

These little piggies helped their neighbors, but why? New research design may help shed light

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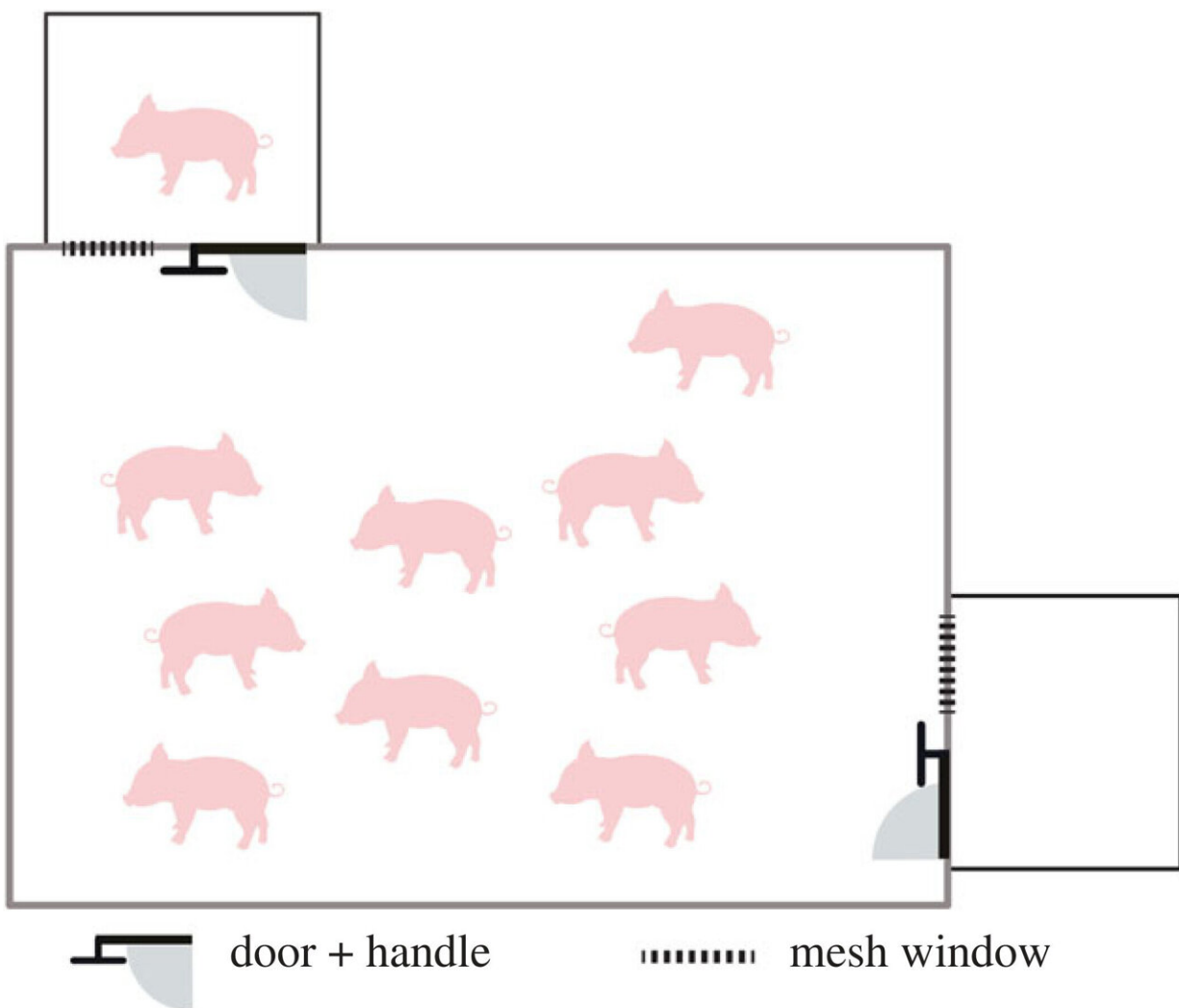


Diagram of the experimental setup, showing two identical compartments that were attached to opposite sides of the home pen. During testing, a pig was placed

in one compartment and the other remained empty. Credit: *Proceedings of the Royal Society B* (2023). DOI: 10.1098/rspb.2023.0665

Pigs are generally considered to have high intelligence, and new research shows that they may also be empathic to other members of their social groups, helping them during instances of need. But is this behavior truly unselfish, or is it driven by goal-specific motivations?

To investigate, researchers from the Research Institute for Farm Animal Biology in Germany and Austria's University of Veterinary Medicine Institute of Animal Welfare Science have studied helping behavior among social groups of domestic pigs. Their work, titled "Spontaneous helping in pigs is mediated by helper's social attention and distress signals of individuals in need," is published in *Proceedings of the Royal Society B*.

