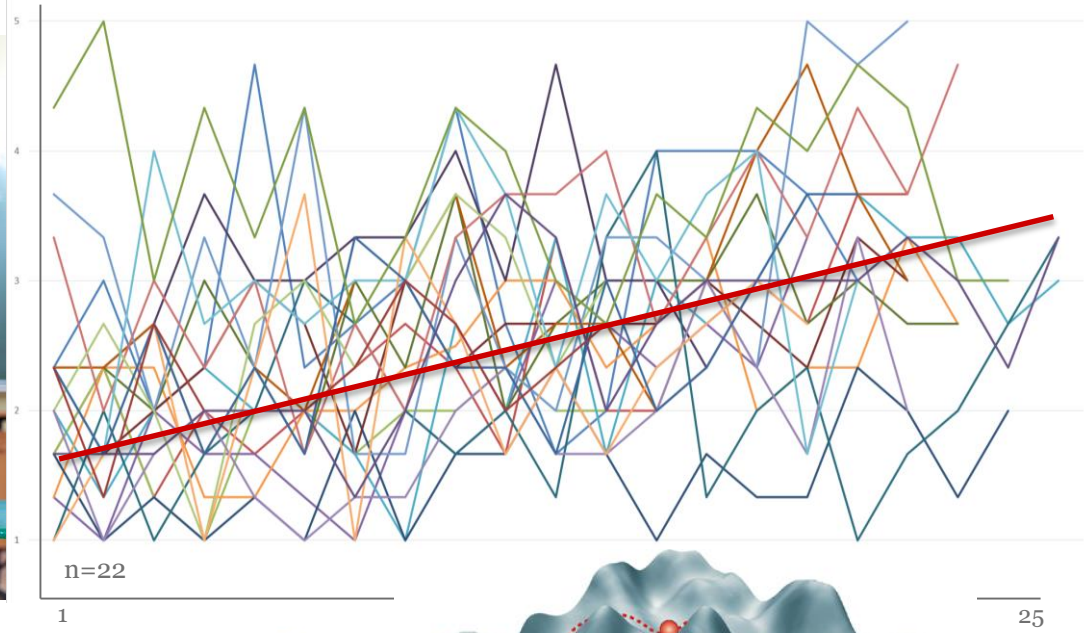
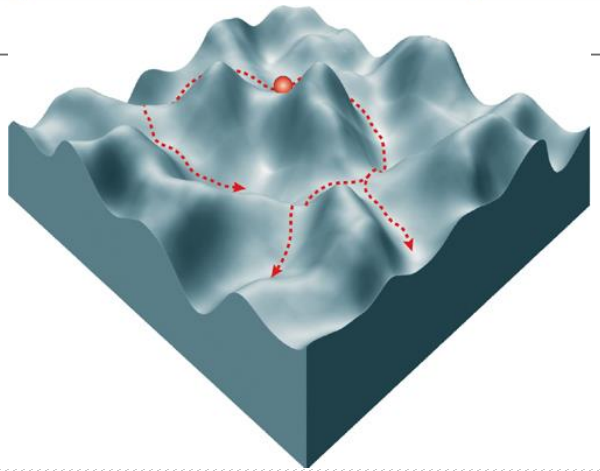


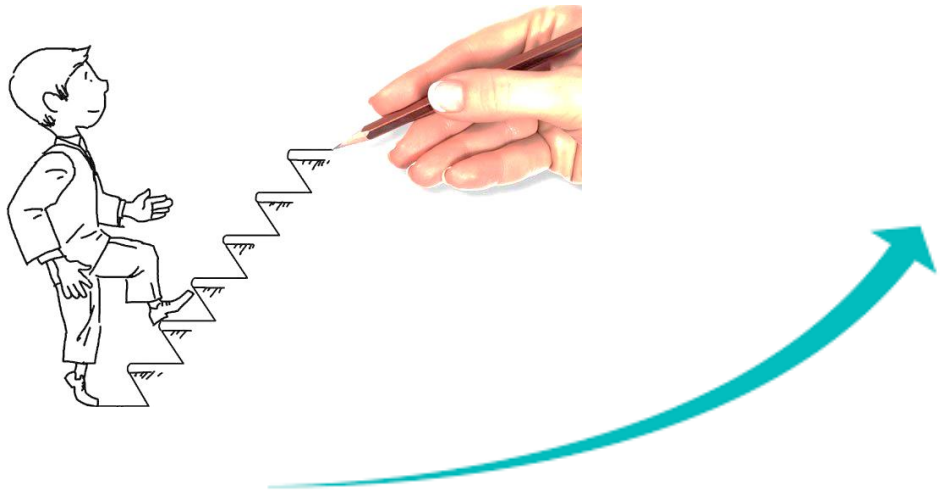


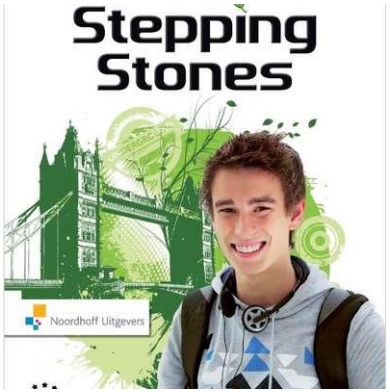
The trajectory of this talk

- Implicit assumptions
- Data of second language development
  - Some observations
- Second Language Development: an integrated dynamic approach

