

# Cultural distances

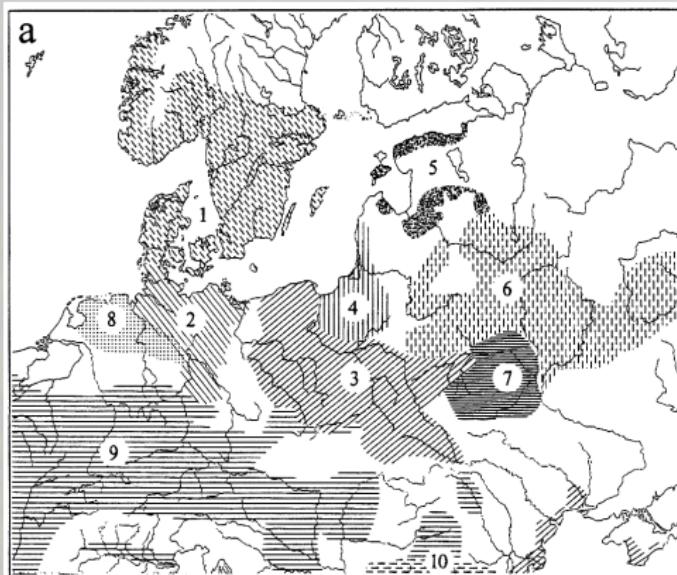
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2018-08-20

Introduction  
Cultural distances  
Cultural areas  
Distance diagrams  
Networks  
Conclusion

# Culture in Archaeology

- ▶ Approach to interpret artifacts without attached meaning
- ▶ Connecting people and artifacts
- ▶ Using available informations (spatial location and typology)

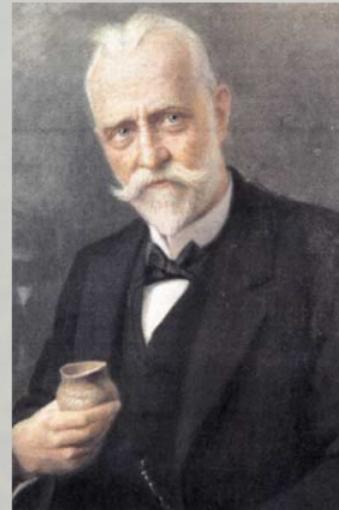


Iron Age cultures according to Meier 2010

## traditional „Culture“ in Archaeology

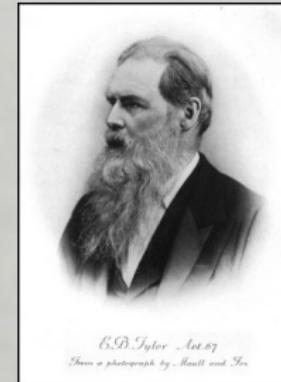
Archaeological culture =  
spatial and temporal limited  
entity of material culture  
cultures can correspond with:

- ▶ language
- ▶ people
- ▶ race
- ▶ collective identity
- ▶ ...



# Components of cultural theory

- ▶ What is culture?  
Hansen, Tylor, ...
- ▶ Why using culture?  
B. Malinowski, A. Schweitzer, ...
- ▶ How does culture work?  
T. Parsons, A. Kroeber, R. Dawkins, ...
- ▶ How are cultures connected?  
F. Steger, ...
- ▶ How do cultures evolve?  
O. Spengler, R. Redfield, R. Linton u. M. Herskovits, ...
- ▶ Which components have cultures?  
J. Huxley, ...



# What is wrong with the traditional approaches?

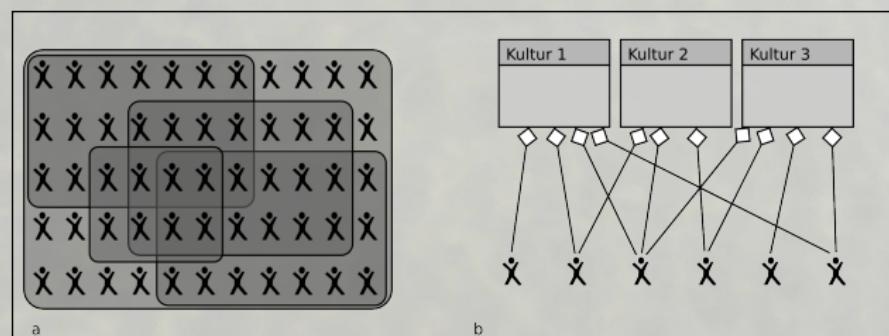
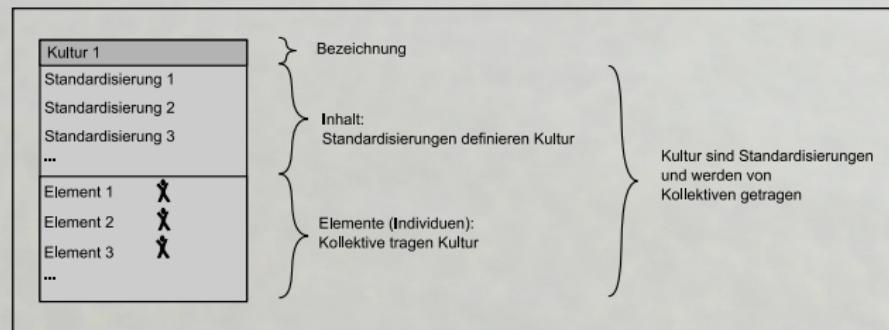
# Definition 1

