This master thesis addresses the problem of learning varying levels of abstraction of linguistic knowledge. The main focus is on learning latent semantic information as represented by frame classes, verb classes and role fillers by exploring recent successes in Bayesian modeling with hidden variables. Furthermore, close coupling of syntax and semantics is captured in the joint model which also incorporates valuable lexical information. The result is a language-independent, feature-less model of semantic information with a performance comparable to the current state of the art.