Middle Pleistocene humans in Europe: cognition before Neanderthals

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Despite the ongoing debate about the complexity of the Neanderthal mind (Romagnoli, Rivals, and Benazzi, 2022), their cognitive development is now widely recognized in the scientific community. Neanderthals, initially perceived as primitive humans, were rehabilitated by the researchers and are now often considered cognitively very close to *Homo sapiens* (Otte, 2019; Slimak, 2019). On the basis of their complex technology, they are often supposed to have been capable of planning several steps ahead, thus displaying enhanced working memory capacity (Sykes, 2015). It is also hypothesized that Neanderthals also demonstrated some symbolic behavior by burying their dead and using pigments and ornaments (Dediu and Levinson, 2018). All these findings allowed researchers to suppose that Neanderthals may have possessed some kind of protolanguage, or even a recognizably modern language (Dediu and Levinson, 2018; Johansson, 2014, but see Berwick, Hauser, and Tattersall, 2013).

The situation is, however, different when it comes to the ancestors of Neanderthals. Indeed, the cohabitation of different human species is often referred to as "muddle in the middle." The discussions between paleoanthropologists about the number and origins of species in Europe in the early and mid-Middle Pleistocene are still ongoing (Dennell, Martinón-Torres, and Bermúdez de Castro, 2011; Athreya and Hopkins, 2021). *Homo heidelbergensis* is the most well-known early Middle Pleistocene species identified today in Europe (although the particular characteristics of the species are still debated), but arguably it was not the only one (de Lumley, 2015). In this poster, we present a comprehensive review

of the existing evidence about the cognitive capacities of *Homo heidelbergensis*, who most probably was the direct ancestor of Neanderthals (Di Vincenzo and Manzi, 2023). However, because of ongoing debates and the frequent impossibility of associating archaeological material with fossil records, it is often problematic to assign a particular archaeological collection to a particular species and thus to distinguish between the material cultures of potentially different species. Here, *Homo heidelbergensis* is used to refer collectively to early and mid-Middle Pleistocene humans in Europe. By comparing this evidence with what is already known about Neanderthals, we can better understand what cognitive capacities were potentially inherited and which were likely developed in this new species.

The possibility of the existence of a protolanguage before Neanderthals is discussed through a thorough review of existing arguments. We consider the arguments based on anatomical evidence and on the material culture left by those populations. Anatomical evidence shows that *Homo heidelbergensis* was right-handed (Faurie, Raymond and Uomini, 2016) and had a vocal tract similar to the Neanderthal one (Martínez et al., 2013), which might indicate brain specialization and a potential for speech. On the material culture side, we find elaborated habitat structures (de Lumley, 2006), complex Acheulean technology executed on different raw materials, and regionally distinguishable traditions by the end of the period (Carrión and Walker, 2019; Davis and Ashton, 2019), as well as occupation of northern Europe (Hosfield and Cole, 2018). These findings suggest an enhanced ability for planning (Hosfield and Cole, 2018), cultural transmission, and social organization (Ashton and Davis, 2021). Stout et al. (2014) suggest hierarchical behaviour organization. The analysis of these arguments leads to a better understanding of the evolution of the cognition of early humans populating Europe during the Lower Palaeolithic. After reviewing the *Homo heidelbergensis* evidence, we present a comparative section to contrast the arguments and better understand the cognitive evolution between the two species. In light of this newly emerged evidence, it's argued that the difference between the cognitive capacities of Neanderthals and their ancestors is rather a matter of degree, and to the extent that this is indicative of language (but see Bar-Yosef, 2017; Botha, 2011), to get to the origins of language, maybe we should take another step back in time and turn our attention to these earlier populations.

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