Assumption 1

› (Second) language learning consists of predetermined stages

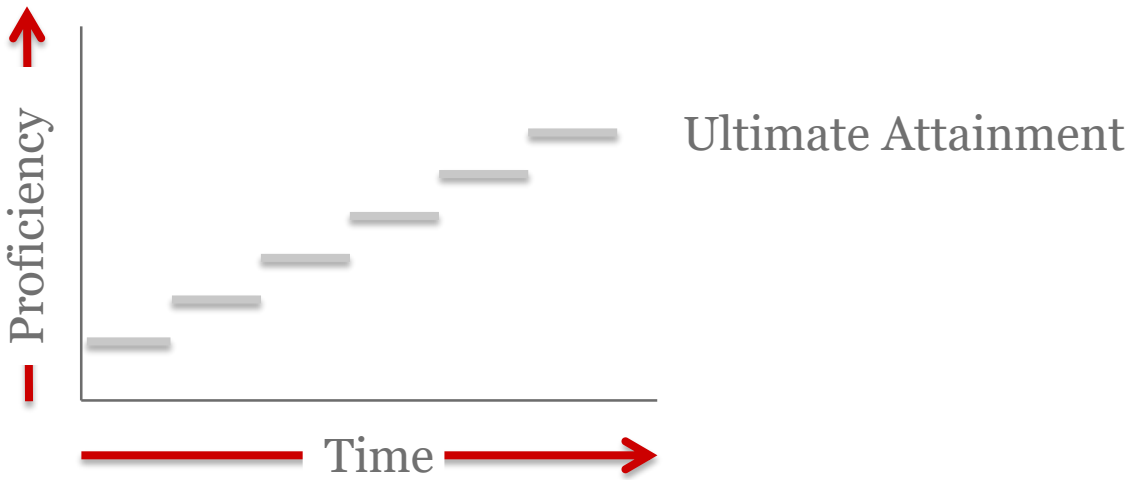




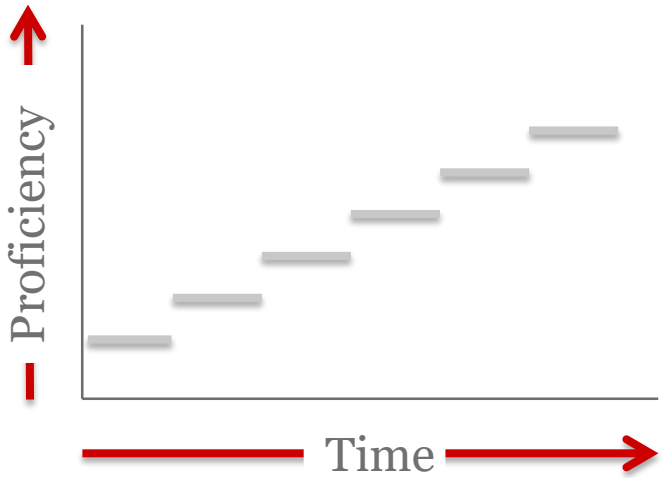
Language learning = predetermined

- Language learning = fixed order

(Second) language development

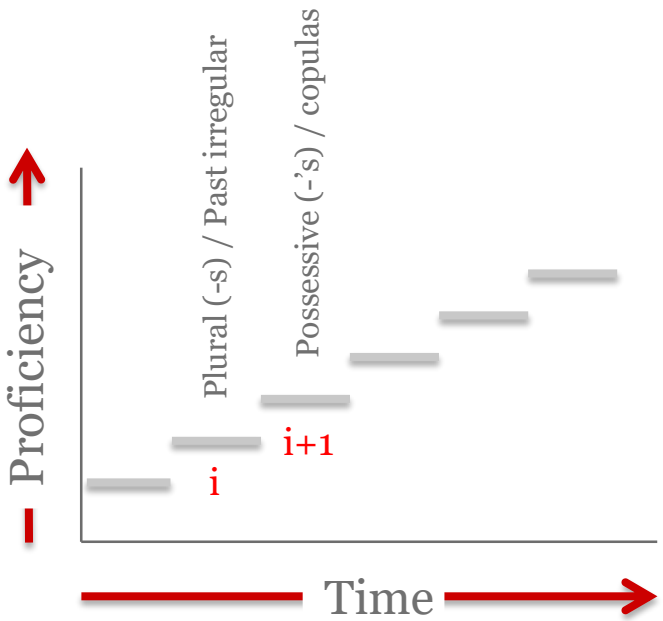


(Second) language development



Rank	Morpheme
1	Present progressive (*-ing*)
2/3	*in, on*
4	Plural (*-s*)
5	Past irregular
6	Possessive (*-'s*)
7	Uncontractible copula (*is, am, are*)
8	Articles (*a, the*)
9	Past regular (*-ed*)
10	Third person singular (*-s*)
11	Third person irregular
12	Uncontractible auxiliary (*is, am, are*)
13	Contractible copula
14	Contractible auxiliary

(Second) language teaching

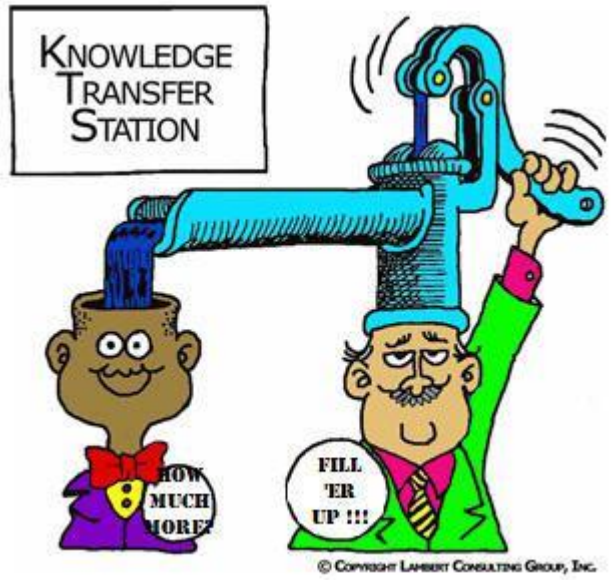


Assumption 2

› Language learning benefits from *explaining* the forms or structures, practicing these and testing them

Learning: Information Processing

https://leonidesignoryblog.com/1042-2/



https://yulvartan.wordpress.com/tag/knowledge-transfer/

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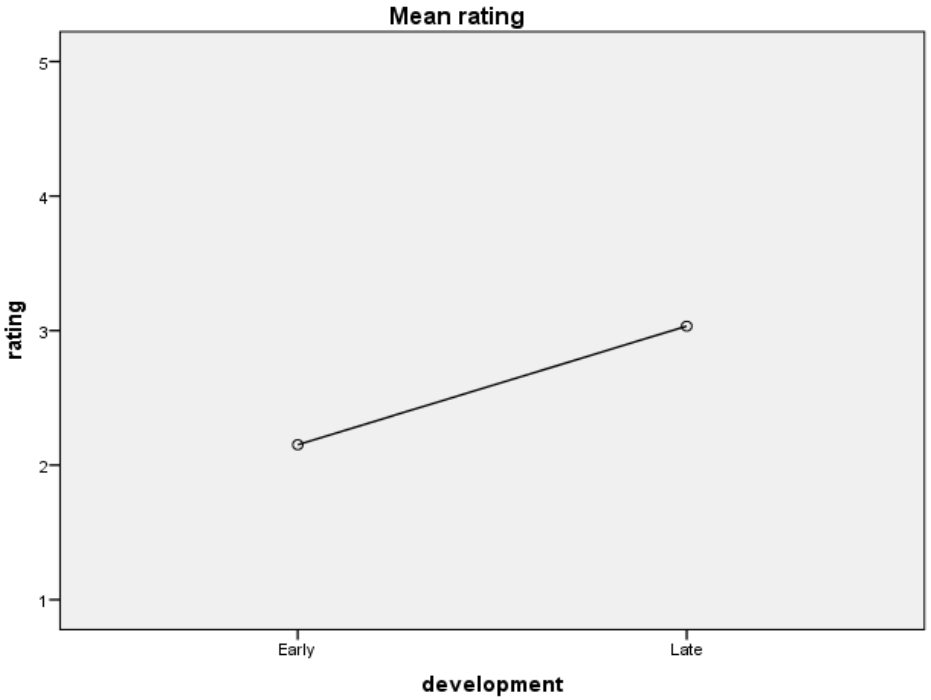
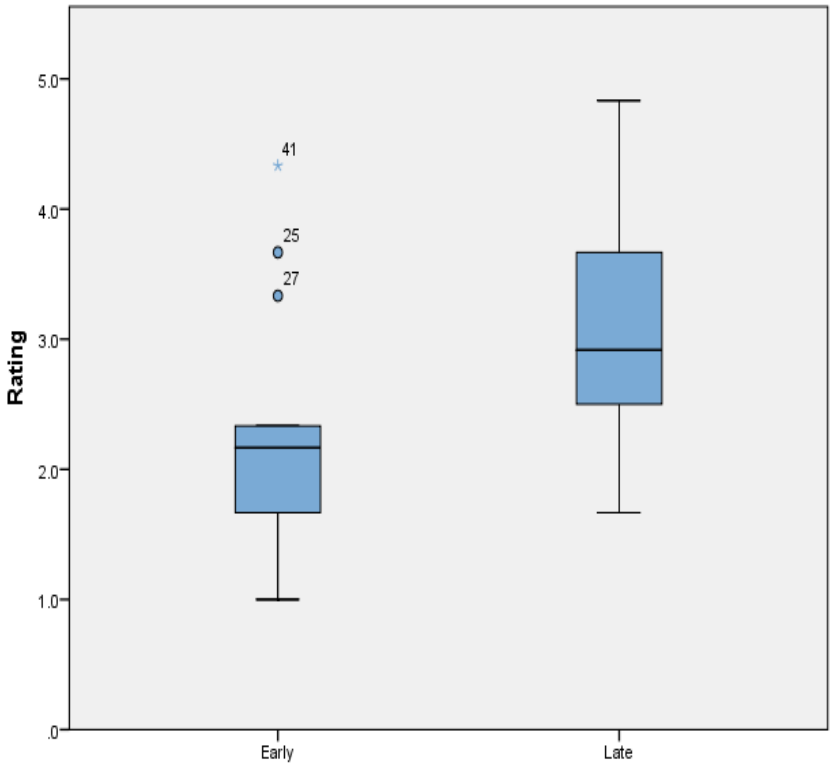
Data example 1: *development* in L2 writing

- 22 Dutch L2 learners of English
- 12-13 years old
- Similar scholastic ability
- Same bilingual school experiences
- Similar input

