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Theoretical Note: Recasting (the nearness to) Weber's Law

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In psychophysics, two measures of discriminability have been given much attention, with various arguments advanced promoting each. One is $\xi_v(x) = x + \Delta_v(x)$, which yields the stimulus intensity judged greater than stimulus intensity x with probability *v*, and the other is the so-called 'Weber function' measure $\Delta_v(x)$.

We argue two theses. First, in many psychoacoustic intensity discrimination experiments, $\xi_v(x)$ grows as a power function of x, the equation $\xi_v(x) = x^{\beta(v)} K(v)$ giving a fit to the data which is much better than the obtained for the near-miss equation $\Delta_v(x) = x^{\alpha(v)} C(v)$. The estimates of $\beta(v)$ are systematically smaller than 1 but noticeably higher than the corresponding estimates of the exponent $\alpha(v)$ of the near-miss equation. Second, these results imply, by a logical argument, that the exponent $\beta(v)$ of the power law must be nonconstant with *v* in all those common situations in which a particular averaging over conditions has taken place. Our arguments are mathematical and empirical, based on many well-known data.