Compartmental DEs can be used to model the incidence of animal behavior; inflows and outflows correspond to initiations and cessations of behavior. If the probability distribution of a random variable $Y$ with mean $r$ belongs to a certain class of distributions, then $r$ can be transformed by a "link function" and regressed on environmental covariates. Such regression models are called "generalized linear models", or GLMs. If $r$ is the mean number of events (e.g., behavior changes) per "person-hour" or per "individual-time" from a Poisson process, then $r$ can be expressed as a function of environmental covariates using Poisson regression and incorporated into the DE model. If the log-transformed per capita rates of change in a DE model depend linearly on an environmental stimulus $x$ that intensifies uniformly in time, then the behavioral dynamics predicted by the DE can display threshold-type events in which the probability of behavioral change is nearly zero for some time but suddenly shifts to one as the environmental stimulus becomes sufficiently strong. We illustrate with a "stay/flee" conflict situation in which gulls continue to guard their territories as an eagle approaches but suddenly flee as the predator draws sufficiently near. (Received September 05, 2008)