Humans can identify cats’ affective states from subtle facial expressions

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Abstract

Although cats’ popularity as pets rivals that of dogs, cats are little studied, and people’s abilities to read this apparently ‘inscrutable’ species have attracted negligible research. To determine whether people can identify feline emotions from cats’ faces, participants (n = 6,329) each viewed 20 video clips of cats in carefully operationalised positively (n = 10) or negatively valenced states (n = 10) (cross-factored with low and high activity levels). Obvious cues (eg open mouths or fully retracted ears) were eliminated. Participants’ average scores were low (11.85/20 correct), but overall above chance; furthermore, 13% of participants were individually significantly successful at identifying the valence of cats’ states (scoring ≥ 15/20 correct). Women were more successful at this task than men, and younger participants more successful than older, as were participants with professional feline (eg veterinary) experience. In contrast, personal contact with cats (eg pet-owning) had little effect. Cats in positive states were most likely to be correctly identified, particularly if active rather than inactive. People can thus infer cats’ affective states from subtle aspects of their facial expressions (although most find this challenging); and some individuals are very good at doing so.

Understanding where such abilities come from, and precisely how cats’ expressions change with affective state, could potentially help pet owners, animal care staff and veterinarians optimise feline care and welfare.

Keywords: affective states, animal care, animal welfare, cats, emotional states, facial expressions

Introduction

Cats are popular pets, and even more common than dogs in many countries (European Pet Food Industry Organisation 2016; American Pet Products Association 2018). Despite this, people’s bonds with cats are sometimes rated weaker than their bonds with dogs (Martens et al 2016; Arahori et al 2017). Furthermore, compared to dogs, cat behaviour, welfare and cognition has attracted far less research (Walker et al 2014; Sheve & Udell 2015; Udell & Shreve 2017). For instance, at least 16 studies have investigated humans’ abilities to identify dogs’ affective or motivational states (see Table S1: https://www.ufaw.org.uk/the-ufaw-journal/supplementary-material). Their findings include that videos of dogs in positive states are typically identified correctly, while those of dogs in fearful or anxious states are not (unless raters have professional canine expertise) (Wan et al 2012; Demirbas et al 2016); that people perform better than chance when asked to match recorded growls with context (eg food-guarding versus play) or states like ‘aggressiveness’ (Taylor et al 2009; Faragó et al 2017); and that images of the faces of dogs in affectively diverse contexts are generally correctly identified as indicating positive, negative or neutral states (Schirmer et al 2013; Kujala et al 2017). However, beyond the dramatic, widely recognised signals of cats under threat (the fully retracted ears, hissing open mouths and piloerection so well-described by Darwin [1998] and Leyhausen [1979]), how well humans can read cats, in contrast, has been little researched, attracting just four peer-reviewed studies to date. Three investigated vocalisations, showing that people have limited abilities to correctly match recorded ‘meows’ to the contexts or states of unfamiliar cats (though some raters are successful, especially for familiar cats) (Nicastro & Owren 2003; Belin et al 2008; Ellis et al 2015; Table S1 [https://www.ufaw.org.uk/the-ufaw-journal/supplementary-material]). The fourth focused on facial expressions (Holden et al 2014): Veterinarians and veterinary nurses asked to distinguish between still images of the faces of painful and pain-free cats were often incorrect. However, significantly high success rates were observed for some images and, also, again, for some individual raters. Furthermore, careful quantitative measurements of specific anatomical landmarks revealed that pain did indeed induce consistent, if small, changes in cats’ muzzle shapes and ear positions (Holden et al 2014).

Evidence thus indicates that at least some humans can detect subtle changes in painful cats’ faces, but whether such abilities translate across a wider spectrum of emotions has