Language is a complex adaptive system that is both structured and variable. In this talk, I explore the question of how and with what consequences language use has an impact on language processing. In particular, I focus on distributional asymmetries between masculine and feminine grammatical gender, the resulting biases in gender assignment, and the consequences of these assignment strategies on gender expectancy and processing. I discuss the implications of the findings for the design of future gender processing studies and, more broadly, for understanding how experience shapes language processing.