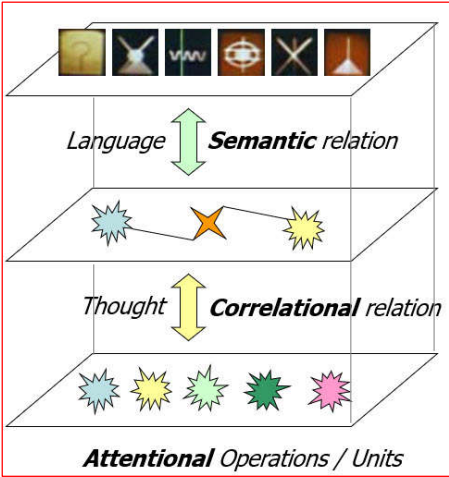




YERKISH

A Visual Language for
Computer-Mediated Communication by an Ape

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Knowledge Management and Collaboration (KMC)

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Agenda

1. Introduction
2. Two videos about the use of Yerkish (< 3 min.)
3. Operational Methodology by Silvio Ceccato
4. Yerkish examples A, B, C (see paper)
5. Lexigram classes and Correlators of Yerkish
6. A Yerkish conversation with Lana (6.5.1974)
7. Conclusion

Link to online material: www.weknow.ch/yerkish

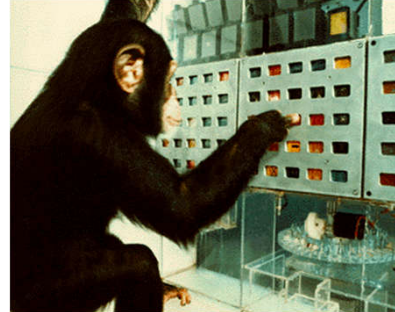


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Introduction



- **YERKISH is a visual language**
 - with a «correlational» grammar (focuses on cognition)
 - developed by **Ernst von Glasersfeld**
(https://en.wikipedia.org/wiki/Ernst_von_Glasersfeld)
 - <https://en.wikipedia.org/wiki/Yerkish>
- **Yerkes Primate Research Center in Atlanta**
- **LANA project, 1970-1976**
 - Principal investigators: Ernst von Glasersfeld, Duane M. Rumbaugh
 - abilities of great apes to communicate with humans by means of a language
 - introduce a computer for monitoring, recording and reacting to all sentences
 - use a visual language, in view of the success of the chimpanzee Washoe with the American Sign Language



11/03/2014/04

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Lana in action 1977 – scene 1 (1'15")



- The Yerkes Primate Research Center in Atlanta (Georgia, USA)
- Timothy Gill, researcher & Lana, 7 years old chimp
- Communication: electronic keyboard, master computer
- Lexigram board
- Computer monitors what Lana says, printed record

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Lana in action 1977 – scene 4 (1':32")

- A memorable occasion: Tim tries to trick Lana (June 11, 1975)
- Tim puts **cabbage** in the machine instead of **chow**
 - Lana: "Tim put chow in machine?" – Tim: "Chow in machine"
 - Lana: "Chow in machine?" – Tim: "Yes"
 - Lana: "No chow in machine" – Tim: "What in machine?"
 - Lana: "Cabbage in machine" – Tim: "Yes, cabbage in machine"
 - Lana: "Tim move cabbage out of machine?" – Tim: "Yes"