**Culture** covers  
standardisations which  
are valid in collectives.

Hansen 2003, 39

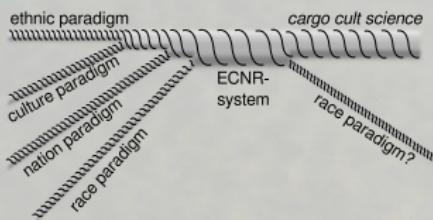
## Culture

- ▶ Formal and abstract definition which covers most other
- ▶ Spatial archaeological cultures as special case
- ▶ Applicable in archaeology



Cultures are mapping interaction structures

# ECNR System



- ▶ **Ethnic Groups** = historical identification
- ▶ **Cultures** = empirical foundation
- ▶ **Nations** = significance for people
- ▶ **Races** = modern science based on laws of nature

ethnic group = seed of nation = race = culture

# SHKR System



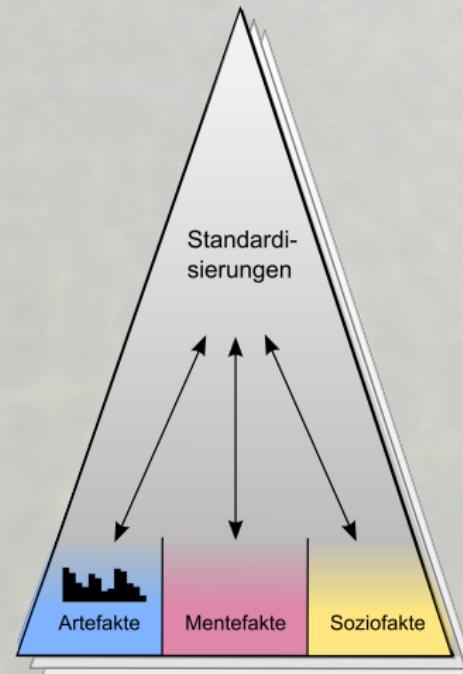
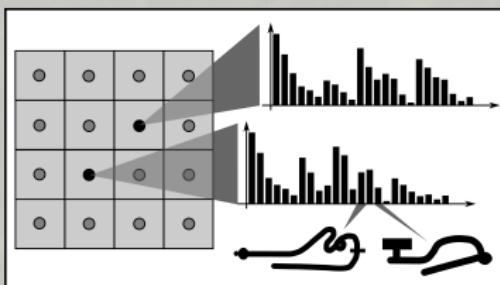
- ▶ **Ethnic Groups** are the results of social interaction
- ▶ **Cultures** are the adaptation, caused by interaction
- ▶ **Nations** are the result of political interaction
- ▶ '**Races**', or rather biological units are the result of biological interaction

ethnic group ≠ seed of nation ≠ race ≠ culture

**Archaeological cultures are models of interaction spaces.**

## 'Typenspektren'

- ▶ All data are used for the calculation of cultural distances
- ▶ No diagnostic types or cultural markers
- ▶ 'Typenspektren' include the relative amount of objects of certain types.



## Cultural fingerprint

- ▶ 'Typenspektren' are a kind of cultural fingerprints.
- ▶ 'Typenspektren' don't assume spatial archaeological cultures
- ▶ 'Typenspektren' consider quantities and not only presence/absence.
- ▶ for every type of 'Typenspektren' a group of types, representing a certain part of society can be defines.
- ▶ 'Typenspektren' provide much more information and are much more robust than so called 'cultural markers'



## 'Typenspektren' - using all available information

...

2; "Beil"; xxx

22; "Beil, Tüllenbeil"; xxx

221; "Beil, T, Schlichte vierkantige T"; xxx

2211; "Beil, T, Schlichte vierkantige T, Norddeutsche T, Var. Hesepe"; xxx

...

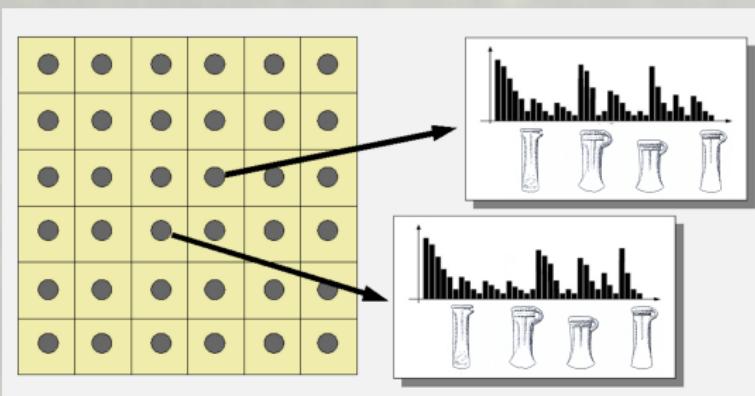
4; "Nadel"; xxx

41; "Nadel, Rippenkopfnadeln"; xxx

411; "Nadel, Rippenkopfnadeln, Var. Nutteln"; xxx

412; "Nadel, Rippenkopfnadeln, Var. Badenstedt"; xxx

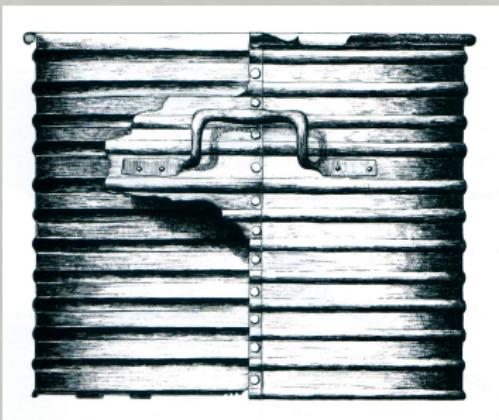
...



