

Embodied grammar in Dutch dairy cows

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Background

GOALS

- To examine inter- and intraspecies language practices in Dutch dairy cows
- To investigate how to conceptualize cow language (embodied, multimodal)

WHY DAIRY COWS?

- Understudied species concerning language
- Multimodal communicators (tactile, gustatory, visual, auditory, olfactory modi (Marino and Allen 2017; Oliveira & Keeling 2018))
- Emancipation of cows who have distinct personalities and stable personality characteristics and a clear capacity to lead rich and socially complex lives instead of commodities.

METHODOLOGY

- **Bottom-up methodology (De Waal & Ferrari 2010):**

“the most logical route for comparative cognition, however, is to try to understand the **basic processes and common denominators** first before exploring species-typical specializations.” (De Waal & Ferrari 2010:205)

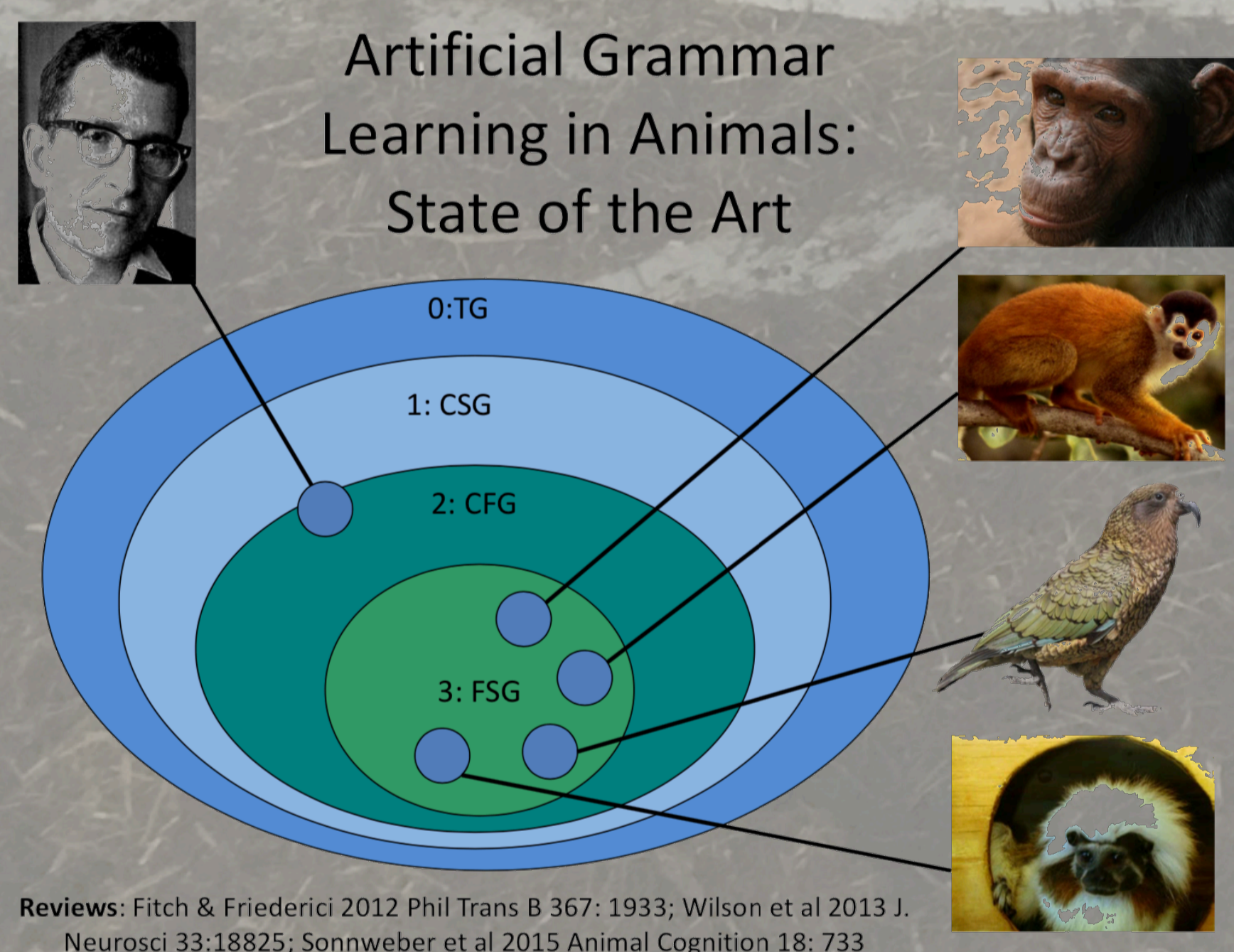
- **Umwelt-methodology (Von Uexküll 1928, De Waal 2016)**

