

Better the devil you know: familiarity reduces contest aggression in spiders

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Animals fight over mates, social rank, food and territories. However, fighting takes energy and is dangerous. Therefore, we expect individuals to be less aggressive toward familiar than unfamiliar individuals as familiar individuals have established dominance rank. Many species follow this pattern of aggression (called the 'dear enemy effect'), with research effort concentrating on vertebrates. The dear enemy effect prevents unnecessary fighting but requires complex cognitive processes, including accurate risk assessment, individual recognition and memory. We decided to test the dear enemy effect in daddy long-legs spiders (*Pholcus phalangioides*) - highly aggressive spiders with small brains. We placed spiders into paired training boxes to familiarise for three days. The boxes allowed passive flow of chemical cues between the spiders, but no physical contact. On the fourth day, spiders were placed into either a 'familiar' or 'unfamiliar' contest treatment. Familiar spiders were placed in staged contests with their training partner. Unfamiliar spiders were placed in staged contests with a spider that they were not trained with. We filmed interactions for one hour and checked spiders for cannibalism and position the following morning. Familiarity had no effect on whether or not a contest occurred, but contests were more violent between unfamiliar individuals. This indicates that spiders are capable of complex cognitive processing to reduce the risk of injury, or death, during contests.

