Recent studies use geometric morphometrics, the quantitative study of shape and its variation, to examine aspects of the archaeological record. This thesis builds on such applications by applying morphometrics to the analysis of whole ceramic vessels from the Casas Grandes culture of the Southwest. More specifically, I quantify variation in vessel shape and size, and find that Ramos and Babicora polychromes were likely made by specialists, but that other Casas Grandes ceramic types likely were not. This bolsters previous arguments for Medio period (A.D. 1200 to 1450) specialized production above the household level, but indicates that specialized production was limited to a subset of economically valuable goods.