

When the stimuli are described numerically, in terms of well specified physical scales such as length or mass, behavioral models can sometimes be strengthened by requiring that the response functions satisfy some reasonable invariance properties. This applies in particular to psychophysical applications of Norman Anderson's functional measurement. We show in this paper that the model used by Anderson to account for some experimental data pertaining to the size-weight illusion can be constrained by demanding that the response function be meaningful and dimensionally invariant. The resulting model is very specific and gives a good fit to Anderson's data.