Social conformity in solitary crabs, *Carcinus maenas*, is driven by individual differences in behavioural plasticity

Ines Fürtbauer*, Amanda Fry

Department of Biosciences, College of Science, Swansea University, Swansea, U.K.

Group living is widespread in the animal kingdom and recent studies into the mechanisms underlying group cohesion and behavioural synchrony have highlighted the importance of between-individual behavioural differences ('animal personality'). In group-living animals, social conformity occurs when animals compromise their own behaviour to the level of a certain behaviour displayed by another individual or a group, and the degree to which individuals conform can depend upon interindividual differences in behavioural types. Social conformity can increase group cohesion and ultimately predator avoidance and/or resource acquisition for group-living individuals. However, it remains unclear whether similar conformity effects exist in solitary species, many of which form temporary aggregations and, if so, whether changes in behaviour in the presence of conspecifics are dependent on individuals' personalities in solitary contexts. We studied the effects of social context (i.e. the presence of a conspecific) on behaviour in solitary shore crabs, using automated video tracking. Individuals differed consistently in their activity levels within and across contexts and were significantly more active in solitary than dyadic contexts. No differences in activity between same- and opposite-sex dyads were found. Crabs' activity levels were more similar when tested together than when tested alone, indicating a social conformity effect. Furthermore, more active behavioural types decreased their activity to a greater extent when paired with a conspecific. The sex composition of the dyad had no effect on changes in activity. Overall, our findings suggest that social conformity is moderated by individual behavioural differences in a solitary organism. It is often presumed that, over evolutionary time, the social structure of animal populations has important consequences for the evolution of personalities and vice versa. We suggest that studying solitary or facultatively social organisms may allow researchers to tease out causality between personality differences and socioecological dynamics.
individual personalities (e.g. Guayasamin, Couzin, & Miller, 2017; Magnhagen & Bunnefeld, 2009; Fig. 1).

Social conformity effects and associated influences of personality expressed in isolation have been reported in many social species, including vertebrates and invertebrates (e.g. Dussutour, Nicolis, Despland, & Simpson, 2008; Herbert-Read et al., 2013; King, Williams, & Mettke-Hofmann, 2015; Koski & Burkart, 2015; Magnhagen & Bunnefeld, 2009; McDonald, Rands, Hill, Elder, & Ioannou, 2016; Schuett & Dall, 2009; Webster, Ward, & Hart, 2007; reviewed by Webster & Ward, 2011), and may be beneficial for predator avoidance, resource acquisition or facilitation of mating (reviewed by Krause & Ruxton, 2002). In perch, Perca fluviatilis, for instance, individuals are bolder when in a group than when tested in isolation, with bolder fish exhibiting the smallest change in behaviour and 'conforming' to a lesser extent (Magnhagen & Bunnefeld, 2009; see Fig. 1c). Sticklebacks, Gasterosteus aculeatus, are more active and resume foraging more rapidly following a simulated predator attack when tested in groups than when tested alone (Webster et al., 2007), and their individual personality is 'suppressed' when making consensus decisions about foraging (McDonald et al., 2016). Nutmeg mannikins, Lonchura punctulata, in contrast, exhibit consistent between-individual differences in behaviour irrespective of group size (Rieucau, Morand-Ferron, & Giraldeau, 2010).

In addition to sociality, group composition and the behavioural type of social partners can also affect conformity (e.g. Dussutour et al., 2008; King et al., 2015; Schuett & Dall, 2009; reviewed by Webster & Ward, 2011). For example, colonies of social caterpillars, Malacosoma disstria, are less cohesive when comprising a majority of active (as opposed to inactive) behavioural types (Dussutour et al., 2008). In Gouldian finches, Erythura gouldiae, shy birds take more risks when paired with a bolder conspecific, and bold birds take fewer risks when paired with a shyer conspecific (King et al., 2015). Similarly, in zebra finches, Taeniopygia guttata, individuals are more exploratory when paired with a more exploratory conspecific (Schuett & Dall, 2009). Furthermore, in numerous species, conformity is more pronounced between members of the same sex, due to different activity budgets and motivation in males and females ('sexual segregation'; for reviews see e.g. Rockstuhl & Neuhaus, 2006; Wearmouth & Sims, 2008).

Generally, when researchers investigate the effects of social conformity, they tend to use a group-living species, and observe behaviour for individuals (1) in isolation and (2) in pairs/groups (see above). The inference is that the behaviour when solitary (personality) is ‘altered’ by the presence of others. This approach offers much insight but, in our opinion, may be problematic since the ‘normal’ state for group-living individuals is to be with others; the unusual situation is to be alone. We would thus argue that social conformity effects (in group-living species) may be better understood as responses to the removal of others, that is, a reaction to being a singleton. In contrast, one could study the effect of conspecific presence (not absence) in solitary species which only form temporary aggregations at resources or during mating.
دریافت فوری
متن کامل مقاله

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات

ISIArticles
مرجع مقالات تخصصی ایران