

Pitfalls of the Geographic Population Structure (GPS) Approach Applied to Human Genetic History: A Case Study of Ashkenazi Jews

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Abstract

In a recent interdisciplinary study, Das et al. have attempted to trace the homeland of Ashkenazi Jews and of their historical language, Yiddish (Das et al. 2016, Localizing Ashkenazic Jews to Primeval Villages in the Ancient Iranian Lands of Ashkenaz, *Genome Biol. Evol.* 8:1132–1149). Das et al. applied the geographic population structure (GPS) method to autosomal genotyping data and inferred geographic coordinates of populations supposedly ancestral to Ashkenazi Jews, placing them in Eastern Turkey. They argued that this unexpected genetic result goes against the widely accepted notion of Ashkenazi origin in the Levant, and speculated that Yiddish was originally a Slavic language strongly influenced by Iranian and Turkic languages, and later remodeled completely under Germanic influence. In our view, there are major conceptual problems with both the genetic and linguistic parts of the work. We argue that GPS is a provenancing tool suited to inferring the geographic region where a modern and recently unadmixed genome is most likely to arise, but is hardly suitable for admixed populations and for tracing ancestry up to 1,000 years before present, as its authors have previously claimed. Moreover, all methods of historical linguistics concur that Yiddish is a Germanic language, with no reliable evidence for Slavic, Iranian, or Turkic substrata.

Key words: population genetics, Ashkenazi Jews, Yiddish, geographic population structure, relexification.

Das et al. (2016) have recently presented an unorthodox interpretation of the history of Ashkenazi Jews, suggesting that they originated from a “Slavo-Iranian confederation”. This claim is essentially based on application of the geographic population structure (GPS) approach (Elhaik et al. 2014) to high-density autosomal single nucleotide polymorphism (SNP) data. GPS was used to infer geographic coordinates of populations supposedly ancestral to Ashkenazi Jews—

“primeval villages” (Das et al. 2016)—which were then interpreted at great length to support the Yiddish relexification hypothesis advanced earlier by one of the coauthors (Wexler 1991, 2002, 2010); an hypothesis that Yiddish was originally a Slavic language later remodeled completely under Germanic influence. In our view, there are major conceptual problems with both the genetic and linguistic components of the work. Below we argue that GPS is a provenancing tool, at best suited

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Study Of Population A Geographic Approach

PT Brinkman



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