Early sea-crossings: Survey and comparison between *Homo* species

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Overview

Starting point:

Sea-crossings are a strong indicator of a sophisticated ‘language’

Questions to address:

What do we know about early sea-crossings?

How can we analyze and interpret this knowledge?
(especially regarding the capacities of different species)
Outline

• Sea-crossings: a modern behavior requiring « language »

• Context and detection of early sea-crossings

• Comparison between *H. sapiens* and *H. erectus*

• Survey of detectable sea-crossings
Outline

• Sea-crossings: a modern behavior requiring language
As a starting point…

• We know that:

  • *H. sapiens* reached and colonized Australia around 60 ky ago

  • To do so, they had to cross a body of water of at least 90 kms (plus several others)

→ 60,000 years ago, our predecessors were capable of an impressive ‘tour de force’
A difficult task

• Crossing a large body of water is a dangerous task requiring various expertises

• « Long lasting buoyancy requires a sophisticated technological knowledge »

• Colonizing Australia involved a sufficient number of individuals, who therefore had to sea-cross together and were able to settle and survive in a new environment

→ Did this success require language as we know it today?
Why sea-crossings are a strong indicator of language?

• Technological development required to build robust rafts (Davidson & Noble, 1992):
  • Polylithic assemblage, cooperation between individuals
  • Cf. putative links between language and stone tools (Leroi-Gourhan)

• Intentional process and motivations underlying the use of a raft to reach a distant island (Hombert & Coupé, 2002):
  • Distributed cognition (Strum & Foster 1999)
  • Cf. links between language and metaphysical conceptions implied by burials with offerings
Significant parameters

• Accidental versus intentional sea-crossings:
  • Winds, currents, size of the target

• Distances to cross
  • Small distances (few kilometers) may not require strong rafts
  • They are more likely to be crossed often and accidentally
  • More incertitude about possible terrestrial paths

• Visibility = possibility to observe a target location over the horizon
  • A good basis for intentional sea-crossings
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• **Variations of sea level during prehistory:**
  - A recurrent phenomenon during the last millions of years
  - Milankovitch’s variations in Earth orbital parameters

• **Complex phenomena:**
  - Non-linearities in evolution of climate
  - Tectonic movements
  - Hydro-isostasy (weight of water)

→ **Unavoidable approximations**
  - More valid for ‘recent times’ (< 500 ky)

From (Berger & al, 1996)
How to detect sea-crossings?

• Artefacts (specific tools, rafts)?
• Underwater discoveries?

• Another approach:
  → Consider and investigate locations only reachable by sea-crossing at the lowest sea levels ($\approx 100 – 150 m$) during the last 1 My
  → Look for the ‘best conditions’ for the crossing
  → Look at colonization events in the archaeological record for these key locations

  Or vice-versa…

• NB: *some (likely many) early sea-crossings cannot be detected today*
Source of data

• Numerical topographic and bathymetric global databases:
  • ETOPO 2 (2’ worldwide database) (Smith & Sandwell, 1997)
  • Precision of the data

• ‘Local’ nautical charts
  • paper maps / digitalized charts

• Measurements:
  • Use isobath lines
  • Measure distances for shortests paths
  • Estimate conditions of visibility for target location (from sea level / neighbouring higher location)
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Who crossed first?

• Are sea-crossings the restricted domain of *H. sapiens*?

• The ‘classical’ case: the colonization of Sahul
  • « Why the first colonisation of the Australian region is the earliest evidence of modern human behaviour »
    (Davidson & Noble’s paper title; 1992)

• Critics:
  • Very little attention paid to possible *H. erectus*’ sea-crossings
  • (Bednarick, 1997; 1999)
Two opposite views

• One (extreme) position:
  • Intentional sea-crossings as a recent event, restricted to *H. sapiens*
  • Accidental sea-crossings to Australia
  • Framework: behavioral modernity restricted to late *H. sapiens*

• Another (extreme) position:
  • *H. erectus* mastering sea-crossings more than 800,000 years ago
  • Framework: *H. erectus* as ‘capable’ as *H. sapiens*, demonstrating fully modern behaviors (cf. debates about ritual burials and other symbolic manifestations); *regional continuity*

