

Differences in personality influence survival in field crickets

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A cricket in front of its burrow. For identification, the researchers marked it with a bright spot on its back. Credit: MPI f. Ornithology

An individual's behaviour in risky situations is a distinct personality trait both in humans and animals that can have an immediate impact on longevity. Researchers from the Max Planck Institute for Ornithology in Seewiesen have now found differences in personality types for the first time in a population of free living field crickets. Risk-prone individuals showed a higher mortality as they stayed more often outside their burrow where they can be easily detected by predators, compared to risk averse individuals. Moreover, shy individuals are not encountered so often by researchers, causing potential bias in collected scientific data. This methodological problem has been a neglected in many personality studies but has been accounted for uniquely in the present study.

Animals, like humans, have distinct personalities that are partly defined by genes and partly shaped by the environment. Personality as a phenomenon means that some individuals are consistently more shy, bold, cautious or aggressive compared to others. During the last decade, different individual

[personality](#) patterns have been detected in more than 100 animal species and found to be related to important life history traits such as reproductive success and survival.

Studying personality in the wild is important since it ensures that the behavioural expression as well as ecological data (such as longevity) are collected in a natural environment and thus not affected by artificial experimental setups used in the laboratory. Most studies of the relationships between personality and survival have been conducted on established vertebrate models such as mammals and songbirds and there are few studies, if any, on invertebrates in wild populations.

Scientists, led by Niels Dingemans, from the Max Planck Institute for Ornithology in Seewiesen and the Ludwig-Maximilians-University in Munich have investigated the personality and survivorship in wild [field crickets](#). Within a 120 m² fenced-off meadow, cricket nymphs were individually marked and monitored until they reached adulthood in order to study their individual behaviour and survival. For example, flight initiation distance, i.e. distance when crickets initiate the escape of an approaching threat, was determined by tapping a round wooden pole on the ground towards the cricket's burrow mimicking natural ground predators that prey on this insect. Together with the measurement of the maximum distance that crickets moved away from their burrows these behaviours were used to define whether crickets express personalities. As predicted, bold behaviours varied consistently between individuals, verifying the presence of personality.

Bold field crickets suffered from higher mortality compared to less bold ones probably because they are preyed upon by natural predators such as shrews and birds more often compared to shy individuals. Furthermore, bold individuals were more easily detected by the observer which likely represents the mechanism for their higher mortality:

predators can detect bold individuals more easily. To verify that observers did not simply miss the shy individuals, the researchers fenced the burrows and repeated the measurements.

"These differences in the encounter rates between bold and shy individuals should be considered in future studies investigating relationships between personality and fitness in natural populations", says Petri Niemelä, first author of the study.

More information: Petri T. Niemelä, Ella Z. Lattenkamp, Niels J. Dingemanse, Personality-related survival and sampling bias in wild cricket nymphs, *Behavioral Ecology*, advanced online publication 22 April, 2015

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