Pedestrian-induced footbridge vibrations are an issue that bridge designers often have to contend with. A plethora of research in recent years has led to the development of load models and procedures that allow for the determination of footbridge response. Nonetheless, measured footbridge responses often deviate from those predicted. One of the main deficiencies of the existing models and guidelines is the exclusion of the effect of changes in the footbridge's dynamic properties due to the presence of pedestrians. More specifically, any change in mass and/or damping that a pedestrian might introduce to a bridge will affect the bridges overall dynamic response. This effect is an element of what is often referred to as human-structure interaction. In this paper, the results of an experimental study to determine the change in mass and damping of a vertically vibrating footbridge due to traversing pedestrians are presented. © The Society for Experimental Mechanics, Inc. 2013.