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# Letter shapes phonology: Feature economy and informativeness in 43 writing systems

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## Abstract

Differentiating letter shapes accurately is an increasingly crucial competence. Are letters as distinctive as they could be? We used a unique dataset of crowdsourced letter descriptions across 43 writing systems to produce a comprehensive typology of letter shapes for these diverse scripts. We extracted from 19,591 letter classifications, contributed by 1,683 participants, enough features to provide a unique description of all letters in each system. We show that scripts, compared to phoneme inventories, are feature-extensive: they use additional features to do what could be done with a lower number of features, used more efficiently. Compared to 516 phoneme inventories from the P-base dataset, our 43 scripts have lower feature economy (fewer symbols for a given number of features) and lower feature informativeness (a less balanced distribution of feature values). Letter shapes, we argue, having more degrees of freedom than speech sounds, use features in a more wasteful way.