In this talk I will describe how discontinuities introduced into otherwise smooth weights modify a pair of compatibility conditions first derived for smooth weights, $w_0(x)$. If $w_0(x) = \exp(-x^2)$, the Hermite weight, and

$$w(x) := w_0(x)(1 - \beta/2 + \beta \theta(x - t)), \quad -2 < \beta < 2$$

then $\alpha_n(t)$ the diagonal recurrence coefficient of the monic polynomials orthogonal with respect to $w$ over $\mathbb{R}$ solves a particular Painleve IV considered as a function of $t$. Asymptotic formulas for fixed $t$ and $n$ large are given. (Received August 13, 2004)