

# From fear to understanding: changes in media representations of leopard incidences after media awareness workshops in Mumbai, India

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## Abstract

The nature of media reporting can have a serious impact on the policy and management of wildlife and other conservation issues, perhaps especially in areas where large charismatic wildlife still persist amongst a high-density human population. This study used qualitative content analysis to evaluate whether a series of media workshops had an impact on the reporting of human–leopard interactions in Mumbai, India, with the goal of de-sensationalizing coverage of negative interactions, as well as providing more factual information to the public. The qualitative analysis used newspaper article headlines to make the analysis relatively simple and affordable. The results found that despite fewer attacks in our post-workshop time-frame, reporting about leopards actually increased. However, the coverage was less sensational, leopards were not portrayed as being the aggressor as often, more emphasis was placed on how humans can prevent attacks, negative impacts on leopards were considered more often, and more realistic solutions were presented. Our results show that proactive engagement with the media, even over contentious issues, can lead to changes in how conservation issues are covered—eventually aiding in the conservation of the species and, in this case, even the welfare of the people through reduced conflict. In addition, this study found that qualitative content analysis can be a relatively simple and straightforward tool that can be implemented for such analysis.

**Key words:** Leopard (*Panthera pardus*), Mumbai, India, human–wildlife conflict, media analysis, qualitative content analysis

## Introduction

The recovery and persistence of large carnivores is affected not only by ecological drivers but also by social and political dimensions that shape policy and management (Chapron et al. 2014; Dickman 2010; Redpath et al. 2013; Treves and Karanth 2003).

Deeply rooted perceptions of carnivore threats to human safety and livelihoods are important in how far local people are willing to accept their presence (Jacobson et al. 2012) and large cats are no exception. These perceptions are further amplified by the effects of mass media, especially newspapers (Gore and Knuth 2009). The negative perceptions of interactions between wildlife and people

could result in the public being less willing to seek education on coexistence or conservation and could lead to unresolved conflict (Inskip and Zimmerman 2009). In this regard, the media, with its ability to change public perceptions as well as to reflect public concerns (Burgess 1990; Wolch, Gullo and Lassiter 1997), becomes an important conduit for changing how people respond to human-wildlife interactions (McCombs and Shaw 1972).

The mass media can both limit the information with which the public understands an issue and remove alternative solutions to problems from public debate (Happer and Philo 2013). Further, the frequency and content of environmental information (Stamm, Clark and Eblacas 2000) and the quantity of coverage on an issue (Weaver, McCombs and Shaw 2004) can serve to set the public's agenda on a specific issue (McCombs and Shaw 1972). However, a potential mismatch does occur between media coverage of human-wildlife interactions and the actual risk such interactions hold to the public (Alexander and Quinn 2011; Muter et al. 2012), with media often focusing on actual and potential human-wildlife conflict and other negative interactions when discussing wildlife issues (Corbett 1995).

With the media's ability to provide information to a wide audience, the media has the potential to affect how human-wildlife interactions are defined (Corbett 1995; Gore and Knuth 2009). Further, policy narratives (stories with a preference or support for a specific policy or view) can serve to strengthen pre-existing opinions or to sway readers to change their mind (Shanahan, McBeth and Hathaway 2011). For example, news coverage of sharks in both Australia and the USA emphasizes the risk that sharks pose to humans, not the risks humans pose to sharks, and this could steer the public towards seeing sharks as perpetrators, not victims (Muter et al. 2012). Philpott (2002) further described changing media coverage of shark-human interactions in the USA in the early 1900s. Before a series of shark bites in 1916 in the state of New Jersey, shark bites were not considered a great concern by most members of the public. Philpott argues that these incidents coincided with a fundamental change in American journalism, prompting many journalists to seek out dramatic, 'shocking' stories. As coverage became more sensationalistic, public concern over the risks of human-shark interactions grew, and this concern might play an indirect role in decreasing support for shark conservation. In another example, media coverage of cormorants in the Great Lakes region of the USA shifted from framing cormorants as victims of human actions to perpetrators of crimes against humans over a few decades, reflecting changing concerns over these birds (Muter et al. 2009).

Many factors influence the public's fear of large carnivores near where they live, and one of the best conservation strategies to prevent and/or reverse that perception is to develop educational programs and engage in more outreach as conservation professionals (Roskaft et al. 2003). As media plays a role in informing and influencing public opinion (Burgess 1990; Wolch, Gullo and Lassiter 1997), outreach should target not only the public but also members of the media. Media headlines that do not promote fear and retaliation, and rather mention positive efforts and conflict prevention strategies may serve to inoculate the public to negative news about leopard attacks in the future (Burgoon, Pfau and Birk 1995; Pashupati, Arpan and Nikolaev 2002; Szybillo and Heslin 1973). Media awareness workshops are sometimes conducted by conservation groups, but their effectiveness in changing how the media reports is rarely evaluated or reported. Content analysis can help conservationists gauge how media shapes public perceptions and attitudes towards potentially dangerous animals such as sharks

(Boissonneault et al. 2005; Muter et al. 2012), wolves (Houston, Bruskotter and Fan 2010), Florida panthers (Jacobson et al. 2012), leopards (Bhatia et al. 2013) and black bears (Siemer, Decker and Shanahan 2007).

In this paper, we assess the impact of media workshops conducted by Sanjay Gandhi National Park (SGNP) management on print media and the nature of human-leopard interactions in Mumbai, India. We utilized qualitative content analysis (QCA) (Morgan 1993) to analyze the framing of print media reports on human-leopard interactions in Mumbai. The QCA identified changes in print media from before to after the workshops, demonstrating their potential to influence the way the local media reported human-leopard interactions.