# Which information can be used in 'Typenspektren'?

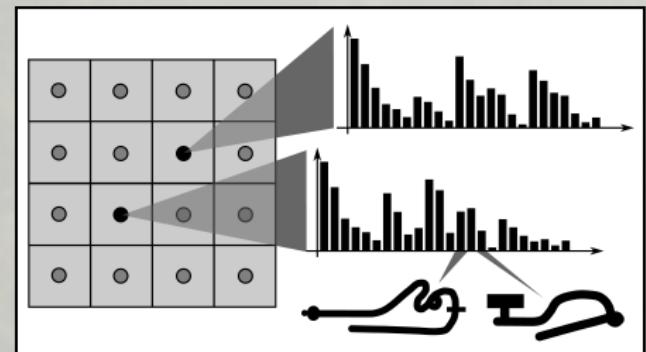
## Imports vs cultural distances

- ▶ connecting a site to a provenience region
- ▶ individual interactions can be traced



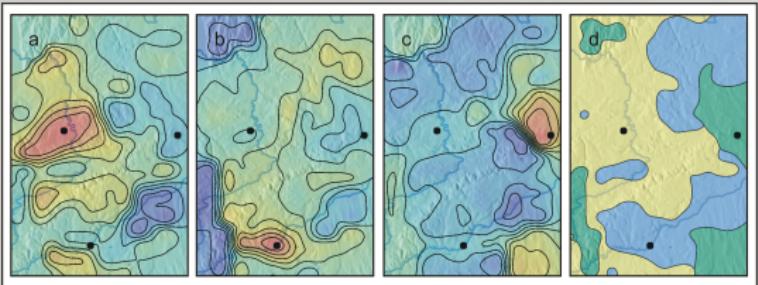
## Cultural distance

- ▶ interactions are producing cultural similarities
- ▶ difference in material culture
- ▶ statistical level of interaction between sites or regions



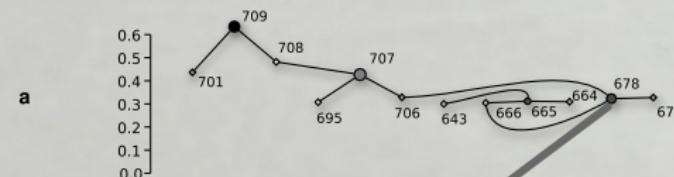
## Map of cultural distances

- ▶ the cultural distances to one reference point are mapped on a grid
- ▶ topography of cultural similarities
- ▶ structure of interaction space



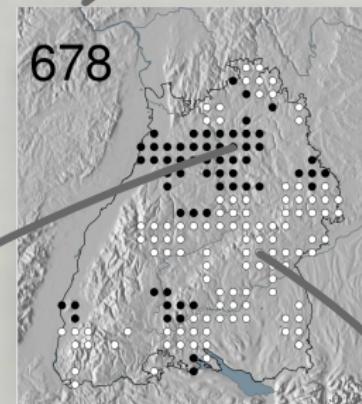
# Interaction spaces

- ▶ groups of similar material culture indicate interaction spaces
- ▶ hierarchical Cluster analysis of regional *Typensprektern*
- ▶ cultural distance as Euclidean distance of two normalised *Typensprektern*

