

The research presented is an empirical evaluation of the second author's proposed psychophysical theory (Luce, 2002a,b,c). It deals with the global percept of subjective intensity in which there is a psychophysical function Ψ that maps pairs of physical intensities onto the positive real numbers and represents subjective summation and a form of magnitude production. A number of behavioral properties have been shown to follow from specific representations of the several primitives of the theory and in the presence of structural conditions are sufficient for the representations. In a series of experiments, these properties are subjected to an empirical evaluation. The testing strategy is carried out in the auditory domain and concerns the subjective perception of loudness. Despite a number of methodological issues, considerable support is found for particular forms of Ψ for summations and magnitude productions.