LAY SUMMARY

Behavioural predictability describes individual variation in behaviour. Unpredictability can arise via non-adaptive passive plasticity, in which an environmental factor acts directly on the individual to create non-adaptive phenotypic variation. My field study showed that Cook Strait giant weta *Deinacrida rugosa* (Orthoptera: Anostostomatidae) exhibit a sex difference in the predictability of their nightly travel distance due to passive behavioural plasticity. Female mobility was less predictable than female mobility. Females travel short and predictable distances each night for food and refuge that are close by and readily available. In contrast, male travel is less predictable because they search for female mates stochastically dispersed across the landscape. Therefore, the travel distances of individuals can vary considerably across nights.