Operational Methodology: Fundamental principle



Consider any mental content

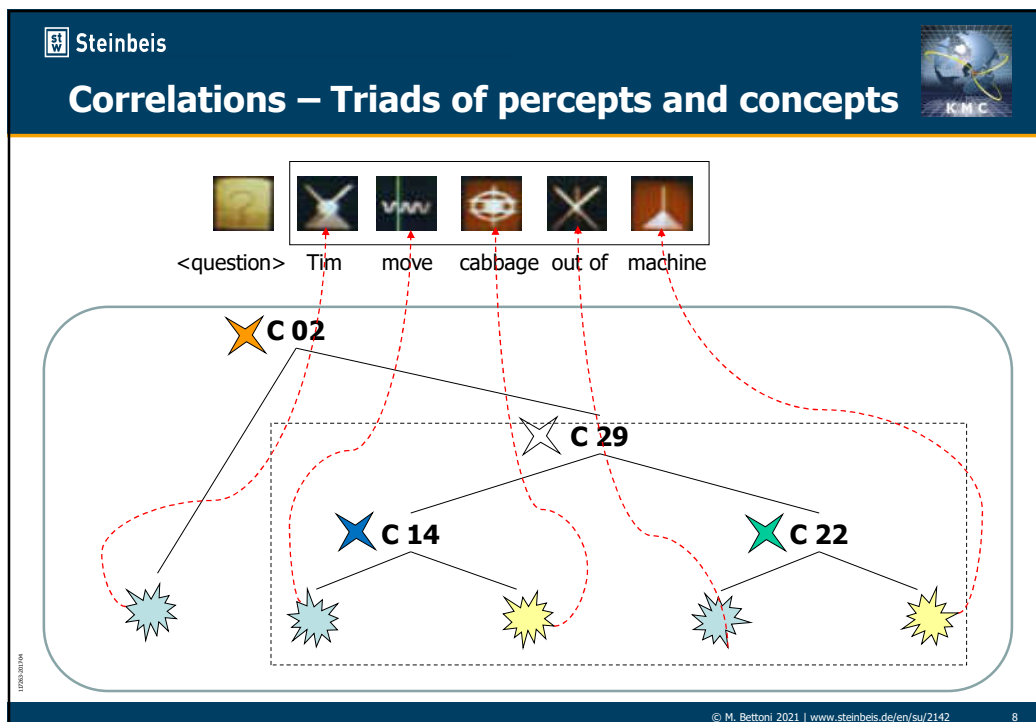
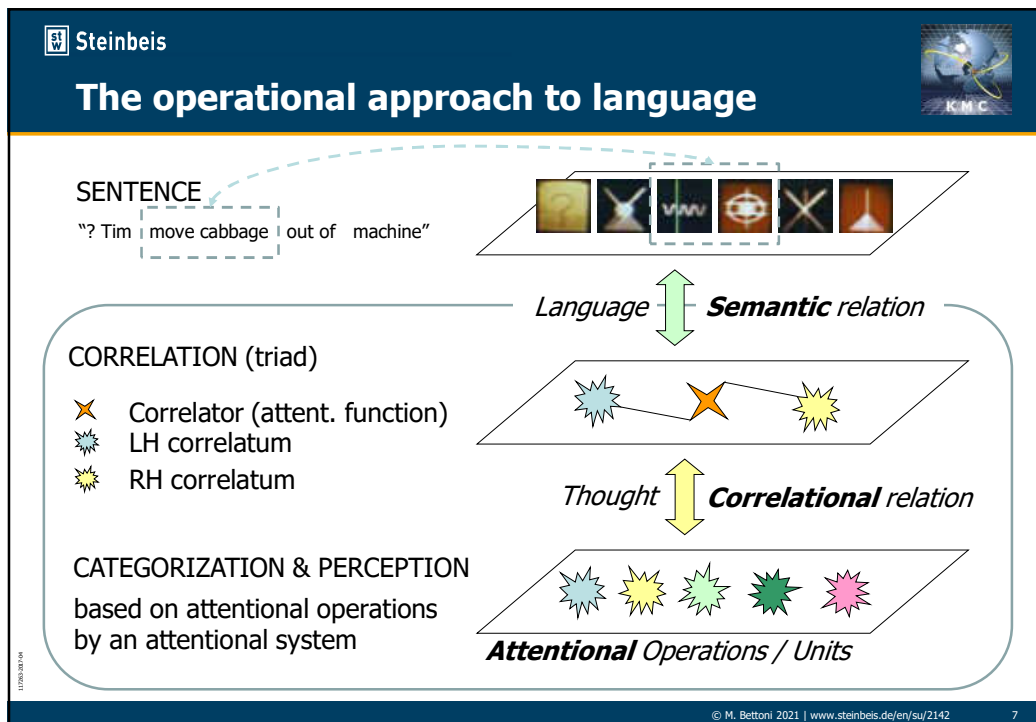
(perceptions, concepts, thoughts, words, etc.)

