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Testing the hypothesis on cognitive evolution of modern humans' learning ability: current status of past-climatic approaches.

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The impact of climate change on human evolution is important and debating topic for many years. Since 2010, we have involved in a general joint project entitled "Replacement of Neanderthal by Modern Humans: Testing Evolutional Models of Learning", which based on a theoretical prediction that the cognitive ability related to individual and social learning divide fates of ancient humans in very unstable Late Pleistocene climate. This model predicts that the human populations which experienced a series of environmental changes would have higher rate of individual learners, while detailed reconstructions of global climate change have reported fluent and drastic change based on ice cores and stalagmites. However, we want to understand the difference between anatomically modern human which survived and the other archaic extinct humans including European Neanderthals and Asian Denisovans. For this purpose the global synchronized change is not useful for understanding but the regional difference in the amplitude and impact of climate change is the information required. Hence, we invited a geophysicist busing Global Circulation Model to reconstruct the climatic distribution and temporal change in a continental scale. At the same time, some geochemists and geographers construct a database of local climate changes recorded in different proxies. At last, archaeologists and anthropologists tried to interpret the emergence and disappearance of human species in Europe and Asia on the reconstructed past climate maps using some tools, such as Eco-cultural niche model. Our project will show the regional difference in climate change and related archaeological events and its impact on the evolution of learning ability of modern humans.