

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

*Janko Skok*

University of Maribor, Faculty of Agriculture and Life Sciences, Department of Animal Sciences, Pivola 10, 2311 Hoče, Slovenia

Correspondence: [janko.skok@um.si](mailto:janko.skok@um.si)

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

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 [2], 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) has been established. However, a recent study on domestic piglets [3] identified a relationship that cannot be defined as cooperative (prosocial) or competitive, but rather commensal (+/0).

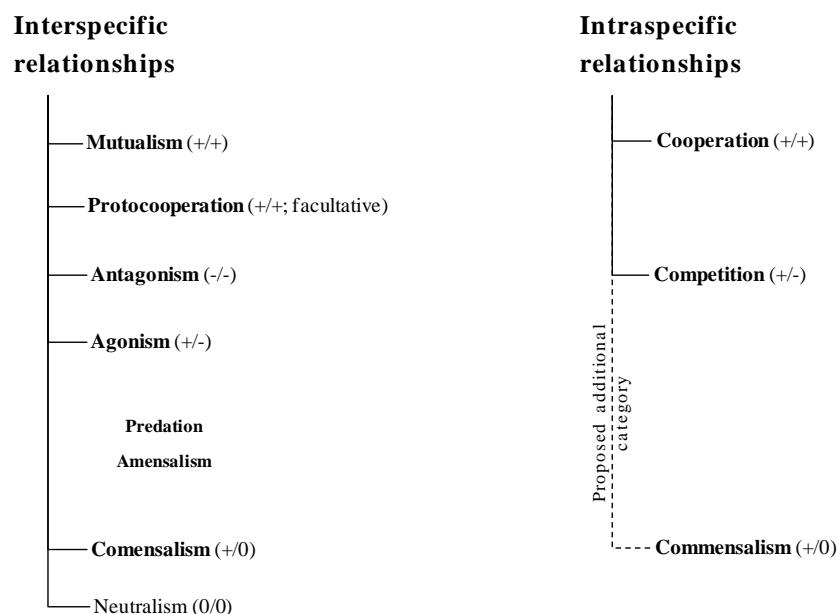
Until the current study, this relationship has not been considered or described in the context of intraspecific relationships.

In brief, the results of the current study [3] 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 [3] “*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 [4,5,6]. 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 present more examples of intraspecific relationships that do not fit current classification.



**Fig. 1**

Basic schematic of inter- and intraspecific relationships with a new category (commensalism) added to the list of intraspecific relationships.

# References

1. Martin BD, Schwab E. 2013. Current usage of symbiosis and associated terminology. *Int. J. Biol.* 5, 32–45. doi: <http://dx.doi.org/10.5539/ijb.v5n1p32>
2. Drake A, Fraser D, Weary DM. 2008. Parent–offspring resource allocation in domestic pigs. *Behav. Ecol. Sociobiol.* 62, 309–319. doi:10.1007/s00265-007-0418-y
3. Skok J. *In press*. Being a weakling and surviving: keep the fittest siblings close-by when eating. *Behav. Process.* doi: 10.1016/j.beproc.2016.10.010
4. Hudson R, Distel H. 2013. Fighting by kittens and piglets during suckling: What does it mean? *Ethology* 119, 353–359. doi: 10.1111/eth.12082
5. Skok J, Škorjanc D. 2014 Fighting during suckling: is it really an epiphenomenon? *Ethology* 120, 627–632. doi: 10.1111/eth.12251
6. Hudson R. 2014. Behavioral epiphenomena revisited: reply to Skok and Škorjanc. *Ethology* 120, 739–741. doi: 10.1111/eth.12264