This paper examines the relationship between tone and prosodic positions. I show that prosodic heads prefer higher tone over lower tone, while non-heads exhibit the opposite preference. These generalisations are expressed within Optimality Theory as a family of constraints in a fixed ranking. One set regulates the relation of tone to heads: *Hd/L » *Hd/M » *Hd/H; the other deals with tone on nonheads: *Non-Hd/H » *Non-Hd/M » *Non-Hd/L. These constraints are used to account for the stress system of Ayutla Mixtec: in this language, stress is attracted to a syllable based on its tonal content, but is also influenced by the posttonic syllable's tone. The implications of the theory for other tone-stress interactions - metrically influenced tone placement and neutralisation - are also examined.