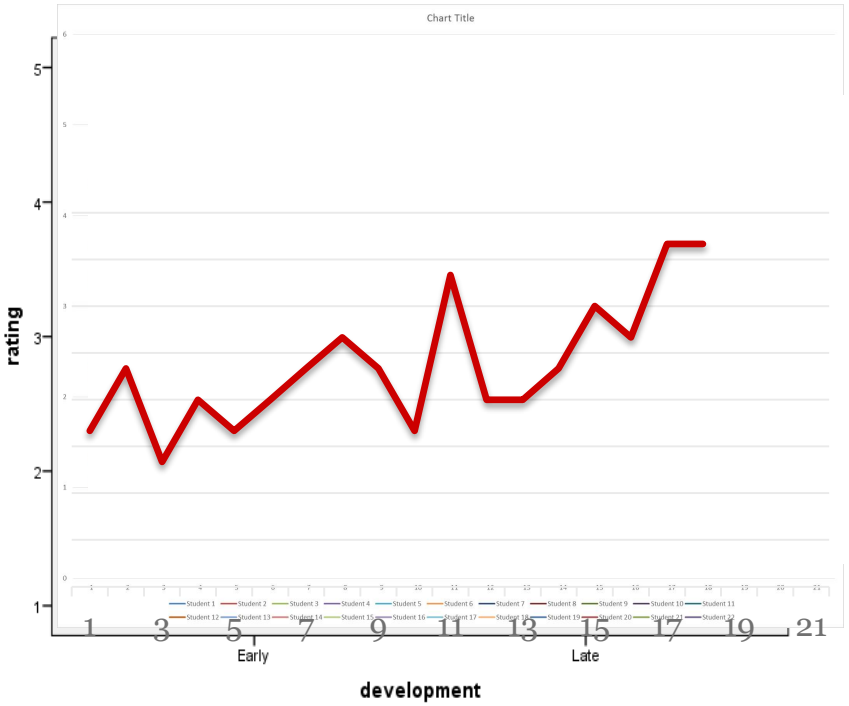
Holistic scores (mean rating)

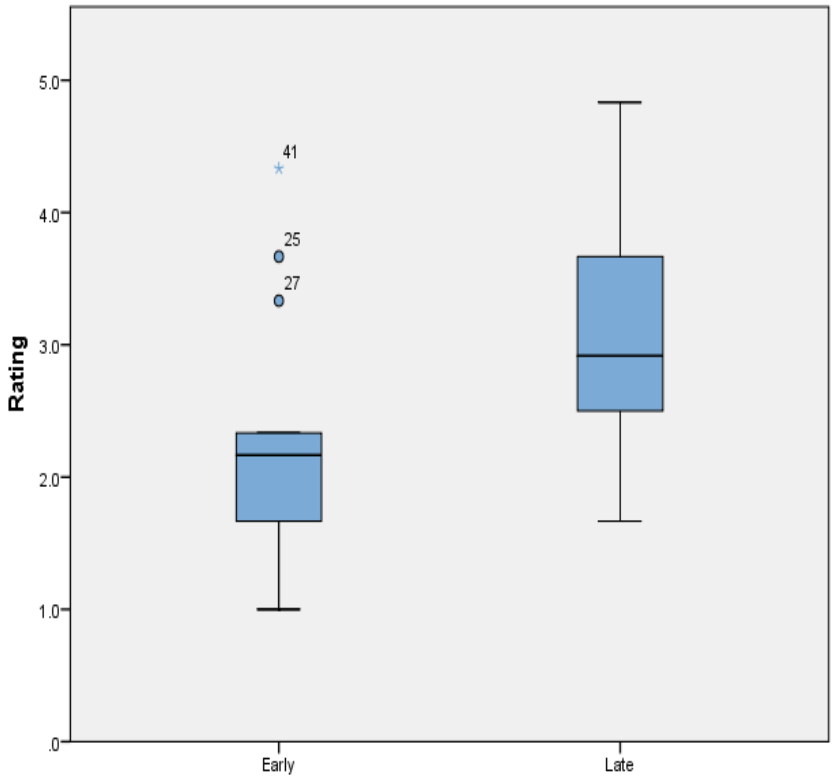




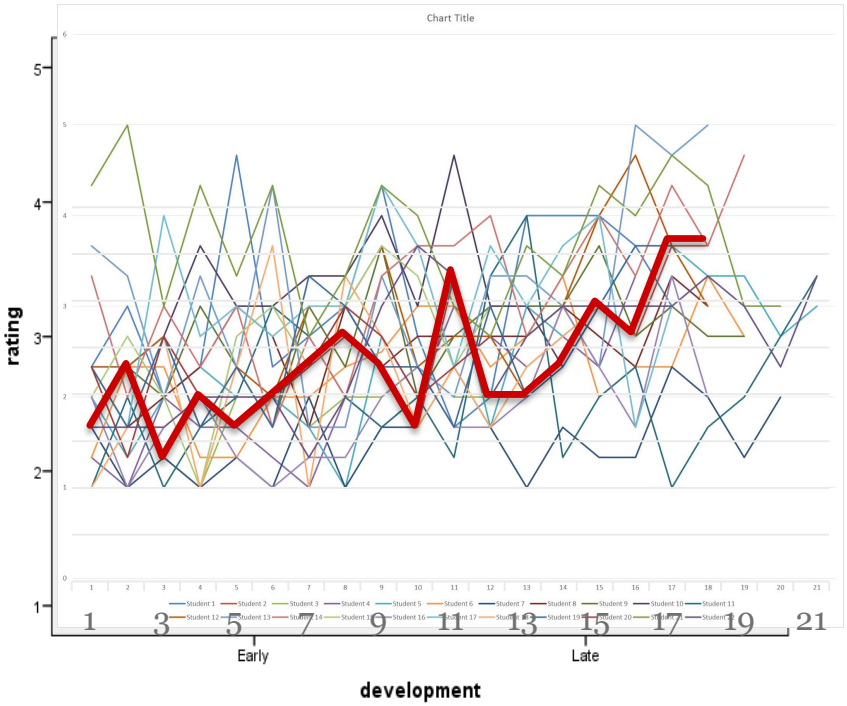
Average first two – average last two measurements

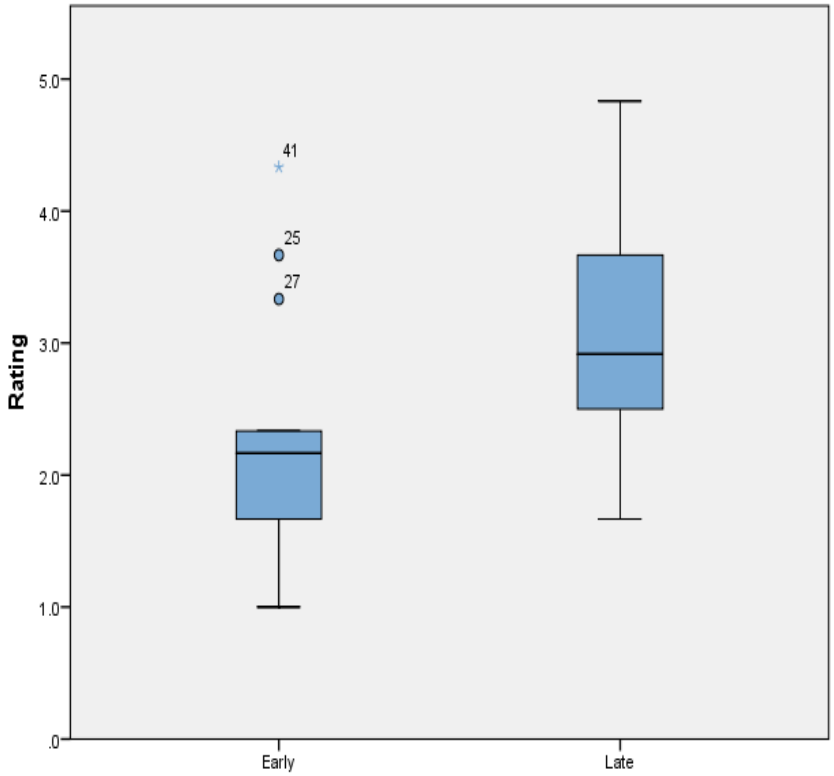
Holistic scores





Holistic scores





Data example 1: process

- No obvious relation between instruction and data
  - Language ‘emerges’
  - Grammar is not ‘leading’
- Development is highly variable
- Development is nonlinear
- Development is individually owned