as a result of

attentional operations

adapted from Silvio Ceccato (1914-1997)

https://en.wikipedia.org/wiki/Silvio_Ceccato





Correlation example A

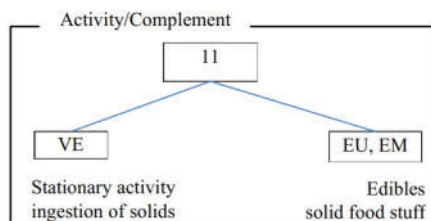


Fig. 5. Correlator 11, *cognitive level*

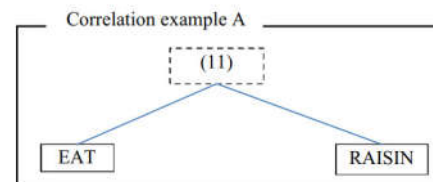


Fig. 6. Correlator 11, *linguistic level*: "EAT RAISIN"



Correlation example B

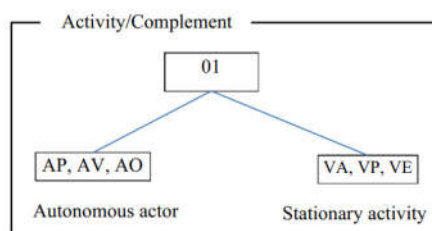


Fig. 7. Correlator 01, *cognitive level*

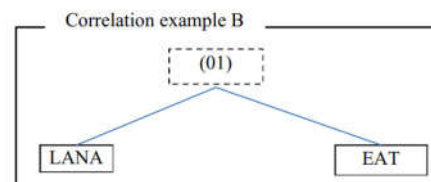
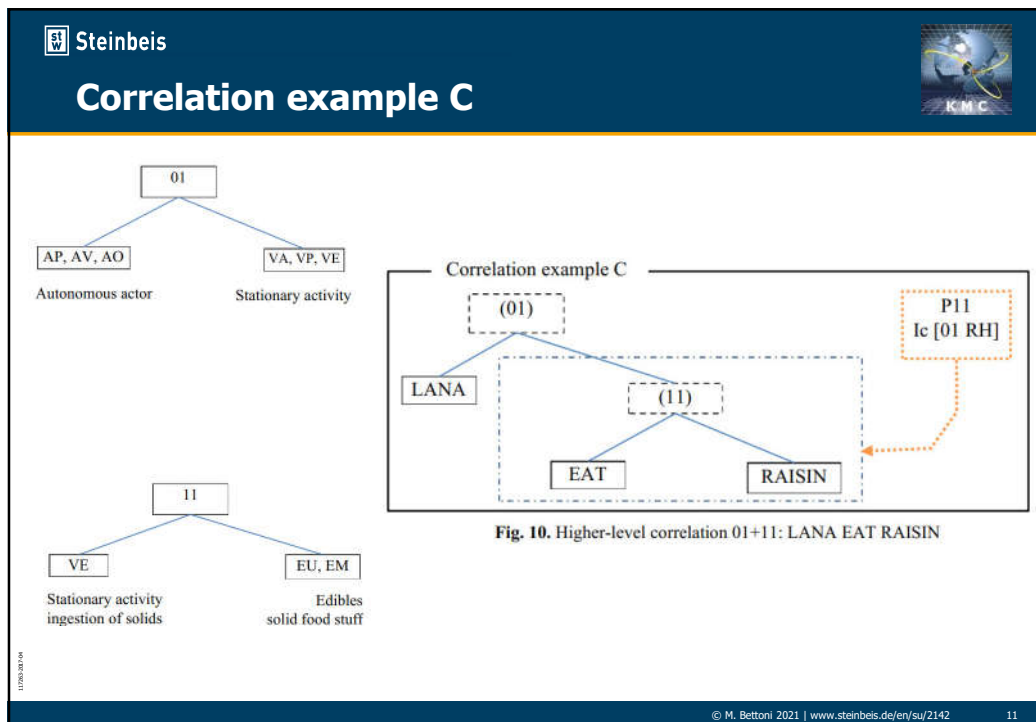