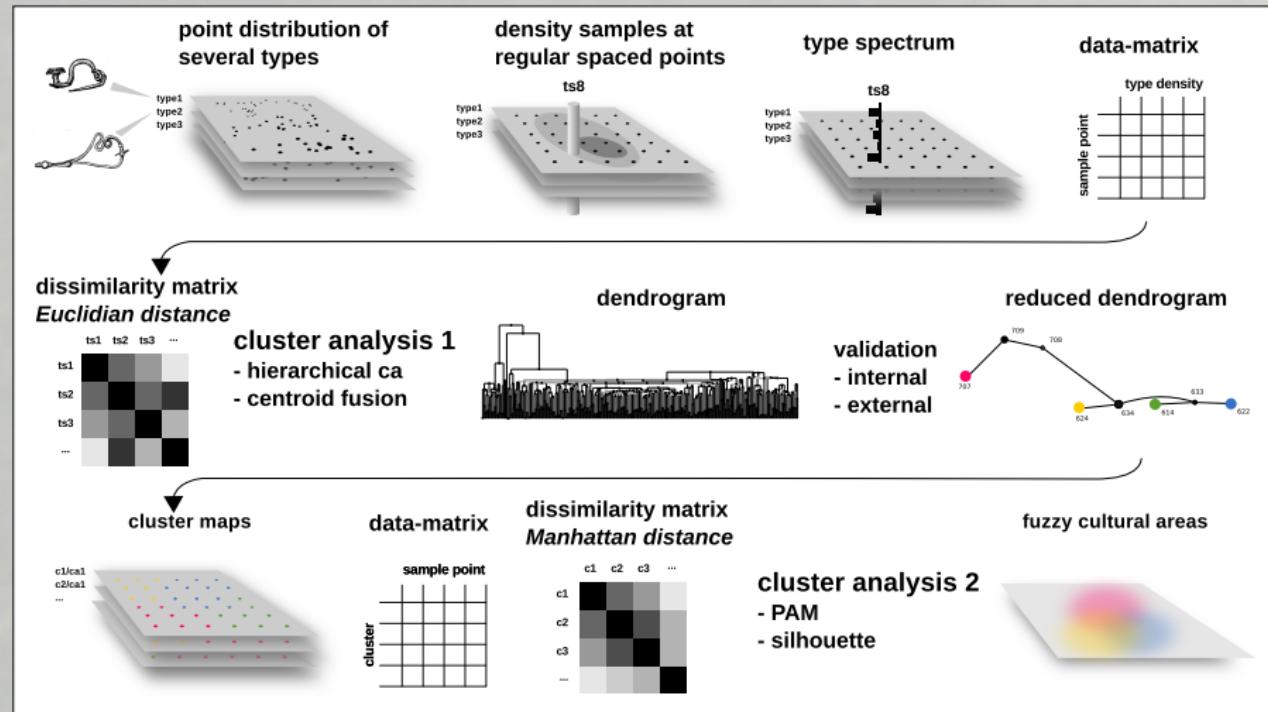


Cluster analysis ceramics, Ha D2/D3

- a) Reduced dendrogram which shows only the most important clusters for interpretation  
 b) Map of sample points belonging to cluster 678 with subclusters marked in white and black  
 c) "Typenspektren" of two different sample points