Towards an integrated dynamic approach

- 1. complex dynamic systems
- 2. the learning process
- 3. explicit vs implicit

1. A complex dynamic perspective

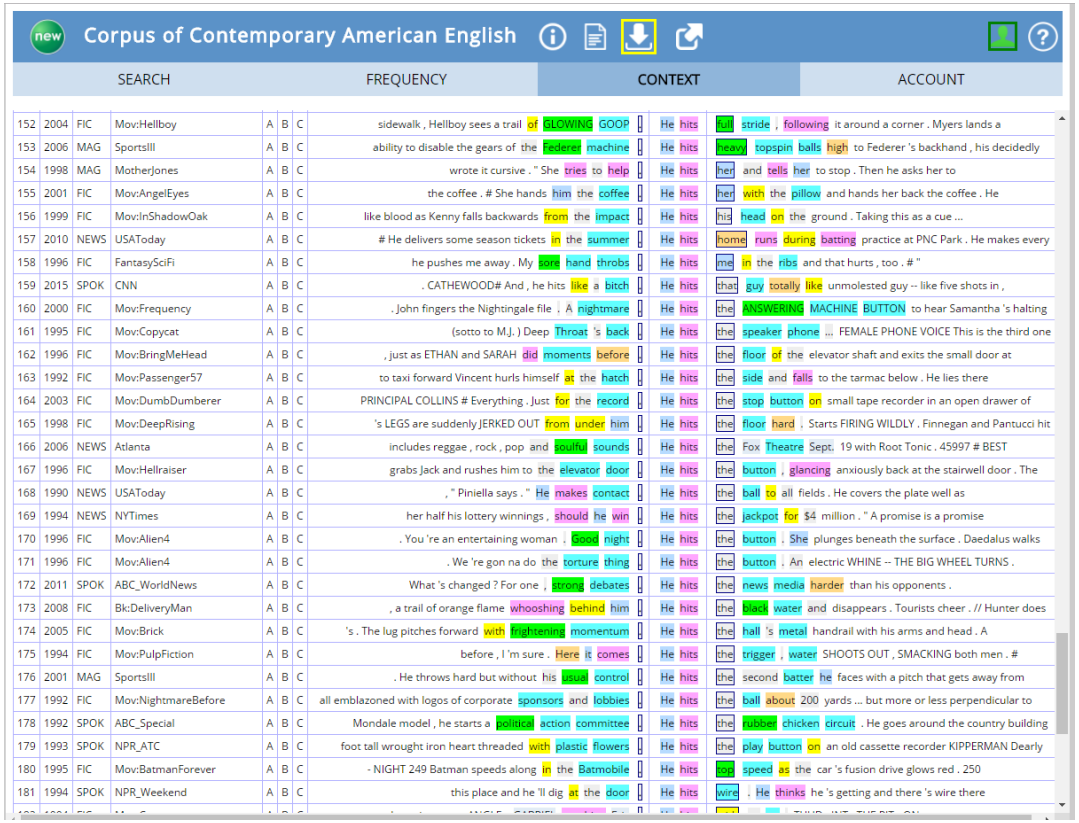
(Second) language development

- Is a *process in time*
- in which *numerous* components
- *dynamically* interact in a *nonlinear* fashion
- leading to emerging self-organization
- manifested by *variability*
- and a highly *individual* trajectory

2. The learning process

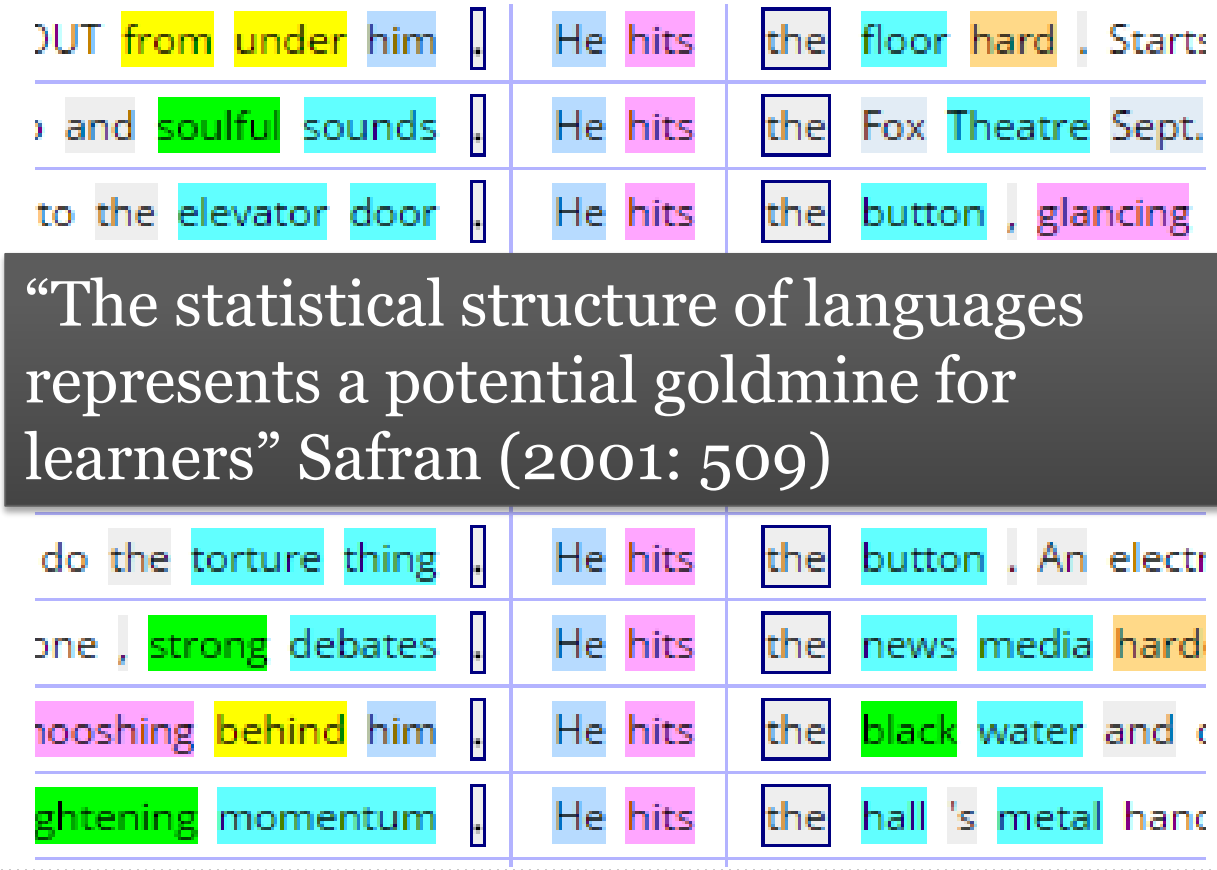
- Distributional properties in the input
- Sensitivity to co-occurrence
- Evidence from artificial language learning, simulations, corpus data (Shaffran, 2001; Elman 2009, Hans-Jörg Schmid, 2015)

