MS Thesis Defense

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ABSTRACT

Climate and weather affect an animal's distribution, food availability, activity patterns, and ultimately their reproductive success and survival. The means by which a species manages in different conditions is central to thoroughly understanding its ecology, evolution, and conservation. As we face a warming climate, developing a more comprehensive picture of an animals' energetic (specifically, thermal) limitations is critical. Maintaining an internal thermal balance is essential to endotherm survival and the tradeoffs of time and energy for thermoregulation can permeate all aspects of an animal's life. While temperature is the primary parameter governing the thermal state, there are also many interacting forces, such as water availability, wind, and exposure to solar energy, that affect thermoregulation. Solar energy's influence on thermoregulation is assumed and often mentioned in research but has rarely been measured. Because behavioral adaptation can be one of an animal's most critical tools for surviving in a changing and highly variable climate, behavior patterns in relation to environmental conditions such as solar energy serve as a central way to assess animal response to climate change. To investigate this fundamental yet overlooked aspect of environmental influence on populations, we conducted a shade manipulation experiment with free ranging House Sparrows, *Passer domesticus*, to better understand the effects of solar energy, at high summer temperatures, on animal behavior. Attendance was modeled in relation to biotic and abiotic environmental conditions. An interaction between temperature and the amount of shade was important in explaining house sparrow attendance demonstrating the complexity of the thermal pressures on an animal. This study shows that as we continue to assess and predict how animals have and will respond to climate change, we should incorporate behavior and also quantify additive thermal pressures such as solar energy in order to better measure an animal's niche and apply our knowledge to conservation.