

Negative attitudes towards predators do not necessarily result in their killing

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In a recent article Soto-Shoender & Main (2013) assessed local perceptions of jaguars *Panthera onca* and pumas *Puma concolor* in the tropical lowlands of Guatemala. Independently of their results the authors made the questionable assumption that negative perceptions of, or attitudes towards, predators will result in their persecution (the words perceptions and attitudes were used interchangeably in the article). This assumption was made explicitly in the first sentence: 'negative perceptions towards predators, and hence their persecution. . .'. This assumption was also implicit elsewhere in the article. For example, in the last paragraph the authors stated that their results (about perceptions) suggest that 'killing of carnivores may vary locally and regionally'. Many conservation biologists erroneously believe that attitudes are equivalent to behaviour (Heberlein, 2012). However, there is general agreement among social psychologists that attitudes and behaviour are distinct and, typically, are not highly correlated (Glasman & Albarracín, 2006). This lack of correlation between attitudes and behaviour has been frequently recorded, including in studies addressing people's attitudes towards predators and their persecution. For example, in south-west China farmers and livestock producers exhibited attitudes towards Asian black bears *Ursus thibetanus* that were more negative than those of professional poachers but the latter killed more bears than the former because their economic motivation was greater (Liu et al., 2011). In general, factors beyond the individual and setting (the economic motivation, for example) have more influence on what people do than beliefs, knowledge or emotions (Heberlein, 2012), which are the drivers of attitudes. There are several factors that can affect relationships between attitude and behaviour (reviewed in Manfredi & Bright, 2008). Firstly, we are often ambivalent in the attitudes we hold and these ambivalent attitudes usually predict behaviour. For example, an ambivalent individual from the tropical lowlands of Guatemala may believe that jaguars and pumas are (1) an important part of the natural ecosystem and (2) attractive and interesting animals; this person may also believe it is likely that carnivores (3) kill livestock and (4) constitute a potential threat to humans. In this case these four beliefs describe an ambivalent attitude towards jaguars and pumas, suggesting a low willingness to kill them. However, Soto-Shoender & Main (2013) would have assigned to this person a negative perception of these carnivores and assumed that the person would be willing to kill them. Secondly, it is widely accepted that attitudes will not predict behaviour unless they are measured with corresponding levels of specificity. In other words, general attitudes will not predict specific behaviours. In this sense believing that jaguars and pumas are not important for the forest and wildlife (a general attitude) will not necessarily correlate with a high willingness to persecute them (a specific behaviour). Thirdly, the intensity of a behavioural response is notably influenced by strength of attitude. Thus, strong attitudes are generally more stable and are more likely to have an effect on people's behaviour. Unfortunately, assessing attitude strength is not possible with yes/no questions, as used by Soto-Shoender & Main (2013). These are only some examples of factors that could influence the relationship between attitude and behaviour. It is important to note that a negative attitude towards predators (jaguars and pumas in this case) will not necessarily result in their persecution.

In conclusion, I agree with Soto-Shoender & Main (2013) that we need to know more about attitudes but I believe that we need to go beyond the simple notion that attitudes and behaviours are the same. In agreement with social psychologists (e.g. Glasman & Albarracin, 2006) I consider it essential to examine when attitudes predict behaviour instead of whether attitudes predict behaviour. From this perspective understanding when negative attitudes towards jaguars and pumas result in their persecution would help the conservation of these important felids in the tropical lowlands of Guatemala.