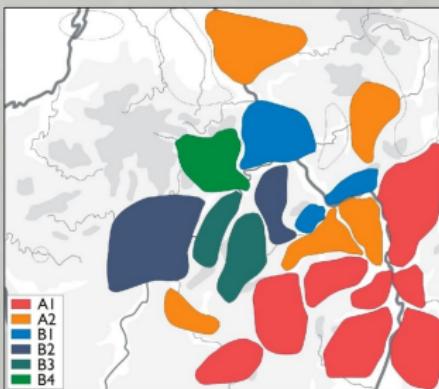


# Methodology for cultural areas / interaction areas



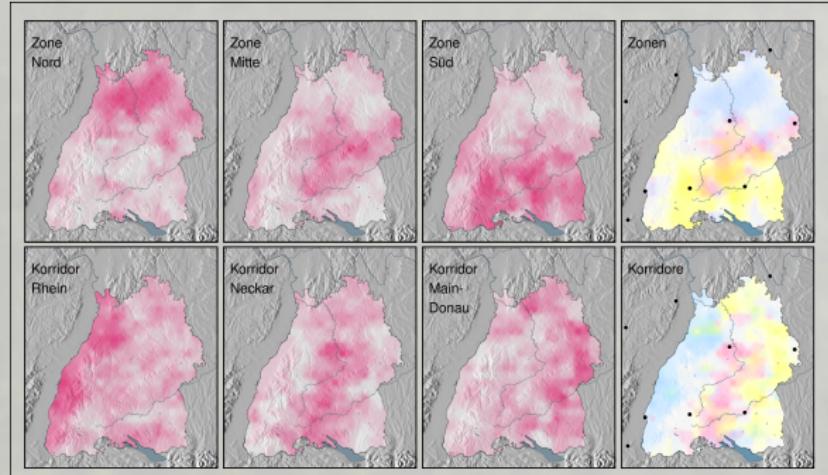
## Hunsrück-Eifel-Kultur

- ▶ same extent of different groups of material culture
- ▶ crisp border

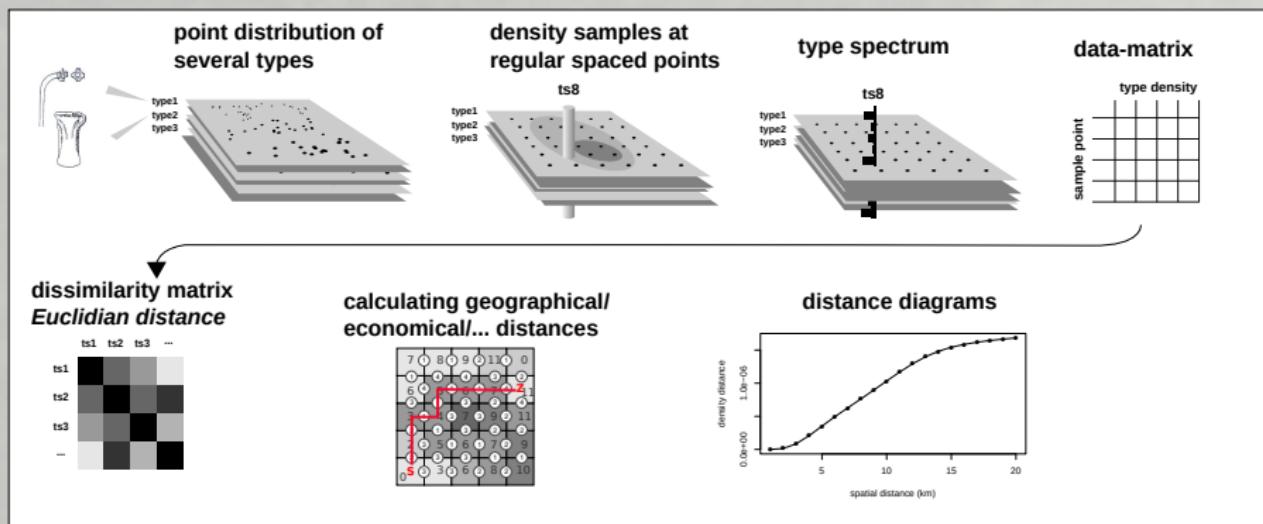


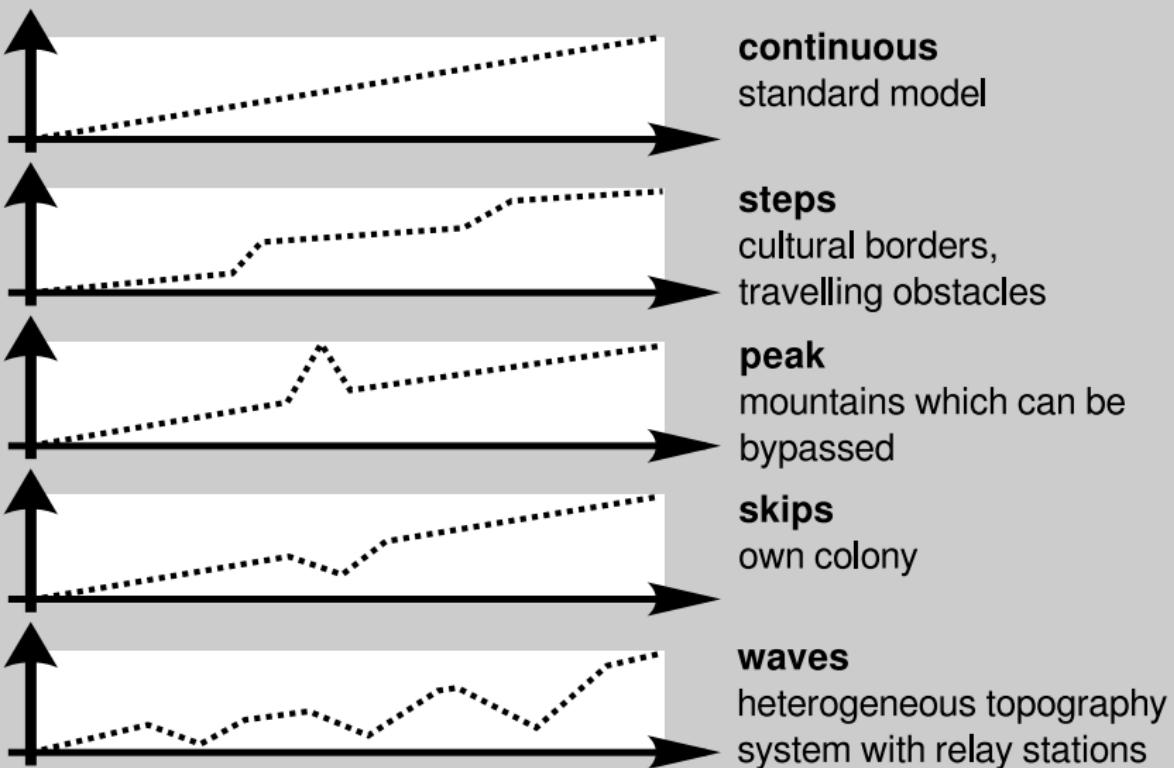
## Baden-Württemberg

- ▶ fuzzy borders
- ▶ overlapping cultural areas



# Methodology for interaction models / distance diagrams





Do you have other ideas for interpretation?