→ Various proposals for sea-crossings, with their characteristics, should be investigated in an integrative way free of *a priori*
Two clear instances for *H. sapiens* before 50,000 BP

- The colonization of Sahul (60 ky BP):
  - Several sea-crossings, with at least one 90 kms wide
  - Existence of a route to New Guinea with permanent visibility from sea level (Irwin, 1992) (Hombert & Coupé, 2002)
  -> no need to suppose ability of crossing without visibility (Bednarick, 1998)
Two clear instances for *H. sapiens* before 50,000 BP (2)

- The colonization of the Andaman islands (around 50-60 ky BP, DNA analyses):
  - One sea-crossing of around 60 kms at -80m
  - Visibility, but not at sea level
  - (Hombert & Coupé, 2003)
**H. erectus’ sea-crossings (1)**

- **To Flores (Indonesia):**
  - Lower Palaeolithic before 800 ky (Morwood, 1998)
  - Difficult to make predictions given the highly unstable geography of the region
  - Pay attention to crossings of other animals
  - One or several sea-crossings, at least 10 kilometers wide, up to 30 kilometers (Bednarick, 2001)

- **To Timor and Roti (Indonesia):**
  - Middle Palaeolithic
  - (Bednarick, 1998, 1999)
  - One sea-crossing from Flores, distance around 30 kms
**H. erectus’ sea-crossings (2)**

- **To Sardinia via Corsica:**
  - colonized by Neandertal at least 300,000 years ago (Bini, 1993)
  - connected to Corsica at lower sealevels
  - two sea-crossings, likely between 10 and 20 kilometers

- **To Cephalonia (Greece)**
  - Mousterian tools (Kavvadias, 1984)
  - one sea-crossing, likely 4-5 kms wide
Analyses: Differences between *H. sapiens* & *H. erectus’* crossings

- **Distances to cross:**
  - Long vs. short distances (< 30 kms vs > 60 kms)
  - Quantitative differences, but not qualitative

- **Visibility:**
  - Good visibility for all *H. erectus’* crossings
  - Visibility sometimes at the threshold for *H. sapiens*, or no visibility but use of indirect cues (birds, smokes, clouds)

→ No qualitative differences at first sight...
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Perspectives

• Until now, few ‘early’ sea-crossings detected
  → Hypotheses based on few evidences
  → A weak indicator?
    • depends partially on the number of ‘detectable’ sea-crossings
    • Were there many opportunities to reach close/distant islands?

• The theory is *falsifiable*:
  • any new discovery can confirm / infirm hypotheses made
  • In which locations would such discoveries be significant?
A world survey of valid traces of early sea-crossings

• In progress (access to maps)

• Investigated regions:
  • Mediterranean sea
  • African coastlines
  • Southern Asia
  • Australia / Philippines / New Guinea
First results

• Many islands are candidates as ‘detectable’ and valid targets of sea-crossings
  • Islands in the Wallacea regions (Sulawesi, Wetar and more eastern/north-eastern islands, islands south of Sumatra, and even Australia)
  • Islands in the Mediterranean sea:
    • Greek islands (Kithera, Skantzoura Is., Skiros, Kithnos, Andros etc.)

• Gibraltar Strait: a strong candidate (less than 10 kms to cross, with good visibility), however not clearly backed up with clear archaeological evidence

• A passage between North Africa and Sicilia?
  • Serki Channel / Serki bank, north of Tunis
  • Sea southwest of Sicilia (I. Pantelleria)
Another view at differences between *Homo* species

- *Homo erectus*:
  - A few attested sea-crossings, many possibilities
  - A large time window

- *Homo sapiens*:
  - In a narrow time window:
    - A large number of sea-crossings:
      » limit visibility and later no visibility
      » large distances to cross
Proposal

• No difference in technological development

• No difference in intentional capacities

• A stronger exploratory behavior for *H. sapiens*
  • will to discover new places (metaphysical beliefs?)
  → reach distant & remote islands (limit visibility)
Summary

• Sea-crossings are a strong indicator of language

• Regarding sea-crossings, *H. sapiens* & *H. erectus* do not differ:
  • in technological development
  • in intentional capacities

• Differ in their exploratory behavior

• Language may not play a significant role to this respect

• New discoveries may contradict (more ancient *H. erectus’* distant sea-crossings) this hypothesis
Thank you for your attention