1145-VF-2396   **John G. Alford*** (`jalford@shsu.edu`) and **William I. Lutterschmidt**
(`lutterschmidt@shsu.edu`). *From Conceptual to Computational: the Cost and Benefit of Lizard Thermoregulation Revisited.*

Endotherms (for example, humans) typically maintain body temperature via metabolic processes whereas ectotherms (for example, lizards) use behavioral thermoregulation in order to maintain body temperature. Examples of behavioral thermoregulation include shuttling between sun and shade and altering body posture. A classic paper published in 1976 in The Quarterly Review of Biology by Raymond Huey and Montgomery Slatkin presented a mathematical model of the benefits and costs of behavioral thermoregulation to predict the optimal thermoregulatory strategy of a lizard. Their paper has served as the theoretical foundation for hundreds of investigative studies. Huey and Slatkin used strictly qualitative methods to analyze their model. We analyze the Huey and Slatkin model using both theoretical and computational methods and demonstrate both the utility and inherent accuracy of their qualitative analysis. However, our results also reveal some interesting new insight into the model. For example, contrary to Huey and Slatkin's predictions we show that perfect thermoregulation is never an optimal strategy and that an ectotherm may behaviorally thermoregulate more often with increasing cost. (Received September 25, 2018)