Abstract

Thesis Project: Mechanosensory communication during reproductive interactions in fishes: the importance of animal-generated hydrodynamic flows

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The lateral line system of aquatic vertebrates is composed of neuromast mechanoreceptors along the head and body that detect movement through vibration and pressure gradients in the water. Although mechanosensory information has been shown to be important in the contexts of predator escape and foraging, little is known about the role of the lateral line in intraspecific interactions such as reproduction. Many species of fish have complex courtship and aggressive repertoires that involve movement of the body and fins, resulting in local displacement of the surrounding water. This displacement has the potential to function as a signal that contains information about the sender. In this study, I conducted two behavioral experiments using fathead minnows (*Pimephales promelas*) to test the hypothesis that the outcomes of male-male contests and male-female courtship interactions are influenced by animal-generated hydrodynamic flows. In my first experiment, I pitted control males against those with ablated lateral lines and assessed both overall aggression and the likelihood of territory acquisition. In my second experiment, I conducted dual-choice, female mate-choice experiments to determine whether control females and those without access to mechanosensory information (ablated females) differed in discriminatory ability and use of courtship as a criterion of choice. In experiment 1, control males won a significantly greater proportion of territorial contests than expected by chance and were more likely to use non-contact threat displays during aggressive interactions compared with ablated males. In experiment 2, females with access to the mechanosensory information channel showed enhanced mate discrimination compared to ablated females. These data are some of the first to show that mechanosensory signals are an

important criterion of territorial and reproductive success in fishes and contribute to multimodal communication in this group.