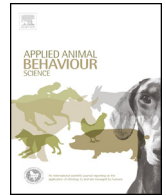




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# Positive perception of human stroking by lambs: Qualitative behaviour assessment confirms previous interpretation of quantitative data

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### ABSTRACT

Qualitative behaviour assessment (QBA) was used to validate previous published interpretation whether human stroking has beneficial effects on lambs prematurely separated from their mothers. For a period of 8 weeks a familiar human (FH) subjected 22 Romane lambs to a gentling treatment based on strokes. At the age of 8 weeks each lamb was placed in the experimental pen and tested. Half of them received the gentling treatment (STROKE) for 8 min, and the others were simply exposed to the human presence for the same period of time (PRESENCE). Animals were equipped for heart rate recording and tests were video-recorded. These behavioural and heart rate variability data have been already published. A free choice profiling approach was used to instruct ten observers in qualitative behaviour assessment (QBA). Short video sequences of the tests were randomly presented and scored by the observers unaware of any information about the quantitative data recorded. QBA data were analysed using Generalised Procrustes Analysis (GPA). The GPA consensus profile explained a high percentage of variation among the 10 observers, and differed significantly from the mean randomised profile ( $P < 0.001$ ). The two main dimensions of the consensus profile explained 42,3% and 18,0% of variation between the tested lambs. All of the interpretation word charts were semantically consistent and oriented to the same meaning despite the use of different descriptors. The most used descriptors to label the first dimension was characterised by descriptors ranging from “curious” (positive end) to “relaxed” (negative end), whereas the second dimension ranged from “indifferent” (positive end) to “sociable” (negative end). Lambs from group PRESENCE received significantly higher scores than group STROKED on the Dimension 2 ( $\chi^2 = 4.49$ ,  $P < 0.05$ ) and were therefore assessed as more indifferent. Conversely, the animals from group STROKED received significantly lower scores on Dimension 1, thus resulting more relaxed than group PRESENCE ( $\chi^2 = 4.48$ ,  $P < 0.05$ ). A principal component analysis showed meaningful relationships between quantitative and qualitative variables with variables indicating relaxation and positive emotions displaying high loadings on the negative end of axis 1, whereas variables showing a low level of arousal but less positive emotions were more related with the positive end of axis 2. In this study QBA confirms previous interpretations from quantitative behavioural and physiological data. In general, we can suggest QBA as a tool to help in the elucidation of quantitative physiological and behavioural data.

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## 1. Introduction

A great body of research has been conducted on the type of relationship that can potentially develop between animals and humans (see [Rushen et al., 2001](#) for a detailed description). Most of these studies focussed on how to prevent the occurrence of negative relationships and promote habituation to the human presence

in order to make animal handling safer and easier ([Hemsworth and Coleman, 2011](#)). For instance, lambs have been subjected to a number of experiments where stroking proved to be effective in sustaining their welfare by reducing fear of humans ([Caroprese et al., 2006](#)), particularly when artificial rearing, and the consequent early separation of lambs from their mothers, is applied ([Napolitano et al., 2006](#)). In addition, more recently numerous studies have been conducted with the aim to promote the development of positive emotions in farm animals. High quality relations with humans have been suggested as potential tools to provide good welfare ([Rault, 2012](#)). In particular, [Schmied et al., \(2008a,b,](#)

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2010) observed that stroking might be a good way to provide comfort to the cows, particularly if applied to body regions normally used for intra-specific grooming. Social grooming is considered a reliable indicator of within-species affiliative and socio-positive interactions (Rault, 2012). Therefore, the application of stroking treatments to animals of species showing intra-specific grooming may promote the development of inter-specific (i.e. human – animal) affinity.

In 2015 Coulon et al. produced data suggesting that lambs, previously subjected to gentling, positively perceive stroking performed by a familiar human. Based on their reaction in terms of heart rate, heart rate variability and ear position, these animals were considered calmer than others previously subjected to gentling but then only exposed to the presence of a motionless familiar human. However, due to the lack of intra-specific grooming in sheep (except soon after birth) there is hesitancy in accepting this interpretation and the authors reported a number of other possible explanations, including freezing reaction to fear, of the behavioural and physiological responses to stroking. Qualitative behaviour assessment (QBA) is a method based on the capacity of human observers to capture different pieces of information concerning animal posture and subtle particulars of animal behaviour and translate them into behavioural descriptors depicting the style of interaction of the animals with the environment (Wemelsfelder et al., 2001). Previous studies demonstrated the convergent validity (Napolitano et al., 2008; Stockman et al., 2011), the intra- (Wemelsfelder et al., 2001) and inter-observer reliability of the method (Wemelsfelder et al., 2009) as well as the high level of agreement between groups of observers with different backgrounds (Napolitano et al., 2012). Therefore, QBA can supplement quantitative behavioural and physiological data by adding critical information for their interpretation.

In order to integrate the behavioural and physiological information gathered quantitatively and to support the hypothesis that lambs previously exposed to regular gentling treatments positively perceive human contacts, following up the paper by Coulon et al. (2015), QBA was used to evaluate qualitatively the emotional and behavioural response of lambs when subjected to stroking or human presence.

2. Material and methods

2.1. Experimental design and video production

Twenty-four Romane lambs (after colostrum ingestion) were separated from their dams at 12 h of age for experimental purposes. They were then assigned to six groups of four animals and kept in straw bedded pens (2 × 2 m, 1 m<sup>2</sup>/head). The experimental procedures imposed to the lambs were published in Coulon et al. (2015) and are summarised in Table 1. Shortly, for a period of 8 weeks a familiar human (FH) subjected all of the lambs to a regular gentling treatment based on strokes: the FH entered the pen, crouched down, caught each lamb and petted it on the whole body surface for 30 s while talking softly. During the tactile stimulation treatment the lambs were habituated to the presence of another person (placed in front of the pens for 3 min per day during handling) who was in charge of carrying the animals in the experimental box (an individual box of around 1 m<sup>2</sup> with open fences located in the home pen) the day before the test. Even if isolated, lambs could have tactile, auditory and olfactory contacts with peers. Each day, one lamb per experimental pen was tested. At the age of 8 weeks each lamb, (2 were excluded for health problems) in random order, was placed in the experimental pen and tested. Half of them (11) received the gentling treatment (STROKE) for 8 min, and the others (11) were simply exposed to the human presence for the same period of time (8 min) (PRESENCE). The STROKE condition was

Table 1  
 Timetable of the main experimental procedures imposed to the lambs.

Time	12 h	Day 1	Day 2	Week 1	Weeks 2-5	Weeks 6-8	End of week 8
Procedure	Separation from mothers	Three 30 s sessions: bucket feeding training	Three 30 s sessions: bucket feeding training	30 s petting and talking per lamb, 3 times a day, 6 days in a week	30 s petting and talking per lamb, 3 times a day, 5 days per week	30 s petting and talking per lamb, once a day, 5 days per week	Testing Stroking: 11 lambs Presence: 11 lambs
Person involved	Stock-person	Stock-person	Stock-person	Familiar human	Familiar human	Familiar human	Familiar human + handler
				3 min habituation to the handler located outside the pen once a day Handler	3 min habituation to the handler located outside the pen once a day Handler	3 min habituation to the handler located outside the pen once a day Handler	

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