

Tonogenesis as a Complementary Mechanism in the Structural Evolution of Sino-Tibetan Languages

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The origin of tone, known as *tonogenesis*, has fascinated researchers studying language evolution and human cognition for a considerable period. Linguistic investigations of tonal languages have proposed various hypotheses regarding the origin of tone[1-3], but these hypotheses have not been quantitatively tested in an evolutionary framework. In this study, we evaluated these tonogenetic hypotheses by conducting phylogenetic comparative methods[4, 5] with a Sino-Tibetan language dataset including a large-scale phylogeny and several tonogenetic potentials. Our results revealed a strong phylogenetic pattern in the distribution of tones and suggested that the Proto-Sino-Tibetan languages should be likely non-tonal. Moreover, we identified specific phonological structures, such as the loss of syllable-final consonants and voice quality on vowels, that were closely associated with the origin of tone. These associations were in line with the linguistic suggestion that phonological simplification could induce the origin of tonal contrast. Interestingly, we also found that the presence of several tonal features did not significantly affect the diversification rate of Sino-Tibetan languages. Collectively, our findings shed light on the nature of tone, revealing that it emerged as a compensatory mechanism to facilitate the structural organization and evolution of languages[6, 7]. This research contributes to a quantitative understanding of the origins and functions of tonal features within the broader context of language evolution and human cognition.

References

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