Statistical learning



152	2004	FIC	Mov:Hellboy	A	B	C	sidewalk , Hellboy sees a trail of GLOWING GOOP	He hits	full stride , following it around a corner . Myers lands a
153	2006	MAG	SportsIll	A	B	C	ability to disable the gears of the federer machine	He hits	heavy topspin balls high to Federer 's backhand , his decidedly
154	1998	MAG	MotherJones	A	B	C	wrote it cursive . " She tries to help	He hits	her and tells her to stop . Then he asks her to
155	2001	FIC	Mov:AngelEyes	A	B	C	the coffee . # She hands him the coffee	He hits	her with the pillow and hands her back the coffee . He
156	1999	FIC	Mov:InShadowOak	A	B	C	like blood as Kenny falls backwards from the impact	He hits	his head on the ground . Taking this as a cue ...
157	2010	NEWS	USAToday	A	B	C	# He delivers some season tickets in the summer	He hits	home runs during batting practice at PNC Park . He makes every
158	1996	FIC	FantasySciFi	A	B	C	he pushes me away . My sore hand throbs	He hits	me in the ribs and that hurts , too . # "
159	2015	SPOK	CNN	A	B	C	. CATHEWOOD# And , he hits like a bitch	He hits	that guy totally like unmolested guy -- like five shots in ,
160	2000	FIC	Mov:Frequency	A	B	C	. John fingers the Nightingale file ; A nightmare	He hits	the ANSWERING MACHINE BUTTON to hear Samantha 's halting
161	1995	FIC	Mov:Copycat	A	B	C	(sotto to M.J.) Deep Throat 's back	He hits	the speaker phone ... FEMALE PHONE VOICE This is the third one
162	1996	FIC	Mov:BringMeHead	A	B	C	, just as ETHAN and SARAH did moments before	He hits	the floor of the elevator shaft and exits the small door at
163	1992	FIC	Mov:Passenger57	A	B	C	to taxi forward Vincent hurls himself at the hatch	He hits	the side and falls to the tarmac below . He lies there
164	2003	FIC	Mov:DumbDumberer	A	B	C	PRINCIPAL COLLINS # Everything . Just for the record	He hits	the stop button on small tape recorder in an open drawer of
165	1998	FIC	Mov:DeepRising	A	B	C	's LEGS are suddenly JERKED OUT from under him	He hits	the floor hard ; Starts FIRING WILDLY . Finnegan and Pantucci hit
166	2006	NEWS	Atlanta	A	B	C	includes reggae , rock , pop and soulful sounds	He hits	the Fox Theatre Sept. 19 with Root Tonic . 45997 # BEST
167	1996	FIC	Mov:Hellraiser	A	B	C	grabs Jack and rushes him to the elevator door	He hits	the button , glancing anxiously back at the stairwell door . The
168	1990	NEWS	USAToday	A	B	C	, " Piniella says . " He makes contact	He hits	the ball to all fields . He covers the plate well as
169	1994	NEWS	NYTimes	A	B	C	her half his lottery winnings , should he win	He hits	the jackpot for $4 million . " A promise is a promise
170	1996	FIC	Mov:Alien4	A	B	C	. You 're an entertaining woman ; Good night	He hits	the button . She plunges beneath the surface . Daedalus walks
171	1996	FIC	Mov:Alien4	A	B	C	. We 're gon na do the torture thing	He hits	the button . An electric WHINE -- THE BIG WHEEL TURNS .
172	2011	SPOK	ABC_WorldNews	A	B	C	What 's changed ? For one , strong debates	He hits	the news media harder than his opponents .
173	2008	FIC	Bk:DeliveryMan	A	B	C	, a trail of orange flame whooshing behind him	He hits	the black water and disappears . Tourists cheer . // Hunter does
174	2005	FIC	Mov:Brick	A	B	C	's . The lug pitches forward with frightening momentum	He hits	the hall 's metal handrail with his arms and head . A
175	1994	FIC	Mov:PulpFiction	A	B	C	before , I 'm sure . Here it comes	He hits	the trigger , water SHOOTS OUT , SMACKING both men . #
176	2001	MAG	SportsIll	A	B	C	. He throws hard but without his usual control	He hits	the second batter he faces with a pitch that gets away from
177	1992	FIC	Mov:NightmareBefore	A	B	C	all emblazoned with logos of corporate sponsors and lobbies	He hits	the ball about 200 yards ... but more or less perpendicular to
178	1992	SPOK	ABC_Special	A	B	C	Mondale model , he starts a political action committee	He hits	the rubber chicken circuit . He goes around the country building
179	1993	SPOK	NPR_ATC	A	B	C	foot tall wrought iron heart threaded with plastic flowers	He hits	the play button on an old cassette recorder KIPPERMAN Dearly
180	1995	FIC	Mov:BatmanForever	A	B	C	- NIGHT 249 Batman speeds along in the Batmobile	He hits	the speed as the car 's fusion drive glows red . 250
181	1994	SPOK	NPR_Weekend	A	B	C	this place and he 'll dig at the door	He hits	wire . He thinks he 's getting and there 's wire there

Statistical learning



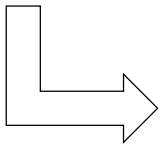
"The statistical structure of languages represents a potential goldmine for learners" Safran (2001: 509)

Statistical learning

- He hits the floor
- He hits the ground
- He hits the button
- He hits the ball

Additional cues across modalities:

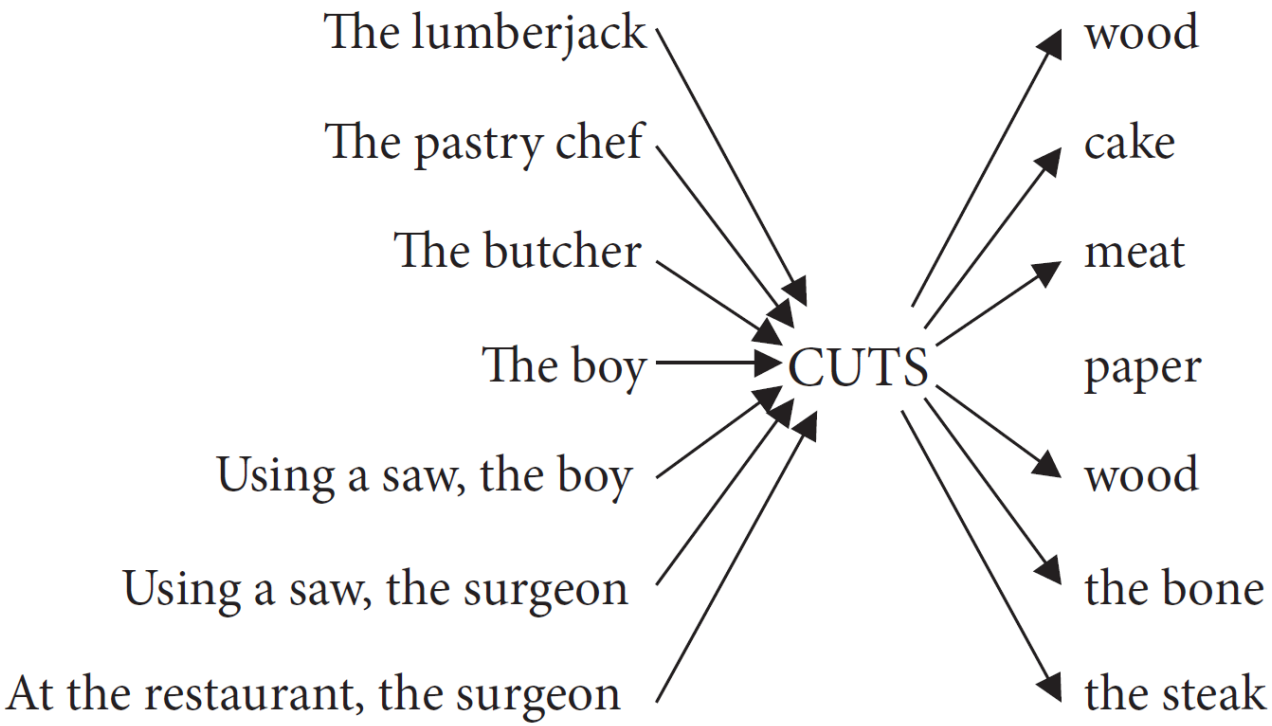
Facial expression
Gestures
Prosody (boundaries markers)
Environment (conventionality)



Adjacent froms: hits the
Nonadjacent forms: he hits

Categorization (pron – verb – det – object)
Schematization

Predictive relationships



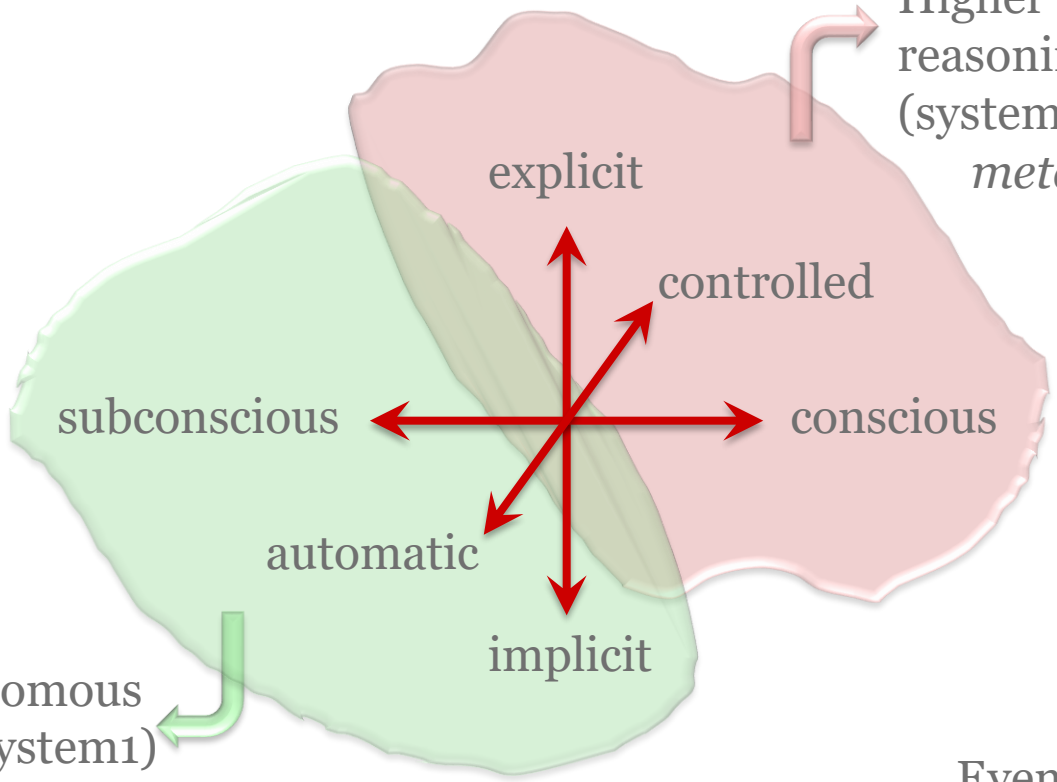
Elman (2009)

