

Scientific Paper:

Behavioral Ecology and Sociobiology (2022) 76: 47

Responsiveness to contest experiences is associated with competitive ability but not aggressiveness or boldness

Yu-Ju Chen^{1,2}, Yu-Ting Chang¹, Yung-Che Tseng³, Yuuing Hsu¹

¹School of Life Science, National Taiwan Normal University, Taipei, Taiwan

²Biodiversity Program, Taiwan International Graduate Program, Academia Sinica, No. 128, Sec. 2, Taipei, Taiwan

³Marine Research Station, Institute of Cellular and Organismic Biology, Academia Sinica, No. 23-10, Taiwan

Abstract:

Many animals raise and lower aggressiveness after recent wins and losses, respectively. Individuals that differ in internal/external conditions could also differ in their responsiveness to winning and/or losing experiences. Personality traits have been suggested to have close links with an individual's responsiveness to environmental stimuli. Whether the responsiveness to winning-losing experiences is related to personality traits, however, remains unclear. Using a mangrove killifish, this study tested the hypothesis that personality traits (aggressiveness and boldness) and responsiveness to winning/losing experiences are linked because of their common associations with competitive ability. We also measured oxygen consumption rates to evaluate the importance of energy supply to the responsiveness. The results showed that aggressiveness, but not boldness or oxygen consumption rate, was associated with competitive ability and affected by winning/losing experiences. The fish's responsiveness to winning-losing experiences was dependent only on competitive ability, but not aggressiveness or boldness; individuals with better (instead of worse) competitive abilities showed greater decreases in aggressiveness in response to losing experiences. The strong signals from multiple losing experiences together with worse competitors also exhibiting low aggressiveness (floor effects) may have given rise to these unpredicted results. Furthermore, (1) aggressiveness, boldness and oxygen consumption rate were positively correlated both before and after experience treatments and (2) individuals that were bolder or had higher oxygen consumption rates had higher increases in aggressiveness after experience treatments, consistent with the notion that individuals that are able to pay high metabolic costs can afford to behave boldly and aggressively and to raise aggressiveness further.

Keywords: personality, aggressiveness, winning-losing experience, responsiveness, *Kryptolebias marmoratus*