Fig. 8. Correlator 01, *linguistic level*: LANA EAT



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Lexigram Classes

Lexigram class	Abb.	English translation of lexigrams	Comments
Autonomous Actors	AP	BEVERLY, SHELLEY, TIM, LANA	Familiar primate (human and non-human)
	AV	VISITOR	Unfamiliar primate
	AO	ROACH	Non-primates
	AM	MACHINE	Inanimate actor
Absolute Fixtures	FA	FLOOR, KEYBOARD, ROOM	Items that cannot move or be moved
Relative Fixtures	FF	DOOR, PUSH-KEY (push-button), WINDOW	Items that can move but not change place
Transferables	TF	BALL, BLANKET, BOWL, BOX, BUCKET, DOLL, PLATE, STICK	Items that can change place and/or hands
Edibles	EU	M&M (candy), RAISIN	Dispensed as unit
Edibles	EM	APPLE, BANANA, BREAD, CHEW, COOKIE	Dispensed in pieces
Drinkables	ED	COKE, JUICE, MILK, WATER	
Parts of Body	PB	BACK, EAR, EYE, FINGER, FOOT, HAND, HEAD, MOUTH, TUMMY	Can change place but not hands

States, conditions and categories		
Colors, touch, etc.	ST	BLACK, BLUE, GREEN, ORANGE, PURPLE, RED, WHITE, YELLOW, DRY, WET, HARD, SOFT, COLD, HOT, OPEN, SHUT, CLEAN, DIRTY As attributed to items
Locational	LS	AWAY, DOWN, HERE, UP As attributed to items
Ambiental Conditions	CD	COLD n., DARKNESS, HEAT, LIGHT n., MOVIE, MUSIC, SLIDE n., VOICE Signs, sounds, smells, etc. are treated as states of the environment that can be caused (MAKE) by an agent
Conceptual Categories	CT	BEGINNING, BOTTOM, COLOR, CORNER, END, PIECE, SIDE, TOP As applied to spatio-temporal items
Activities		
Stationary	VE	EAT Ingestion of solids
	VD	DRINK Ingestion of liquids
	VA	BITE, GROOM, HIT, HOLD, TICKLE Relational motor act
Locomotive	VB	CARRY Transferring (place change)
	VC	PULL, PUSH Requiring contact and force
	VG	BRING, GIVE Causing change of hands
Stative	VL	MOVE, SWING, TURN Change of place
	VS	LIE, SLEEP, STAND Maintaining position in place
Conceptual	VM	MAKE Causative, creating change
	VP	SEE Perceptual activity
	VW	WANT Conative activity
Prepositions		
Locational	LP	IN, ON, OUTSIDE, UNDER
Directional	DP	BEHIND, FROM, INTO, OUT-OF, THROUGH, TO, TO-UNDER
Purative	PP	OF
Determiners & Markers		
Determiners	DD	THIS, THAT Demonstrative
	DQ	ALL, MANY, NO (not one), ONE Quantitative
	DC	LESS, MORE Comparative
Semantic	NF	NAME-OF Indicating semantic nexus
Identity-Difference	ID	SAME-AS, OTHER-THAN
Attributive	WR	WHICH-IS Also relative clause marker
		PLEASE Request (imperative)
		?? Query (interrogative)
		NOT Negation
		YES Affirmation
	..	(period) End-of-message marker

Table 1. Operational Lexigram Classes [17]

