# Collective Behavior and Coastal Health: How Individual Personality Influences Population Mortality in a Marsh Ecosystem Predator-Prey Interaction

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Salt marsh ecosystems provide a multitude of critical ecosystem services and are dominated by the cordgrass, Spartina alterniflora. Littoraria irrorata, the marsh periwinkle, is an important consumer in salt marshes and can directly influence marsh health, primarily through its interaction with its main predator, the blue crab, Callinectes sapidus. The trophic cascade imposed by this predator plays an important role in regulating Spartina productivity and this interaction is thus an important driver in structuring ecological communities. Here I test the influence of individual personality and social context on the survival of L. irrorata when exposed C. sapidus. Many studies that have considered the broader ecological implications of animal personality have failed to account for the moderating effect of social context. Group personality may be key in determining how individuals interact in their environment, as the collective actions of social groups are shaped by a group's behavioral composition. Overall, I found that individuals varied along a bold-shy continuum. When snails were partitioned into groups that varied in personality, survival differed significantly. Groups of all shy individuals had the lowest survival, while groups of all bold individuals had the highest. Importantly, mortality in the mixed groups was strongly dependent on the presence of bold individuals, which effectively decreased mortality in the shy individuals. I demonstrate that the effect of personality on prey avoidance is conditional on group personality, indicating that social context can greatly impact the survival and success of its individual members, which has broad implications for community dynamics and coastal health.

**Awards Won:**

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