

## European hair and eye color A case of frequency-dependent sexual selection?

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Initial receipt 14 June 2004; final revision received 7 July 2005

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### Abstract

Human hair and eye color is unusually diverse in northern and eastern Europe. The many alleles involved (at least seven for hair color) and their independent origin over a short span of evolutionary time indicate some kind of selection. Sexual selection is particularly indicated because it is known to favor color traits and color polymorphisms. In addition, hair and eye color is most diverse in what used to be, when first peopled by hunter-gatherers, a unique ecozone of low-latitude continental tundra. This type of environment skews the operational sex ratio (OSR) of hunter-gatherers toward a male shortage in two ways: (1) men have to hunt highly mobile and spatially concentrated herbivores over longer distances, with no alternate food sources in case of failure, the result being more deaths among young men; (2) women have fewer opportunities for food gathering and thus require more male provisioning, the result being less polygyny. These two factors combine to leave more women than men unmated at any one time. Such an OSR imbalance would have increased the pressures of sexual selection on early European women, one possible outcome being an unusual complex of color traits: hair- and eye-color diversity and, possibly, extreme skin depigmentation.

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*Keywords:* Gender roles; Monogamy; Pigmentation; Polygyny; Sexual selection; Upper Paleolithic

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## 1. Introduction

Human hair and eye color is unusually diverse in a geographic area centered on the East Baltic and covering northern and eastern Europe (Figs. 1 and 2). Within this area, eyes are not only brown but also blue, gray, hazel, or green, while hair is not only black but also brown, flaxen, golden, or red (Beals & Hoijer, 1965, pp. 212–214). As one moves outward from this area, color diversity declines markedly with eyes becoming uniformly brown and hair uniformly black.

Is this diversity due to chance? In particular, could it reflect founder effects during the re peopling of glaciated Europe 15,000 to 10,000 years ago? When a founder group breaks off from its parent population, such “sampling” may indeed increase the frequency of a variant hair- or eye-color allele. It is less probable that two alleles of the same gene would become

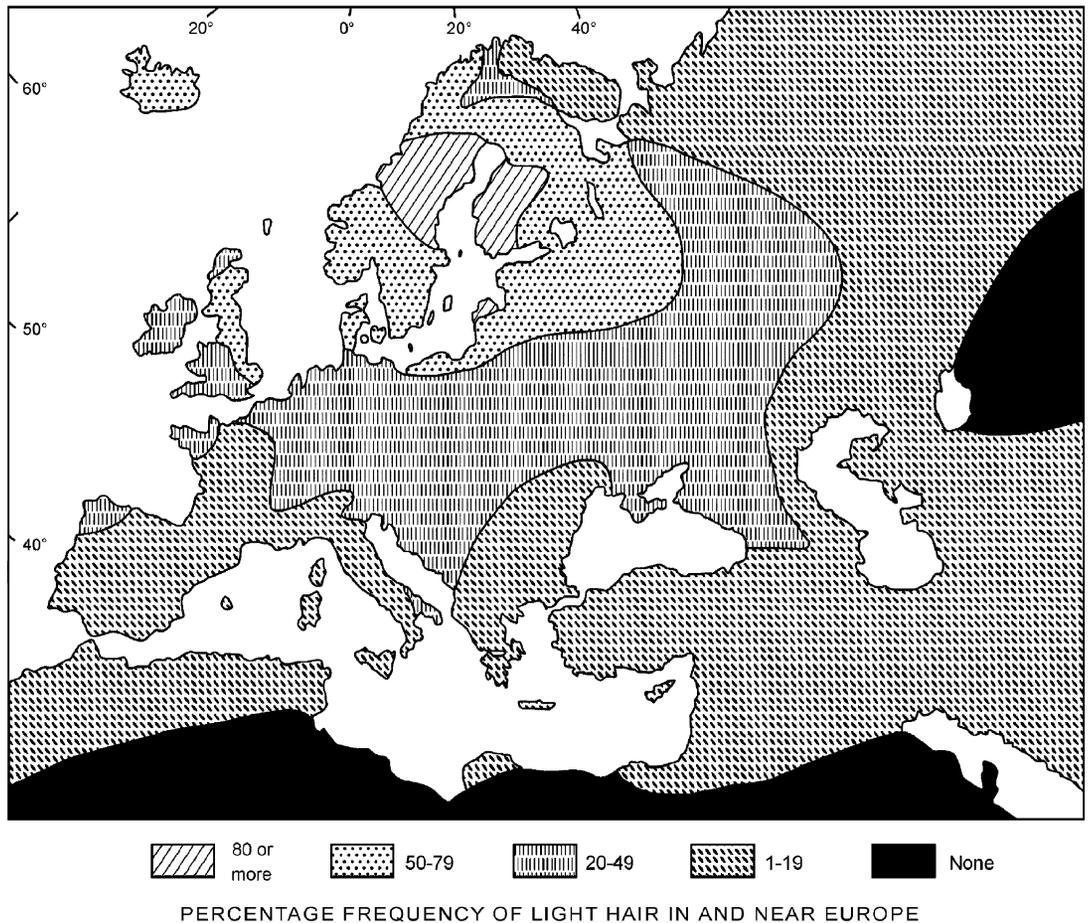


Fig. 1. Hair-color diversity in and near Europe (after Beals & Hoijer, 1965, p. 214). (Reprinted with permission from Beals et al., “An Introduction to Anthropology,” 3rd ed. Published by Allyn and Bacon, Boston, MA. Copyright © 1965 by Pearson Education.)

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