

Commentary

The piglet case: commensalism as a distinct category of intraspecific animal relationships

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Summary

1. Interspecific relationships, termed symbiosis, are considered very diverse, while intraspecific relationships have just two categories.
2. The present classification fails to define all interactions among members of the same species, as demonstrated by observations of suckling behaviour in pigs.
3. Supporting latest findings on the suckling behaviour of piglets, I propose an extension of the classification for existing intraspecific animal relationships by adding a new distinct category: commensalism.

Keywords:

commensalism, intraspecific animal relationship, pig, siblings, suckling behaviour

Introduction

Relationships among organisms are separated into two main categories: interspecific (between species) and intraspecific (within species). Interspecific relationships, termed symbiosis (Martin & Schwab 2013), are considered very diverse, and include proto-cooperation (+/+; facultative, not obligatory, cooperation) and mutualism (+/+) – both represent cooperative relationships, and antagonism (-/-), agonism (+/-; including parasitism and predation), amensalism (0/-), neutralism (0/0; if it exists in nature at all), and commensalism (+/0) (Martin & Schwab 2013). Intraspecific relationships have just two categories: cooperation (+/+) and competition (+/-). Supporting latest findings on the suckling behaviour of piglets, I propose an extension of the classification for existing intraspecific animal relationships by adding a new distinct category: commensalism (Fig. 1). The present classification, namely, fails to define all interactions among members of the same species, as demonstrated by observations of suckling behaviour in pigs.

The piglet case

The suckling behaviour of domestic pigs is a dynamic process, within which both major types of intraspecific relationships operate. Cooperation is clearly manifested as the mutual stimulation of the mammary glands (udder), which must be vigorous and long enough to trigger the release of oxytocine and prolactine (Drake, Fraser & Weary 2008), resulting in milk outflow. Of note, piglets must (and normally do) suckle simultaneously to provide sufficient massage. Competition among piglets for the limited colostrum and an access to the nipple is highly expressive and intensive particularly at the beginning of lactation (first few days).

This competition ceases after teat order (i.e., piglet tendency to suckle at the same teat) is established. However, latest study on domestic piglets (Skok 2016) identified a relationship that cannot be defined as cooperative (prosocial) or competitive, but rather commensal (+/0).

Until the current study, this relationship has not been considered or described in the context of intraspecific relationships.

In brief, the results of the current study (Skok 2016) suggest that *“surviving weaklings tended to have the heaviest littermates as nearest neighbours during suckling.”* Furthermore, because *“vigorous massage might stimulate higher milk production in the surrounding glands, it is possible that a weakling’s survivability is conditioned also by suckling at a position adjacent to heavier littermate”*. According to the study (Skok 2016) *“it appears that weaklings which establish a type of commensal, rather than competitive, relationship with strongest siblings might increase their survivability.”*

Therefore, weaklings which are limited in terms of mammary gland stimulation, might take advantage (+) of vigorous massage implemented by the heaviest siblings, who, in turn, do not suffer any costs from this activity (0). This type of relationship could be characterised solely as a commensalism.

Indeed, in the case of suckling behaviour by piglets, cooperation and competition are not distinct categories, because competition is interspersed with cooperation, and *vice versa*, which forms part of the comprehensive discussion on fighting during suckling (Hudson & Distel 2013; Skok & Škorjanc 2014; Hudson 2014). Therefore, the introduction of commensalism as an additional category in the classification of intraspecific relationships among animals might mitigate ambiguity, as this or similar behaviour probably also occurs in other species.

In conclusion, I call for ethologists and animal ecologists to discuss this topic and/or present more examples of intraspecific relationships that do not fit current classification.

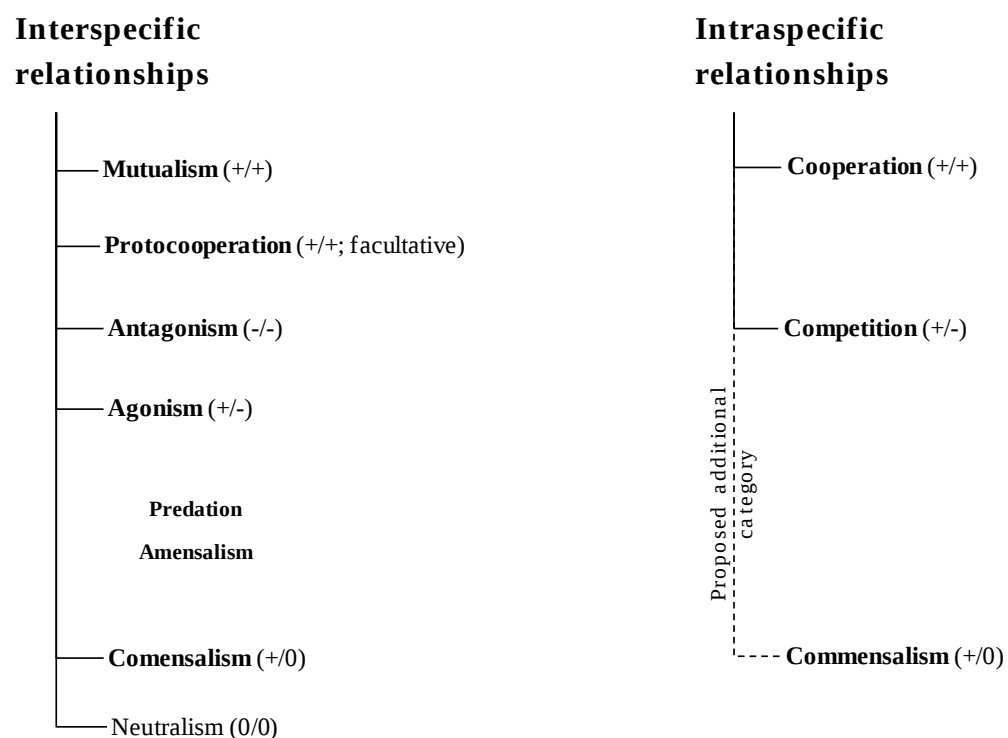


Fig. 1

Basic schematic of inter- and intraspecific relationships with commensalism added to the list of intraspecific relationships.

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