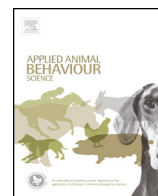




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## Persistency of the piglet's reactivity to the handler following a previous positive or negative experience



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### ABSTRACT

A central question in the stockman–animal relationship is how animals perceive humans depending on previous interactions with them. This study aimed at measuring the influence of a previous experience with humans on subsequent reactivity to humans of weaned piglets. Treatments differing in type (intrinsic vs extrinsic to the human) and valence (positive vs negative) of the reinforcements used over a 5-day standardised treatment period with a handler were delivered to 48 groups of three piglets following weaning: (1) gentle handling (GENHD), (2) food reward (FOOD), (3) gentle handling and food reward (FOODHD), (4) rough handling (ROUHD), (5) ball gun (e.g., plastic ball fired by a spring gun) without movement (GUN), (6) ball gun with movement (GUNHD), (7) passive human (PASSIVE, no reinforcement) and, (8) control (CONTROL, absence of additional experience with humans). The approach behaviour during a motionless handler phase was recorded weekly for 5 weeks after the treatment period. Thereafter, reactivity was scored (i.e., 0 = no escape to 4 = piglet escapes before handler makes any contact) during a handler approach phase. Following the treatment period, whereas piglets from all positive treatments approached the motionless handler, only those that received a gentle handling and were habituated to human contact accepted to be touched (average scores: 0.4, 0.3, 2.4 and 2.0 for FOODHD, GENHD, FOOD and PASSIVE, respectively,  $P < 0.0001$ ). Rough handling was sufficient to induce fear and adding a mild physical stressor (i.e. ball gun shot) did not exacerbate the fear response (average scores  $> 3.8$  for all negative treatments,  $P > 0.05$ ). Unfamiliarity with the handler induced a natural vigilance and fear response since CONTROL piglets spent less time in contact with the handler than piglets from positive treatments until 2 weeks after the treatment period with the handler (28% vs 84%, 87%, 86% and 72% for CONTROL vs GENHD, FOODHD, FOOD and PASSIVE, respectively,  $P < 0.05$ ) and they showed comparable reactivity scores to the handler approach with piglets from negative treatments until 5 weeks after the treatment (1.3, 2.7, 2.9 and 2.8 for CONTROL, ROUHD, GUN and GUNHD, respectively,  $P > 0.05$ ). The perception of the handler was strongly modulated by the previous experience with her as behavioural differences between positive and negative treatments persisted for at least 5 weeks. For instance, during the last reactivity test, it is particularly noteworthy

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that all piglets from positive treatments touched the handler within 22 s, whereas 20% of piglets from negative treatments did not make contact ( $P < 0.0001$ ). To conclude, piglets are able to associate humans with particular experiences and remember the past experience with humans during at least 5 weeks.

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## 1. Introduction

Human–animal relationship is intimately related to animal welfare (Waiblinger et al., 2006). The nature of human contact can significantly modulate the perception of humans and affect behavioural responses to humans in farm animals (for a review, see Boivin et al., 2003; Waiblinger et al., 2006). On modern commercial farms, human–animal interactions have been reduced (e.g., automatized feeding), but the stockman presence is still necessary and is often limited to stressful or painful husbandry practices (e.g., medical procedures, mixing, castration). Thus, it is common to observe farm animals displaying fear-related behaviour in their presence (for a review, see Zulkifli, 2013).

Reactivity tests, also called “fear tests”, have been developed in order to evaluate the effects of human behaviour and routine management procedures in farm animals (Waiblinger et al., 2006; Forkman et al., 2007). Pigs (Tanida et al., 1994), and other species such as cows (Lensink et al., 2000), sheep (Mateo et al., 1991) and foxes (Pedersen, 1994) spontaneously express fear of humans and negative handling can accentuate these fear responses. For example, using loud tones, making threatening postures and forcing piglets in the creep area during the suckling period are perceived as aversive and increase the withdrawing response of piglets to a human approach on the day of weaning compared with piglets that receive neutral treatment (Sommavilla et al., 2011). Although pushing away growing pigs whenever they touch the handler does not demotivate them to try to establish contact (Terlouw and Porcher, 2005), the use of battery-operated prodder whenever growing pigs approach or fail to avoid the handler induces an exacerbated fear response and a physiological stress response (Gonyou et al., 1986; Hemsworth et al., 1986a, 1987). However, Hemsworth et al. (1996) found that pre-pubertal gilts seem to have difficulties associating human presence with a negative reinforcement dissociated from the human such as the introduction of a boar into their pen. Therefore, the extent to which the human is involved in the delivery of the reinforcement (i.e., the human’s degree of involvement) may have an impact on the association of the human with the reinforcement or the event.

Frequent and gentle contact with domestic species may have positive effects and be recommended. For instance, early feeding and handling of veal calves, especially along the first four days after birth, increase their subsequent motivation to approach and to suck the human’s clothing (Krohn et al., 2001). Early gentle contact with humans also enhances approach behaviour to a motionless human in pigs (Hemsworth et al., 1986b). However, studies in horses reported that strokes may not necessarily be positive and

could even be perceived negatively if given too early in presence of the mare (Henry et al., 2006). Some studies suggest that feeding animals may be the key for tameness (pig: Hemsworth et al., 1996; cattle: Jago et al., 1999; horse: Sankey et al., 2010) while others argue that feeding is not sufficient for the development of an affinity with a caregiver (Tallet et al., 2009).

Different testing situations may induce various levels of emotional states and influence the animal response to humans (cows: Grignard et al., 2001; hens: Graml et al., 2008). For example, Miura et al. (1996) demonstrated that a handler approaching was more frightening than a handler withdrawing, and they suggested that a human standing straight may be more threatening for pigs than a handler stooping down. However, information is missing about the impact of the type of test (e.g., motionless handler vs approaching handler), and the familiarity with the handler in a situation of human–animal interactions during the post-weaning period in pigs. The conflicting literature about the extent to which pigs, and particularly piglets, can associate humans with an event (positive or negative), and a type of reinforcement (intrinsic (e.g., strokes) vs extrinsic (e.g., food) to humans) suggests that further research has to be carried out. Therefore, the objectives of the present study are: (1) to evaluate the impact of the degree of involvement of humans in positive or negative reinforcements on their subsequent association of humans with these reinforcements and, (2) to measure the persistency of the reactivity to humans during the post-weaning period, i.e. from 4 to 10 weeks of age.

## 2. Materials and methods

### 2.1. Animals and housing

A total of 144 piglets from 24 litters ((Yorkshire × Landrace) × Duroc) were weaned at  $21 \pm 2$  days of age and allocated in one of the 48 groups of three piglets, divided over time into four blocks of 12 groups. They were housed in experimental rooms containing four pens of 3.46 m<sup>2</sup> each. Each group was composed of individuals of both genders and from three different litters, with a difference of at least 1 kg weaning weight between the medium and both the lightest and the heaviest piglets. Physical contact with humans was limited to weighing and vaccination at birth and weaning. Teeth were not clipped or ground, tails were not docked and males were not castrated. Once groups were formed and brought together in pens, piggy staff had no permission to enter the pens or handle piglets and could only visually check their health status and fill feeders twice a day. Eight piglets were removed

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