Statistical learning and entrenchment

Jost & Christianson (2017)

- Confirmed predictions => entrenchment
- Continuously dynamic
- Statistical learning – categorization – entrenchment: more deeply entrenched – more difficult to overcome

3. Explicit vs implicit



Evens & Stanovich (2013)

Back to our assumptions

- 1. second language development is based on predetermined stages
- 2. language learning benefits from *explaining* the forms or structures, practicing these and testing them

Conclusion (1): learning before you know it

- In a dynamic perspective *learning* is defined as self-organization
- System 1 / system 2:
  - Can statistical learning and self-organization be driven by formal instruction?
- Emerging or predetermined?
- Variability or Error
- Individual differences

Conclusion (2): language teaching

Conclusion (2): language teaching

› Teaching = creating optimal conditions for learning to take place

- Opportunities for statistical learning
- Opportunities for authentic interaction
- Engagement
- Confidence
- Individual coaching
- Acknowledge variability
- Massive meaningful exposure

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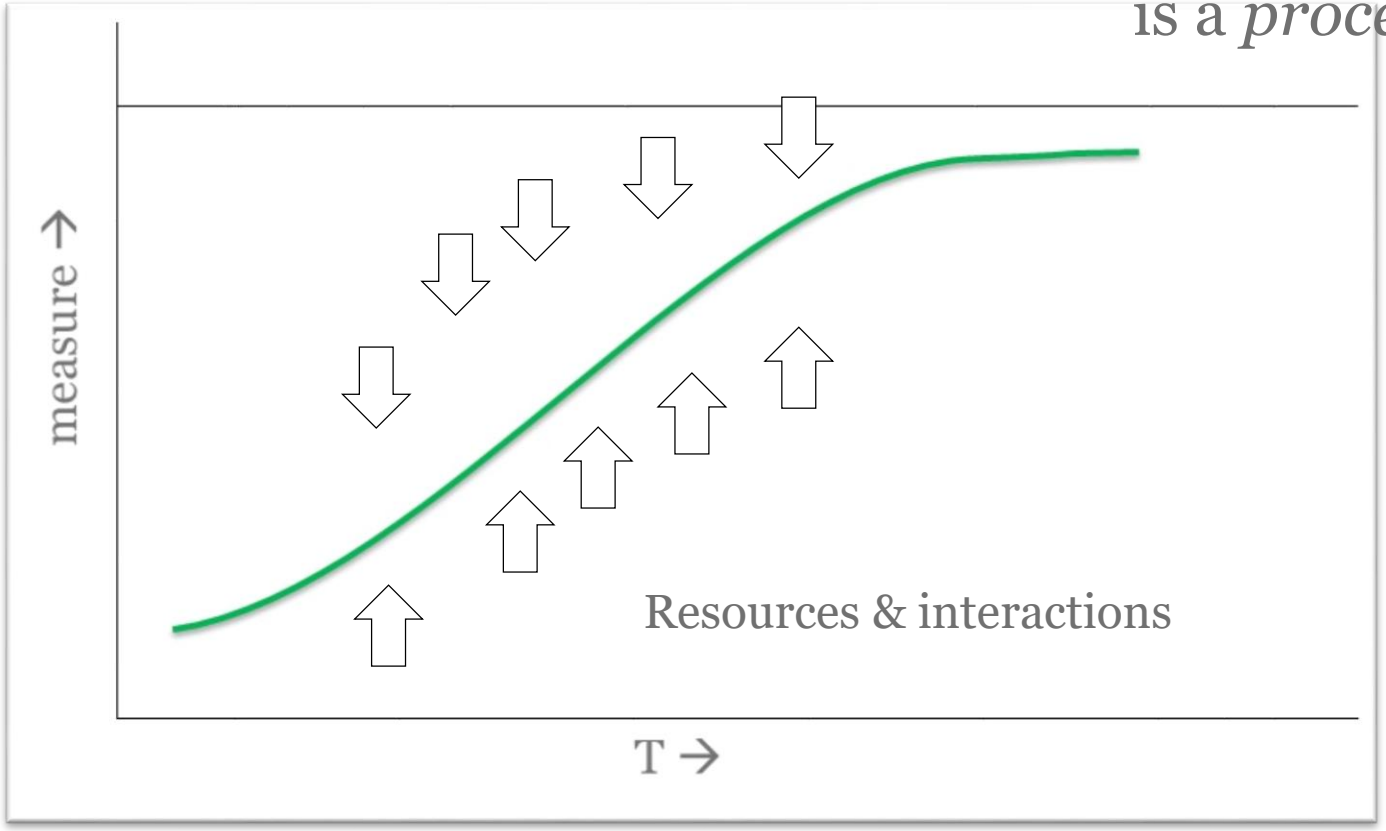
Thank you!

