One of the major goals of linguistics is to understand how aspects of language, from phonology to syntax, are shaped by the human cognitive system. In this talk, I will illustrate how experimental techniques can be used to test hypotheses linking individual-level cognitive biases to population-level typological tendencies in syntax and morphology. I will focus on two phenomena: noun phrase word order, and noun class/gender systems. In the first case, I will present evidence that biases in learning can explain why harmonic patterns—with modifiers consistently ordered on the same side of the noun—are more common typologically. In both adult and child learners, this bias is revealed by using an artificial language learning paradigm in which the input a learner receives mirrors the kind of linguistic variation found during periods of language change, contact, or emergence. In the second case, I will argue that experimental evidence can also be used to call into question the role of cognition in explaining typology. Here I showcase a different type of artificial language learning paradigm, in which learners are exposed to ambiguous input. Again, looking at both child and adult learners, I show that cross-linguistic tendencies in noun class/gender systems can be explained in part by the structure of the input, rather than properties of the learner. These two cases illustrate how experimental methods can reveal cognition-internal and external factors responsible for shaping the syntax and morphology of natural languages.