# Space

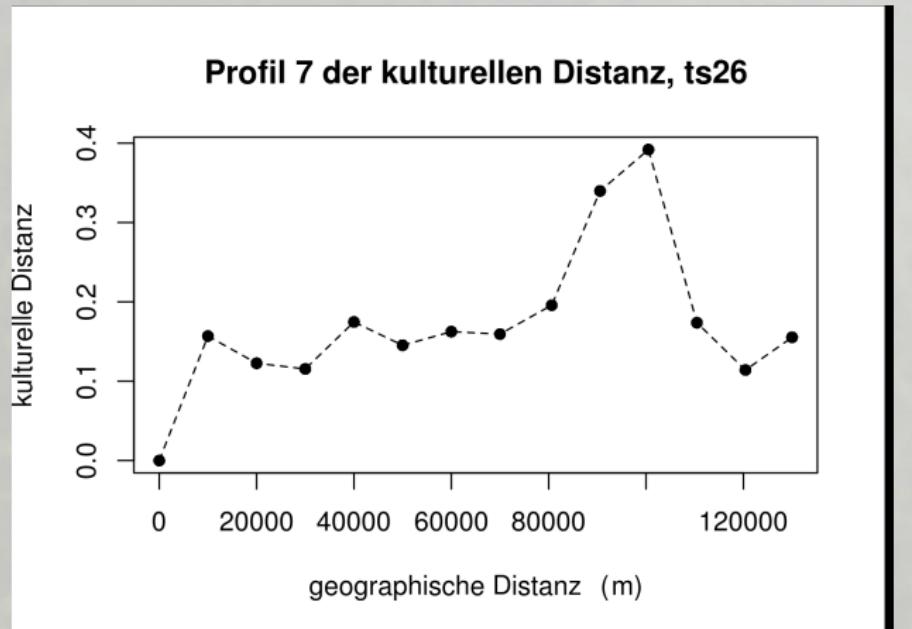
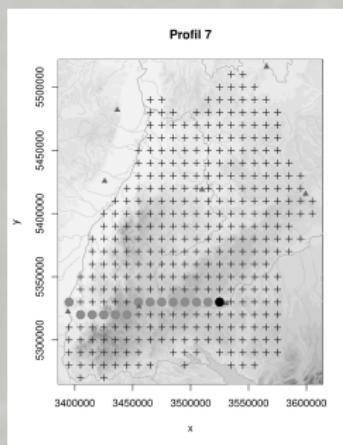
## Disciplinary spaces

A metrical space is spanned by a metric, which defines distances.

- ▶ A **social space** is constructed by social distances.
- ▶ An **economic space** is constructed by economic distances.
- ▶ A **cultural space** is constructed by cultural distances.
- ▶ A **geographic space** is constructed by geodetic distances.

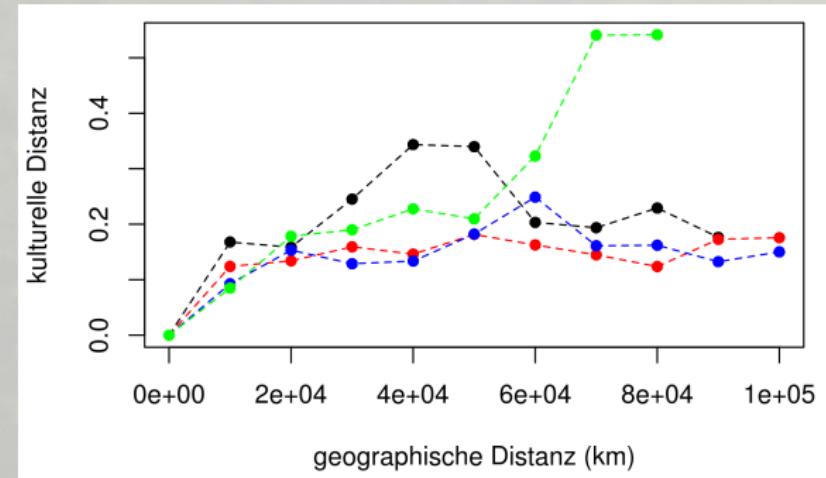
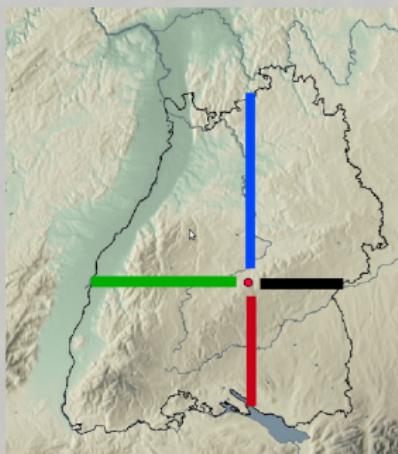
## Interaction model

- ▶ fixed starting point
- ▶ fixed profile
- ▶ ceramics
- ▶ interaction friction at Black Forrest?



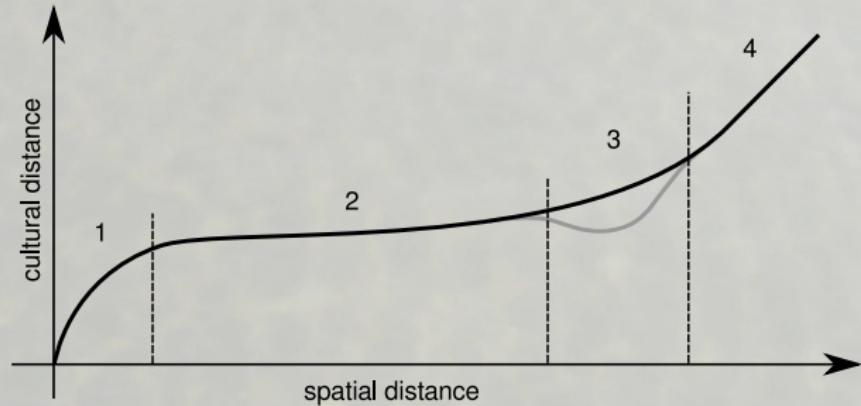
## Interaction model

- ▶ fixed starting point
- ▶ along the main axes
- ▶ ceramics
- ▶ rivers as interactive areas?



