1046-92-502 **Shandelle M. Henson*** (henson@andrews.edu), Department of Mathematics, Andrews University, Berrien Springs, MI 49104, and **James L. Hayward** (hayward@andrews.edu), Biology Department, Andrews University, Berrien Springs, MI 49104. *Modeling "stay/flee" conflict situations in animal behavior: Poisson regression and differential equations.* Preliminary report.

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)