This paper examines the historical development of certain modal constructions in Hup, a Nadahup (Makú) language spoken by a hunting/gathering people of northwest Amazonia. Most notably, the Hup Jussive (third person imperative/optative) has arguably arisen from an applicative, a typologically unusual source for a construction of this kind. In its turn, the Hup Jussive has produced an epistemic modal. These developments hinge on the remarkably polyfunctional etymon ūnh, which has two further, apparently related functions in the language, as a nominal kin term and an ‘interactional’ (reciprocal) prefix. The multiple transformations undergone by the ūnh etymon have been shaped by contact with the neighboring Tukanoan languages, which have arguably provided a model for several of the emergent constructions. The Hup case is noteworthy both in light of the complex series of transitions that have affected this etymon, and in the unusual nature of an applicative source for a modal. However, the Hup case also draws our attention to the fact that valence-changing operations are actually a relatively natural step in the grammaticalization of obligation modals, which often involves the introduction and subsequent backgrounding of a participant.