



## What triggers the decline of social tolerance in solitary spiders?

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Social life is not always permanent and many species of invertebrates display transient forms of sociality during their lifecycle. Understanding the mechanisms driving the shift from a social to a solitary life during ontogenesis can provide insights into the mechanisms that might have favored the transition to perennial sociality. Spiders are relevant models to address this question. Indeed, all solitary spiders have a transitory gregarious phase during their earliest developmental stages and both solitary and social species are included within the same genus. The mechanisms underlying the decline of aggregation and the onset of dispersal are however not yet well understood. Here, we investigated how early social experience influenced the decline of social tolerance and the initiation of agonistic interactions in spiderlings of the solitary spider *Agelena labyrinthica*. Spiderlings were maintained alone or in groups for variable durations and they were then tested in pairs to quantify the levels of aggression and to record the occurrences of cannibalism. Five days after their emergence from the maternal cocoon, spiderlings from both treatments displayed only amicable interactions. After this period however, an increase in the duration of social isolation leads to a dramatic increase in the rate of cannibalism that reached up to 80% after 20 days. This strongly contrasted with spiderlings maintained in groups that showed almost no aggression. We also tested pairs comprising one individual from each treatment and we found that spiderlings with no social experience were almost always the most aggressive individual. Contrary to the common belief that the aggression precedes dispersal in spiders, our results therefore indicated that dispersal is rather a cause than a consequence of the loss of tolerance. Overall, this study opens new perspectives for understanding the evolution of sociality in spiders.