Out of Africa
- behavioral advantage
- MHB
  - “package” model
  - cumulative model
  - predictions of OOA
  - predictions of MR
- archaeological markers
technology
  - ecology
  - economy/social organization
  - symbolic

African Evidence
- stone blades @ Baringo, 250 ka
- organic tech @ Katanda, 90 ka
- small game in S. Africa, 100-75 ka
- symbolic tech @ Blombos, 73 ka
- art?

Out of Africa & MHB
- the “package” model
  - features that characterize MHB arose simultaneously
  - coincident with origin of anatomically modern humans
- the “cumulative” model
  - individual features added gradually to behavioral repertoire culminating in MHB
  - event that produced anatomically modern humans also produced cognitive conditions necessary for cumulative behavioral evolution to occur

Adaptive implications
- the “package” model
  - adaptive advantage resides at “level” of the behavioral package
  - remove one feature and the “package” fails
- the “cumulative” model
  - adaptive advantage lies at the level of the individual behavior
  - adaptation increases with each additional feature added to repertoire

Out of Africa: behavioral predictions
- chronology…
  - MHB earliest in Africa & then spreads to other areas of the Old World
- stratigraphic sequences…
  - in Africa continuous transition from archaic to modern behavior
  - archaic traits transformed into modern behavioral traits
  - outside Africa abrupt replacement of archaic behavior with modern behavior
  - no transition between archaic and modern behavior allowed
Out of Africa: predictions
- behavior and biology…
  - appearance of MHB tightly linked to the appearance of AMH
    - MHB is the primary pre-mating isolation mechanism

- ecology and evolution…
  - MHB gives higher RS
    - energy capture greater and/or mortality reduction greater

Multiregional: predictions
- chronology…
  - different elements of MHB appear earliest in different regions
  - no constraint on date of earliest appearance
    - should be expected to be regionally variable in timing of appearance

- stratigraphic sequences…
  - continuous transitions from elements of archaic to elements of modern behavior found in different regions
    - individual archaic traits transformed into modern behavioral traits

support for a “cumulative” Out-of-Africa model

<table>
<thead>
<tr>
<th></th>
<th>Africa</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blade tech</td>
<td>Kapthurin</td>
<td>250 ka</td>
</tr>
<tr>
<td>Organic tech</td>
<td>Katanda</td>
<td>90 ka</td>
</tr>
<tr>
<td>Small-game</td>
<td>Klasies</td>
<td>118-70 ka</td>
</tr>
<tr>
<td>Ochre use</td>
<td>Blombos</td>
<td>73 ka</td>
</tr>
<tr>
<td>Ornaments</td>
<td>Blombos</td>
<td>73 ka</td>
</tr>
<tr>
<td>Art</td>
<td>???</td>
<td>???</td>
</tr>
</tbody>
</table>

Multiregional: predictions
- behavior and biology…
  - appearance of modern behavior NOT linked to appearance of a geographic population of AMH
    - MHB is not a pre-mating isolation mechanism
  - MHB appears in “bits and pieces”
    - MHB appears as a geographic and temporal mosaic
      - traits may spread individually or as clusters, but there is no single “package” of traits definitive of modern behavior

- ecology and evolution…
  - modern behavioral “package” != higher RS
    - individual “modern” traits combine with “archaic” traits yielding same energy capture & survival rates
Upper Paleolithic Revolution in Europe

Upper Paleolithic in Europe
- Aurignacian Stone Technology
  - prismatic blade technology
  - UP Tools: end scrapers, burins, carinated scrapers
    - low frequencies of MP tools: side scrapers, backed knives, points, notch-denticulates
- Aurignacian bone-tooth-horn-ivory-shell
  - split-based bone points
  - tooth/shell pendants and other ornaments
  - bone awls (sewing?)
- Aurignacian clothing/textiles?
  - bone awls at start of Aurignacian
  - bone needles by 27 ka (?)

Upper Paleolithic Blade Technology
- “prismatic” blades
  - working of bone
  - reductive technology, but plastic

Bone awls
- complex composite technologies
- split-based bone point (also bevel-based)
Aurignacian personal ornamentation
deer tooth pendant from La Souquette, SW France

“Venus of Willendorf” 27-22 ka

Dolni Vestonice, Czech Republic, ca. 30 ka
woven basket impressions on fired clay!

Chauvet, France ca. 31 ka

function vs. style

artifact function =
- hypothesized or inferred mode of use
- related to mundane activities \( \rightarrow \) energy capture + mortality reduction
- considered to constrain design of artifacts (i.e., there are “best” designs for a harpoon or blade core)
- assumed to be what selection “sees”

artifact style =
- artifacts or attributes that are not easily attributed a mode of use
- particularly if appear to have no function in \( RS = CR + FR \)
- not considered to be seriously constrained in design
- assumed to be under limited or no selective pressure
- style is “neutral” and can “drift” like neutral genes
Vessel form = function
Painted design = style

What is functional?
What is stylistic?

Style... “I know it when I see it”

Chronology of the Upper Paleolithic in Europe
- Aurignacian (45 ka?) 40-28 ka: East-West trend in dates?
  - N. Spain earlier dates than S.W. France?
  - Abric Romani, Spain: AMS $^{14}$C = 37 ka, U-Series 43-45 ka

Out of Africa
behavior vs. hominid types

Out of Africa predicts a strong relationship between hominid type and behavior
- AMH → modern human behavior
- archaic hominids (e.g., neanderthal) → archaic behavior

Out of Africa predicts abrupt replacement of MP over its entire range
- no mixing of MP and UP traits
- what does this mean in terms of Culture?

behavior vs. hominid types

modern anatomy – archaic behavior!
- Qafzeh and Skhul 120-80 ka

associated MP stone technologies

behavior vs. hominid types

archaic anatomy – modern behavior!
- Chatelperronian, SW France and N Spain, (45?) 36-32 ka

St. Cesaire neanderthal
mix of MP-UP tools in Chatelperronian

neanderthal ornaments from Arcy-sur-Cure!
Multiregional Mosaic in Cultural Evolution