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stW Steinbeis Correlators		
LH Correlatum lexigram class & sub-classes	Correlator ID	RH Correlatum lexigram class & sub-classes
Actor/Activity		
Autonomous actor AP, AV, AO	01	VA, VP, VE stationary activity
Autonomous actor AP, AV, AO	02	VB transferring activity
Autonomous actor AP, AV, AO	03	VC act. requiring contact and force
Autonomous actor AP, AV, AO	04	VP perceptual activity
Autonomous actor AP, AV, AN	05	VG causing change of hands
Causative agent AP, AV, AM	06	VM causing change of state
Actor AP, AV, AO, FP, TE, EU, PB	07	VL change of place
Item capable of changing location AP, AV, AO, FP, TE, EU, EM, ED, PB	08	VS stative activity
Conative agent AP, AO, AV	09	VW conative activity
Predicative Copula		
Item with perceptual characteristics AP, AV, AO, FA, FP, TE, EU, EM, ED, PB, CD, WR	10	ST, LS predicated state
Activity/Complement		
Ingestion of solids VE	11	EU, EM solid food stuff (as patient)
Ingestion of liquids VD	12	ED liquid (as patient)
Stationary motor activity VA	13	AP, AV, AO, FA, FP, TE, EU, ED, PB any spatial item (as patient)
Transferring VB	14	item capable of change of place AP, AV, AO, TF, EU, ED, PB
Activity/Spatial Adjunct		
Contact and force VC	15	any spatial item (as patient) (same as for 13!)
Perceptual activity VP	16	any perceptual item (as result) AP, AV, AO, FA, FP, TE, EU, EM, ED, PB, CD
Change of hands VG	17	handable item (as patient) AO, TF, EU, ED
Causing change VM	18	condition or state CD, CS
Conative activity VW	19	desired item (as result) AO, TF, EU, ED, CD, VE, VD, VS
Relation Whole/Part		
Change of place VC, VL (and P's 14,15,17)	21	LS (and P's 22) target location
Directional preposition DP	22	specification of target AP, AV, AO, FA, FP, TE, EU, EM, ED, PB
Stative activity localization VS, (and P's 11, 12, 13)	23	specification of location LS (and P's 24)
Locational preposition LP	24	specification of location (same as for 22!)
Naming Function		
Item considered "part" PB, CT	25	PP partitive preposition
Item considered "part" P's: 25	26	item considered "whole" AP, AV, AO, FP, TE, EU, EM, ED, PB, DD
Conceptual Categorization		
Semantic indication NF	27	AV, DD item to be named
New lexigram or WHAT	28	item designated
Determiner DO, DC, DD	30	any item singled out AP, AV, AO, FA, FP, TE, EU, EM, PB, CD, CT
Relative Clause		
Item to be qualified AP, AV, AO, FA, FP, TE, EU, EM, ED, PB, CD	31	WHICH-IS (WR) restrictive marker
Comparative State		
Quantitative determiner DQ	32	ST, LS, LP, DP state
Identity Function		
Identify-difference marker ID	33	term of comparison AF, AV, AO, FA, FP, TE, EU, EM, EU, PB, CD, DD
Sentence Modifiers		
Request marker PLEASE	40	expression turned into request
Question marker QUERY	41	expression turned into question
Negation marker NOT	46	expression negated

Table 3. Operational Correlators connecting lexigram classes and sub-classes [17].

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stW Steinbeis Conversation with Lana, May 6th, 1974		
Lana	? TIM GIVE LANA THIS CAN	
Tim	YES	
-	<i>Tim gives her the empty can, which she at once discards</i>	
Lana	? TIM GIVE LANA THIS CAN	
Tim	NO CAN	
Lana	? TIM GIVE LANA THIS BOWL	
Tim	YES	
	<i>Tim gives her the empty bowl</i>	
Lana	? SHELLEY - (Sentence unfinished)	
Tim	NO SHELLEY	
-	<i>Shelley, another team member who worked with Lana, is not present</i>	
Lana	? TIM GIVE LANA THIS BOWL	
	<i>Before Tim can answer, Lana goes on</i>	
Lana	? TIM GIVE LANA NAME-OF THIS	
	<i>A spontaneous generalization of GIVE, not foreseen by the grammar of Yerkish, since NAME-OF had not been classified as a possible object of GIVE!</i>	
Tim	BOX NAME-OF THIS	
Lana	YES (Short pause, and then)	
	? TIM GIVE LANA THIS BOX	
	<i>Tim gives it to her, she rips it open and eats the M&M</i>	

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Conclusion



- **Lana learned to communicate in Yerkish**
 - mediated through a computer
 - capable of forming correct sentences
 - able to form new sentences
- **How?**
- **Hypothesis**
 - The correlational structure of Yerkish matches and activates the intellectual abilities of apes (and of similar animals ...)

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8. <http://www.facebook.com/marco.bettoni.17>



36ος ΜΑΡΑΘΩΝΙΟΣ ΑΘΗΝΑΣ, Ο ΑΥΘΕΝΤΙΚΟΣ
 36th ATHENS MARATHON, THE AUTHENTIC
 SUNDAY NOVEMBER 11th, 2018

Marco Bettoni Marathon

TIME

4:06:00

MARATHON PHOTOS

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