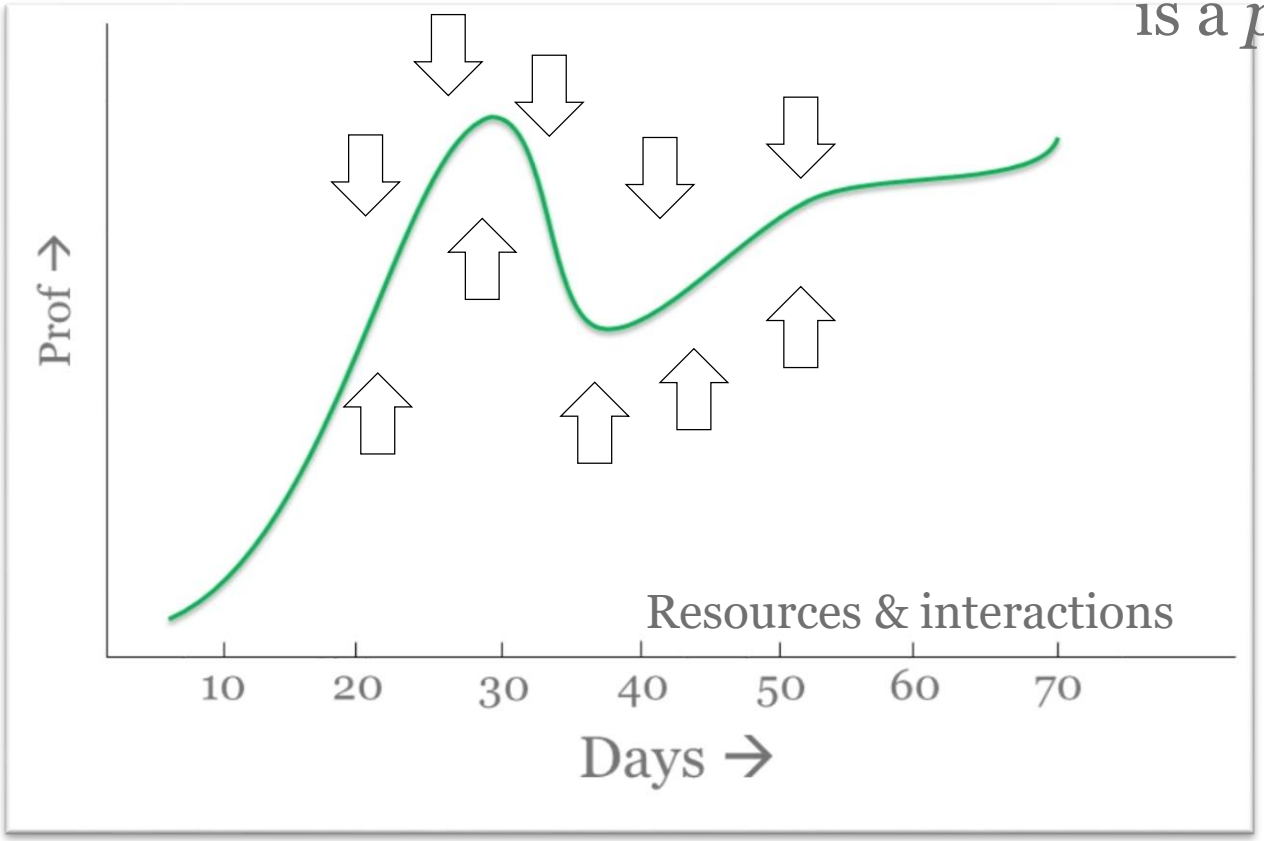
Second language development

is a *process in time*

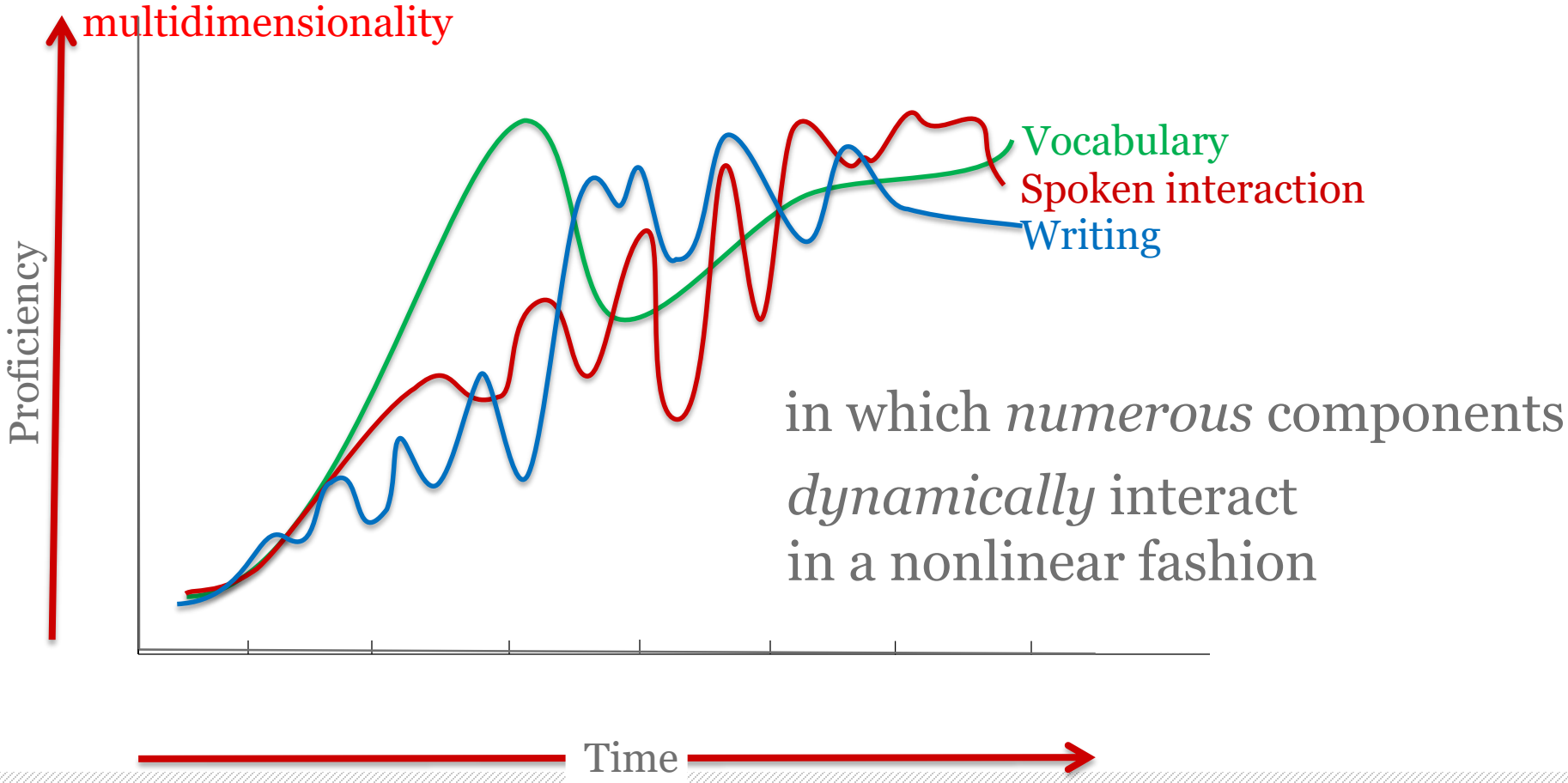


Second language development

is a *process in time*



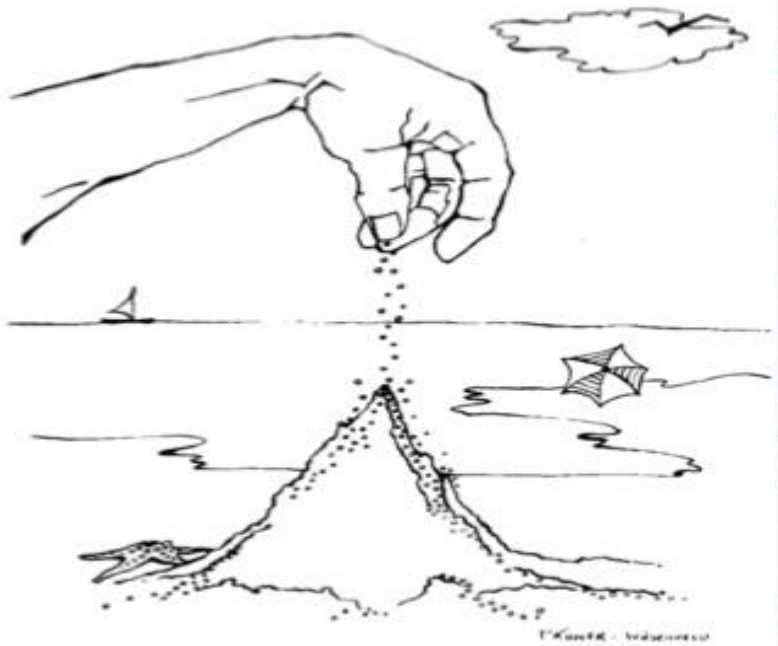
(Second) language development

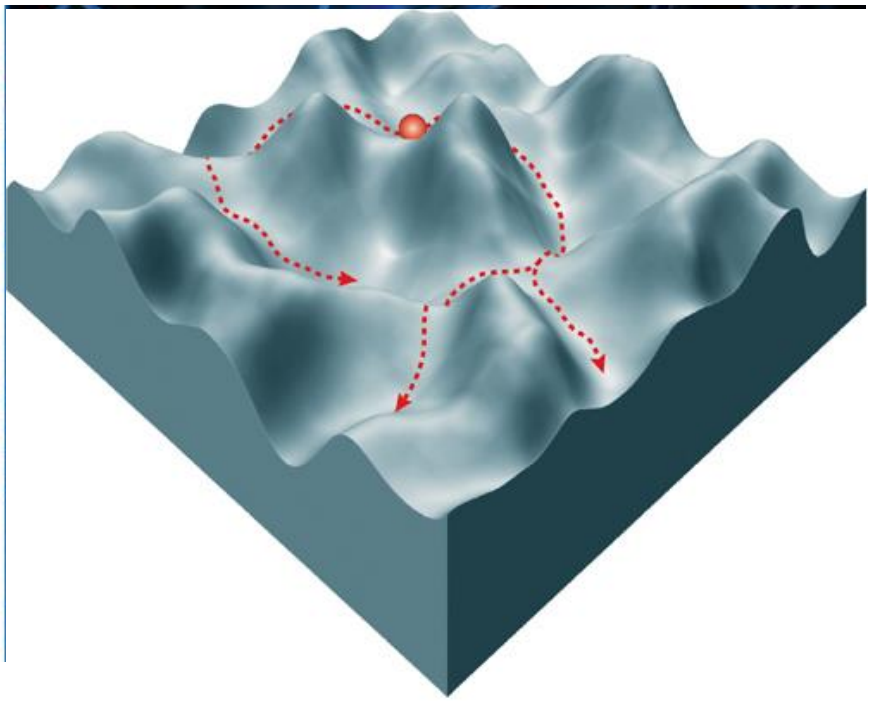


in which *numerous* components
dynamically interact