“Following in the footsteps of Kafka and Von Uexküll we are trying to get under the skin of other species, trying to understand them on their terms. (De Waal 2016:19)”

Linguists on animal language

De Waal 2016:18: “*measure animals by human standards*”, Top-Down, Human-Central:

- “Whereas chimpanzees show some planning capacity under natural conditions and some ToM under experimental conditions – both rudimentary compared to humans – *their language is not just rudimentary under natural conditions but absent.* [...] “Why would that be so? Hauser et al. (2002) and Fitch et al. (2005) explore the idea that the core of the issue resides in the combinatorics of the syntactic system. To put it simply: humans have **recursion**, nonhumans do not.” Reuland (2012:217)
- **Fitch (2018):**



Reviews: Fitch & Friederici 2012 Phil Trans B 367: 1933; Wilson et al 2013 J. Neurosci 33:18825; Sonnweber et al 2015 Animal Cognition 18: 733

- **Chomsky, Hauser & Fitch (2002):** “FLB includes a sensory-motor system, a conceptual-intentional system, and the computational mechanisms for recursion, providing the capacity to generate an infinite range of expressions from a finite set of elements. We hypothesize that FLN only includes recursion and is the only uniquely human component of the faculty of language.”

Bottom up methodology:

(following e.g. De Waal 2016 & De Waal & Ferrari 2005)

- Identify basic properties of language as a cognitive module
- Hypotheses concerning these basic processes and common denominators are based on human language
- Investigate the Umwelt of other species, in our case dairy cows, to discover whether these basic properties are present and whether there are properties that are absent in Human Language
- Investigate how these basic properties are realized (modalities)
- d

Basic Properties of HL syntax:

(Chomsky 1995 et. seq.)

• Lexicon

concepts/words “eating”/ “dog”

aspect (habitual, progressive etc.)

functional features verbal domain: tense / modality / negation / focus / question

functional features nominal domain: person / number / deixis

- **Syntax** → combining concepts/words with functional features

• Challenges to studying syntax in cows:

- Cow syntax has not been previously studied
- Cow language is multimodal (and not predominantly vocal or signed as in songbirds/humans) (Vallée-Tourangeau and Cowley 2013)

Functional features in cow Language

(movies)

VERBAL DOMAIN:

Aspect: habitual = ruminating

Negation: Do **not** approach me

Modality: I **want to** be brushed

I **want to** be touched

I **might** want to be approached

Focus Greeting (Cornips 2019)

Question Who are you?

But also, lacking in Human functional features (Umwelt):

Trajectory: Path through olfactory modus

NOMINAL DOMAIN:

Person/Number: I, You_{sg}, You_{pl}, We_{incl}, We_{excl}, Deixis

We_{incl} forthcoming → synchronizing during eating (Cornips & Van den Hengel,

I versus you_{sg} → smelling, allogrooming

I versus you_{pl} → “I want to be with you_{pl} over there” (cow separated + Deixis from the herd)

Conclusions

1. Functional information is present in cow language:

Verbal domain: Aspect; Negation; Modality; Focus

Nominal domain: Person, Number, Deixis

2. Cows implement the basic functional features differently from humans using other modalities.
3. Cows also have functional information that is absent in humans (e.g. trajectory)
4. Cow language provides us with a new and unique insight in the cognitive module of language:
 - Basic concepts of language can be expressed via different modalities
 - The implementation and functional information is dependent on the Umwelt of the species under investigation.
5. These insights can help us to study language in other species (like in Humans)

Selected References

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