## Interaction model

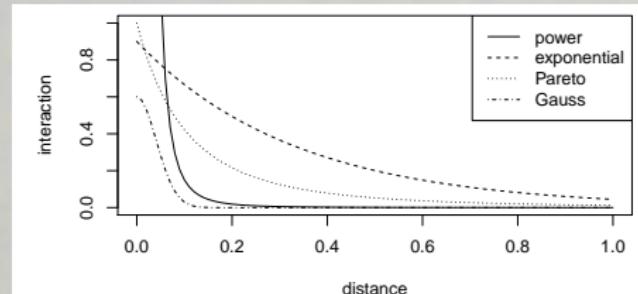
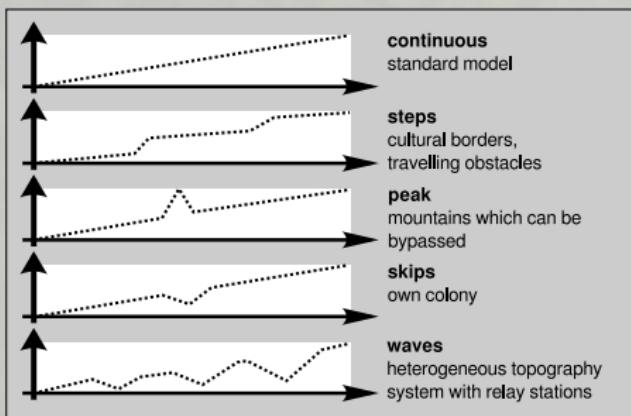
- ▶ from all points
- ▶ to all points
- ▶ fibulae and adornment
- ▶ interaction threshold at 200 km?



# Theoretical Models

**Interaction decreases with distance.**

Distance decay functions can quantify the decrease.



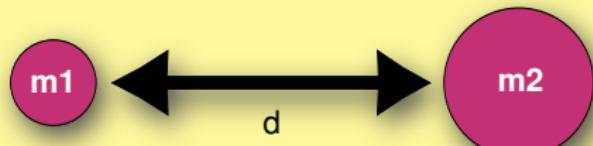
## Tobler's first law of geography

Everything is related to everything else, but near things are more related than distant things.

Tobler 1970

## Gravity models

- ▶ involve properties of the interaction partners
- ▶ based on an analogy from physics
- ▶ population, settlement size, ...
- ▶ can be used to produce distance decay functions/fall off curves, which consider population



$$I = \frac{m_1 m_2}{d^k}$$

# Distance diagram (dd)

- ▶ different view-points
- ▶ different focus-points
- ▶ cultural distance as an inverse interaction proxy

		fixed focus	selected focus	all focused
fixed point	view-	dd1 fixed profile dd, similarity profiles	dd2 fixed sector dd	dd3 fixed multi-focal dd, fall-off curve
selected viewpoints	view-	dd4 selected profiles dd	dd5 selected sector dd	dd6 selected multi-focal dd
all points	view-	dd7 aggregated profile dd	dd8 aggregated sector dd	dd9 aggregated multi-focal dd, variogram

# Complementary approaches

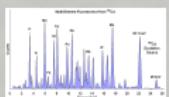
## Data



Sites



Artefacts



Chemical components

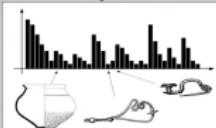
## Measures



Point distance

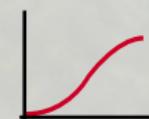


"Imports"

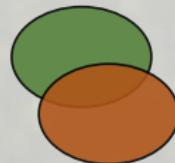


Cultural distance

## Models



Quantification

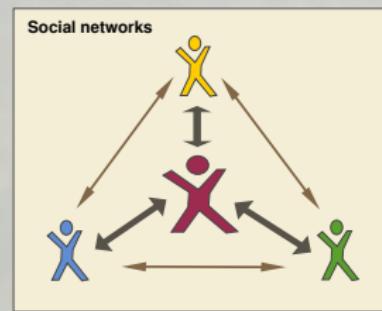
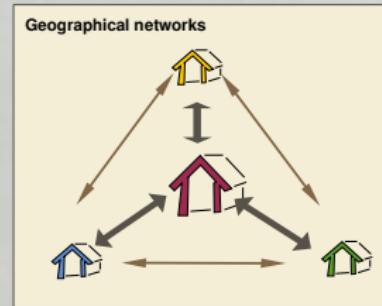
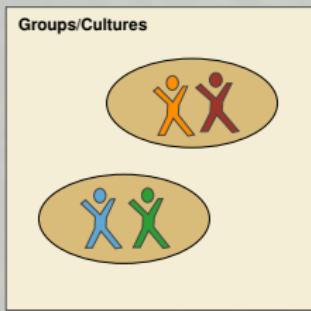