in a nonlinear fashion

Self-organization

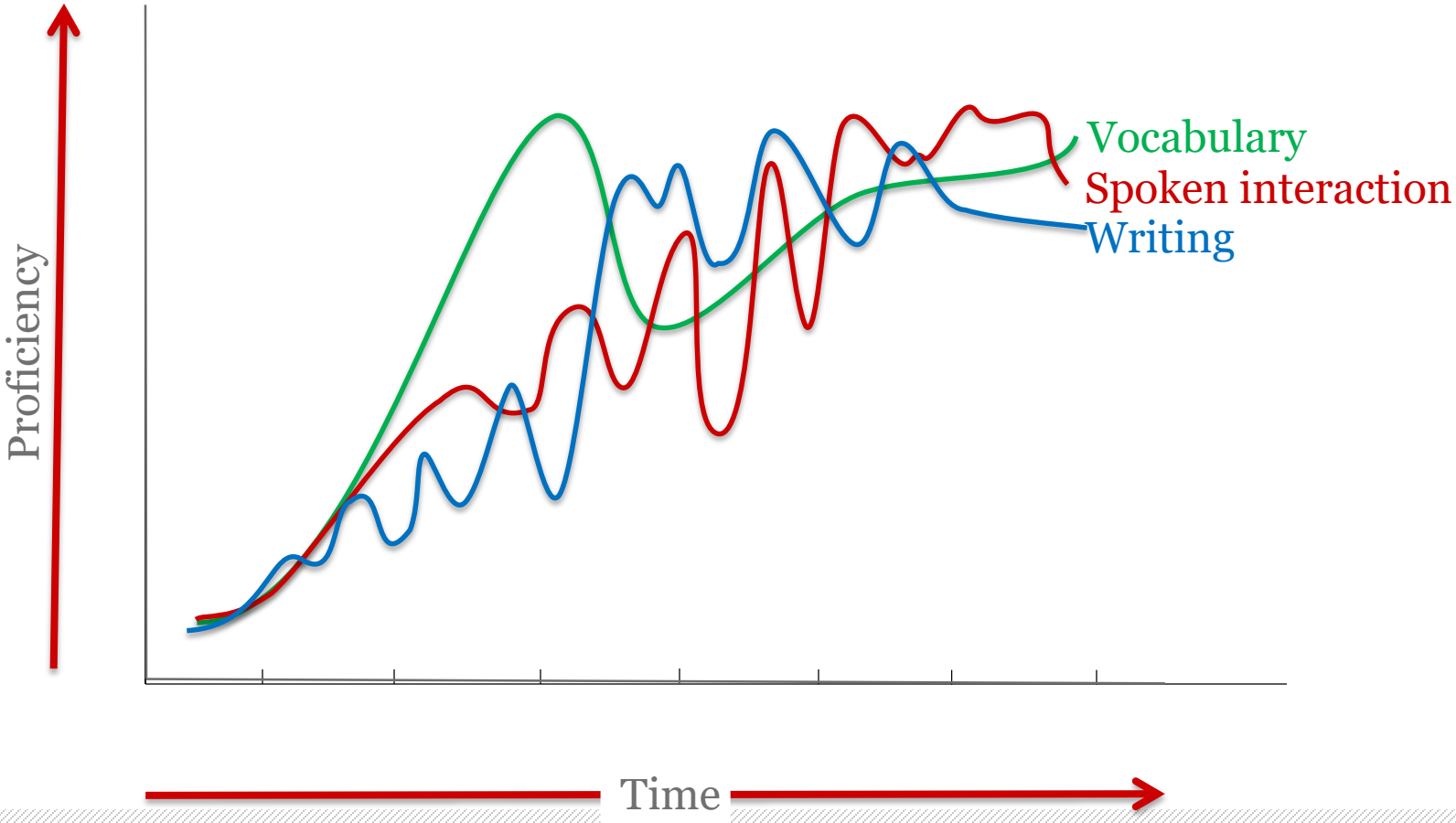
leading to emerging self-organization





Kitzbichler: “the human brain is on the edge of chaos”

manifested by *variability*



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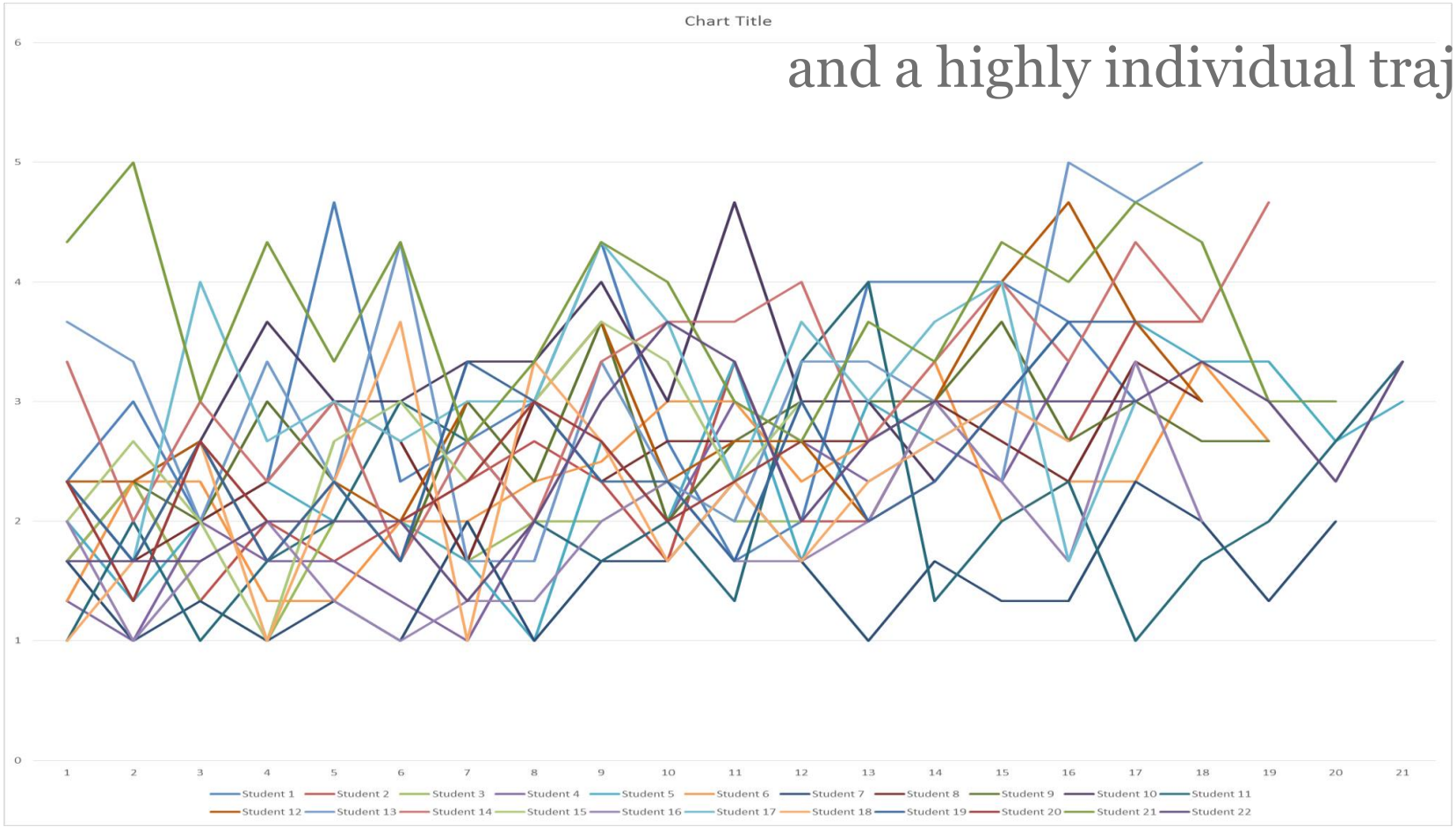
and a highly individual trajectory