Group size, vocal grooming and the origins of language

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Paper overview

This paper is about the events that led to the origin of language (social grooming, breath control, hearth).

First of all, some idioms (expressões idiomáticas)

Social Grooming

Behaviour in which social animals, including humans, clean or maintain one another's body or appearance.

First of all, some idioms (expressões idiomáticas)

Glass ceiling

Metaphor used to represent an invisible barrier that keeps a given demographic from rising beyond a certain level in a hierarchy. In the paper context it refers to the constraints imposed by time, that can be overcomed by find more efficient ways of doing things.

Timemarkers

- 2 Ma[1] — **Rise of early *Homo***
- 1 Ma — Control of fire
- 500 Ka[2] — **Laugh and sing**
- 400 Ka — **Hearths as a regular feature on fossil sites**
- 200 Ka — Appearence of our own species

At some point between 2 Ma and 200 Ka, *Hominis* began to increase the size of the social groups beyond monkeys and apes.

[1] Million years ago
[2] Thousand years ago

Rise of early *Homo*

- We "started" as great apes - they bound their social groups through social grooming
- There is a relationship between social group size and the amount of time devoted on social grooming - since grooming is a one-on-one activity, it prevents larger social groups

Rise of early *Homo*

The social brain hypothesis

"Primates evolved large brains to manage their unusually complex social systems"

The grooming on primates brains

triggers a neuroendocrine mechanism that sustains boundings in primates - the endorphin system. The endorphin inhibit the communication of pain signals and produce a feeling of euphoria

Rise of early *Homo*

How did they break through the glass ceiling in a direction of larger groups?

Laugh and sing

Laugh

- Both humans and great apes laugh - and the laughting act triggers the endorphin system just like the social grooming
- Laughting has a visceral involuntary quality
- It is more explicity social and can happen in larger groups (in opposition of grooming, a one-on-one activity)
- Doesn't need language to happen

Laugh and sing

Laughting decrease the amount of time demand for socialization!

Laugh and sing

Sing (wordless sing)

- Also triggers the endorphin system, and can occur regardless of the group size
- Led to anatomicaly features related to speech (all seem to appear around this time)
  - **Thoratic nerve** - Control of the diaphragm and chest wall muscles
  - **Hypoglossal nerve** - Control of tongue
  - Ear canals capable of **hearing human speech**

"This might mark the point at which speech evolved"

Laugh and sing

Relationship with speech

- Singing, laughting and speech shares important features:
  - Segmentation - syntatical structuring of long sentences
  - Breath control - longer exhalations for speech fluency
  - Vocal production

Hearths became a regular feature on fossil sites

Hearths

- Indirectly helped to develop speech
- They lengthen the active day (adding 4-5 hours) - the evening lend itself to socialising
- Helped bound the group together
- Humans are the only anthropoid primate capable of being active both day and night

"It would have provided a natural template for the evolution of voiced speech, [...] by the very short additional step of mapping meaning onto sound"

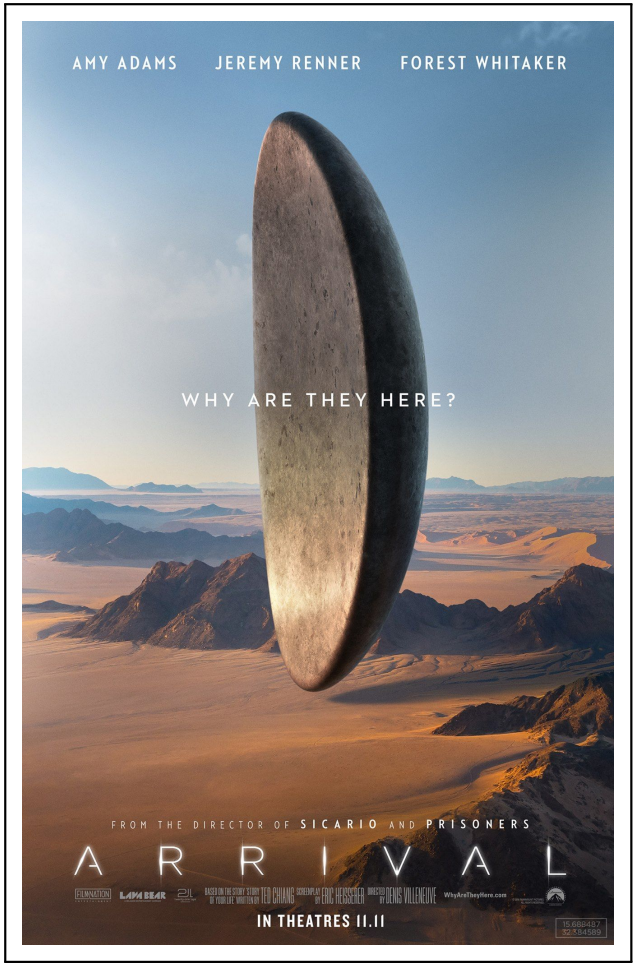
Conclusion

The specialised bounding mechanisms presented here helped break through a series of successive glass ceilings. The author suggests that language evolved from primate vocalisation, via an intermediate musical phase, and it's use was explicitly social.

Why did I choose this paper?

- Phylosophy of mind - there are theories that argues that our mind and cognition are a consequence of our language.
- Language is interesting.
- Evolution - for the past two years I've been doing scientific research on evolutionary computation.

Why did I choose this paper?



Linguistic relativity - the structure of the language affects it's speaker perception of the world

Likes and dislikes

Likes

- I am interested in evolution, regardless of the field.
- The reading flows very well, sometimes I have to reread the paper many times, but not this one.

Dislikes

- The size of the paper is too small - but that is expected for a brief report.
- The paper is more about evolution than neuroscience.
- Doesn't have even one figure to help visualize some information.

References

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