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Acoustic properties of piglet voices determine what emotional intensity and valence people attribute to them

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Vocally expressed emotions can be sometimes recognised by another species. This understanding may rely on specific acoustic parameters of the calls. We investigated how humans perceive emotions in piglet voices and how they assess the type of situation from the calls dependent on the vocalisations' acoustic parameters. 48 examples of calls, each by a different 7-14 days old piglet (12 examples recorded in each of 4 situations, namely castration, isolation, reunion with mother and nursing) were played back to 61 university students who had very limited previous experience with live pigs or pig vocalisations. Each respondent judged 12 examples (3 per situation, without knowing about the situations) for emotional intensity, 12 examples for valence and decided for another 12 examples in which situation they had been recorded. The examples were analysed for their acoustic properties, including call rate, proportion time spent calling, pitch, harmonic-to-noise-ratio and jitter. In a mixed linear model that included random effects of person identity and call identity, the acoustic properties explained >50% of judged intensity and valence. Estimated emotion intensity increased with the pitch of the call and with the proportion of time spent vocalising. Valence was judged more positive with decreasing pitch, decreasing time spent vocalising and increasing vocalisation rate ($P < 0.001$). People identified situations correctly in 51%, significantly ($P < 0.0001$) above chance level of 25%. Interestingly, correct assignment was highly correlated with judged intensity. For castration and reunion calls, the higher intensity the respondents assigned to an example, the more likely the situation was correctly identified ($r = 0.77$, $P < 0.01$ and 0.69 , $P < 0.05$, respectively). For nursing calls, calls perceived as less intense were more often correctly assigned ($r = -0.821$, $P < 0.01$). In conclusion, people judge emotions from pig calls using simple acoustic properties and perceived intensity may guide judgements about the situation.