Regionalization

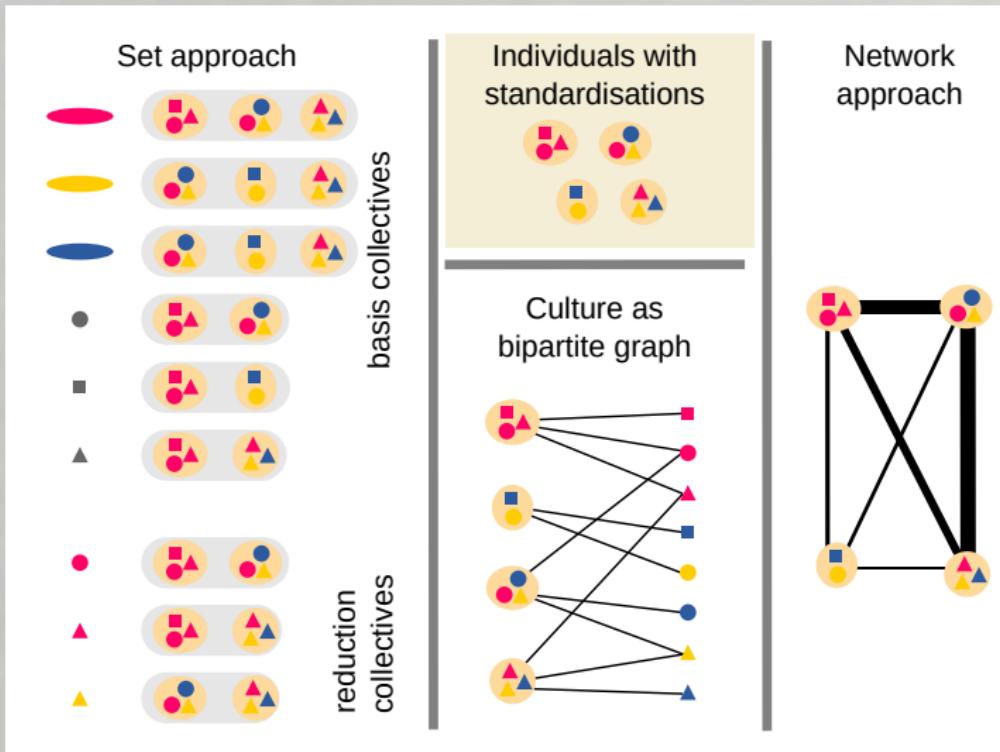


Connection

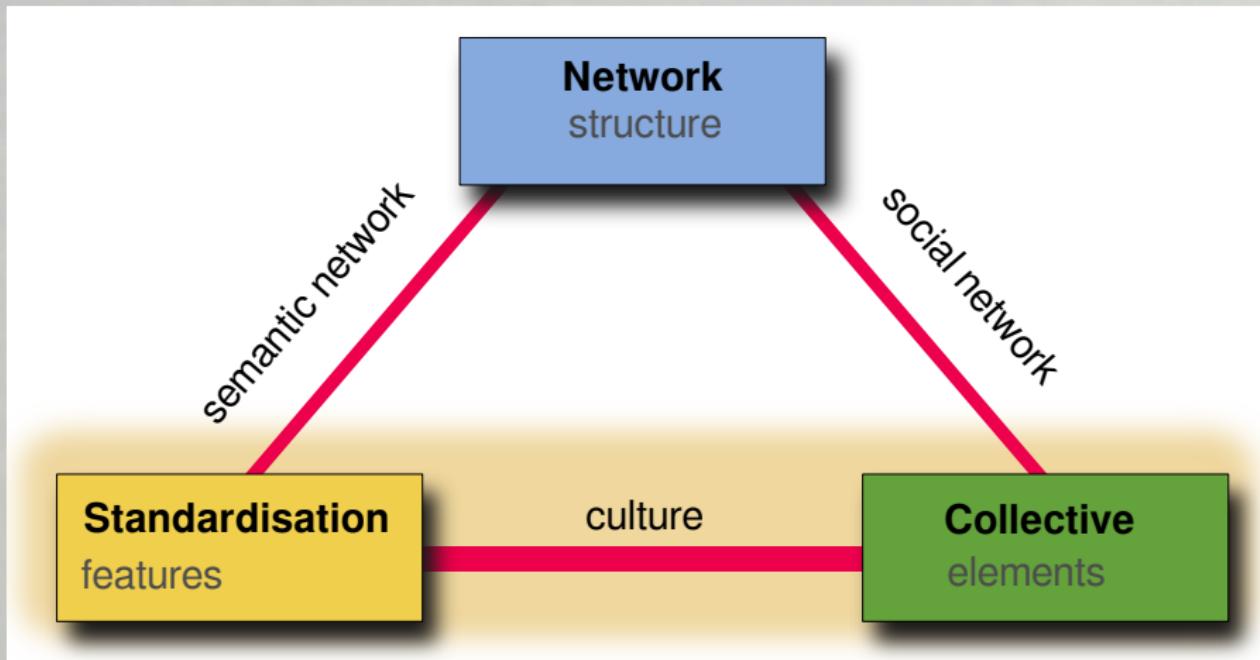
# Paradigm change towards networks



# Complementarity of sets and networks



# Concept of integration



# Conclusion

Cultural distances are:

- ▶ covered by up to date culture theory
- ▶ an inverse proxy of interaction
- ▶ a first common step for analysing
  - ▶ cultural areas
  - ▶ cultural networks
  - ▶ distant depended intensity of interaction
- ▶ much more appropriate for quantitative analysis than cultural markers
- ▶ ensuring reproducible and comparable results because of a formalized approach