In the wild, animals will often help members of their social groups in times of distress, defending them against predators or releasing them from traps, snares, or other types of confinement. There is no general consensus over whether such helping behavior is truly empathic, or whether it might be driven by a more selfish motivation.

Previous research involving helping experiments using rats, mice, and ants has been inconclusive due to questions about whether the experiment designs (for example, making available "rewards" such as new social partners or access to new locations for demonstrations of helping behavior) and assumptions about distress levels of trapped individuals might have confounded study results.

In this new study, which involved German Landrace pigs born and kept at Germany's Experimental Pig Facility at the Research Institute for

Farm Animal Biology, the research team attempted to control for these issues by developing a new paradigm that would allow the test subjects to express a range of responses through more behavioral flexibility. The team designed a test in which a pig could open a door to release a trapped fellow pig, but included the novel aspects of pre-testing group socialization and location familiarization measures.

The initial study population included 78 newly-born pigs. After the pigs had been weaned between 46 and 55 days of age and before any testing began, two pigs were removed for treatment of illness. An additional subject died of natural causes. The researchers' results are based on the 75 subjects who completed the study.

Socialization and familiarization

The research team socialized the young pigs in four cohorts, subdivided into two social groups each. When the pigs reached the age of 28 days, the researchers remixed the groups, sex-balancing them equally and including two to four littermates from each contributing litter. Within each cohort, the social groups were housed in neighboring pens of identical size and shape. Throughout the study, pigs in neighboring pens could hear and smell each other, but could not see each other or have physical contact.

Then, keeping the pigs within their groups and home pens, the researchers familiarized them with two new, open-top, smaller compartments placed temporarily adjacent to the home pens. Each compartment included a new door-opening mechanism designed for the pigs to open from the outside with their snouts.

Before the testing began, the pigs were given multiple, time-limited opportunities to open the doors and explore these compartments. At the end of each familiarization session, a researcher would gently lead any

pigs out of the temporary compartments and close the doors. Each session ended after the pigs lost interest in the compartments, and had not touched or opened either door for 10 minutes.

Pre-testing and testing

The pre-testing followed a similar process, except that when the researchers noted that the pigs had lost interest in the compartments, they would remove a designated individual and isolate it in a separate room for five minutes while monitoring the rest of the group. Such separation typically induces stress in pigs (characterized by squealing, screaming, and escape attempts), and each pig within the study took a turn as the designated individual.

If none of the remaining group members opened any of the compartments, the researchers would return the "designated trapped pig" to one of the temporary compartments, lowering it in from above, without providing contact between the test subject and the rest of the group. If a group member opened a door before the designated individual was placed inside the compartment, a researcher would ensure the compartment was empty, close the door, and wait five more minutes before placing the test subject inside for the test trial.

During each test trial, the trapped pig could hear and smell the group members at all times, and could see them through a mesh window, which also allowed limited physical contact. The second of the two temporary compartments remained empty as a control.

Each test trial ended either when a group member released the trapped pig by opening the door to its compartment, or after 20 minutes with no help from group members. However, the research states, "It is important to note that distress signals were neither necessary nor sufficient for helping to occur." In a single instance, for ethical reasons, a researcher

released a trapped pig exhibiting signs of distress after three minutes with no help from any group member.

Results

Among the notable results, 37 pigs (49% of the potential helpers) opened doors during 48% of the pre-testing separation exercises, but only nine of these also opened the door during testing to help a trapped pig. Of 28 pigs who opened an empty compartment's door during a test trial, only nine also helped a trapped pig during testing. Across all the test trials, 64 trapped pigs (85%) received help from 33 group members (44% of the potential helpers), each of whom was the first to open the compartment door.

The research also states, "While a pig was trapped, potential helpers spent more time looking at the window of the test compartment than they spent looking at the window of the empty compartment, and the proportion of time spent looking at the test compartment window was the strongest predictor of helping. However, the majority of trapped pigs produced vocal and locomotor distress signals that should have been readily detectable without looking through the window, and the helpers' behavior is also consistent with more selfish explanations."

In discussing their results, the researchers observed that pigs who helped others visually assessed the situation before doing so; and that distress signals by trapped pigs generally made them more likely to receive help and to receive it faster. However, they also offer alternative explanations for helping behavior, and note that more studies are needed to broaden our understanding of [pigs'](#) motivation for spontaneous helping.

More information: Liza R. Moscovice et al, Spontaneous helping in pigs is mediated by helper's social attention and distress signals of individuals in need, *Proceedings of the Royal Society B: Biological*

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