## Study area

Our work focused on the urban SGNP, which is located in one of the highest human densities in the world, in the metropolis of Mumbai. The park covers around 103 square kilometers (sq km) supporting the forests of the Malabar coasts of the Western Ghats. There is evidence of ancient human presence in the park, with Buddhist archeological remains dating back to at least 2400 years ago. The forests of SGNP and the surrounding landscapes have been home to indigenous people such as the Warlis and the Mahadeo Kolis who are still present in small hamlets inside the Park.

With the city of Mumbai and its high density of humans creeping towards and slowly engulfing the park, SGNP is facing immense conservation challenges. Mumbai is the most populous city in India, home to ~18.4 million people with a minimum density of 21 000 people per sq km (Census of India 2011). Unlike most National Parks in India, SGNP has extensive year-round human presence, with resident indigenous people, over two million visitors each year, and another one million people inhabiting the outskirts of the Park.

SGNP hosts a range of unique flora and fauna, including the leopard (*Panthera pardus*), which has been involved in serious conflicts. Between 2003 and 2005, there were reports of about 31 leopard attacks on people (Maharashtra Forest Department records). These attacks resulted in tremendous pressure from the media, politicians and the public on the Forest Department to take action against leopards that were 'straying' outside the Park. The only management method used was the capture of leopards if seen outside the Park, and their subsequent release back into the Park. In addition, compensation was paid if humans were attacked. Although research demonstrated that this practice could in fact create additional conflict (Athreya et al. 2011), the pressure on the Forest Department to trap was very intense and often fueled by the way local media reported on 'straying' leopards.

## Methods

In August 2011, the Park Administration initiated a human-leopard conflict resolution project with the aim of obtaining basic ecological and sociological information on the nature of the conflict, and then providing that information to various stakeholders with a special emphasis on involving the print media. Prior to 2011 there were no systematic, official interactions between SGNP authority officials and the print media. However, starting in 2011, the Park's management proactively engaged with the media and organized a series of workshops, held at SGNP, the Mumbai Press Club, and the Mumbai Patrakar Sangh, a Marathi press club in Mumbai. These workshops

consisted of talks given by ecological and social scientists detailing the results of the studies that were carried out. The main points shared with the media were: wild animals do not follow man-made geographies and will visit areas outside the Park; despite wild prey being present in the Park, there was a great abundance of domestic prey such as feral dogs outside the Park, often located near garbage; leopards are generally scared of people, active at night, and tend to and run away from people; and the pressure to capture leopards was probably counter-productive, as translocating captured leopards could actually increase human attacks (Athreya et al. 2011). Finally, the findings of a sociological survey that indicated that different groups of people reacted differently to leopards (Athreya et al. unpublished) was shared with the media; for example, the indigenous residents of SGNP tended to be aware of leopard behavior and were accepting of their presence, but their voices were rarely heard in this debate.

Overall project results of the survey were published on the SGNP website ([sgnp.maharashtra.gov.in/](http://sgnp.maharashtra.gov.in/)). Awareness materials such as posters and brochures on how to deal with leopards in urban landscapes were also shared with local journalists. Furthermore, if journalists had any queries, the park manager and members of the research teams were always accessible to the journalists via phone or email (this interaction continues today). The resource materials were made available on the SGNP website, and a Facebook page was also started under the same name which received many journalists as followers.

For the content analysis, digitally archived articles were selected from two top English newspaper dailies, the *Times of India* (Mumbai Edition 2005 circulation over 500 000) and *MidDay* (Mumbai Edition 2005 circulation over 100 000) (*Times of India* 2017). Articles from these papers were selected for the two time periods of interest: 2004–5, before the media workshops and when a large number of leopard attacks on people were reported, and 2012–3, when few attacks on people were reported but after the media awareness program had started. The selection criteria for the newspapers were based on (i) the popularity of the paper, and (ii) the availability and accessibility of the articles for the two time periods. Initially, all local top-circulating English newspapers (*Times of India*, *Hindustan Times*, *MidDay*, *Mumbai Mirror* and *DNA*) were examined. However, only the digital archives of the *Times of India* and *MidDay* for the time periods were complete; therefore, these publications were selected. English speaking papers were chosen for readability by the researchers. Articles were found by searching for two keywords: leopard and Mumbai. Only primary articles were selected for analysis; secondary articles (such as letters to the editor and reprints) were not included.

For the analysis, we used QCA, which analyzes textual data using categories derived from interpreting the data. QCA provides a method that can measure social factors in wildlife conservation, providing increased insight where statistically quantitative methods cannot (Forman and Damschroder 2008; Schreier 2012). This method is useful for gaining access to a large amount of data currently not being utilized, to measure the success of conservation and ecological programs. Our goal was to create and test an inexpensive method (due to potentially short training times for coders and no need for specialized equipment), which, if successful, could be added to the toolbox of conservation organizations and agencies as a means of gauging the success of media-targeted workshops—and potentially the public's view of important conservation issues. Our analysis followed the guidelines of QCA discussed in Schreier (2012).

In order to further test how efficient we could make this method, we used only the headlines of media articles from the two timeframes in order to test whether our methods could be used for rapid and low-cost analysis in similar studies (Table 1). The two coders interpreting the data derived the coding subject categories during initial reviews of the headlines and the subject. During the initial reviews, no specific headlines were discussed to avoid inter-coder bias. The categories were then broken down into more and more specific subjects, and categorized while coding the data (Morgan 1993). Each descriptive frame is a qualitative category whose frequency we wanted to observe in the headlines. These descriptive frames were broken down into smaller categories called classes and sometimes further into sub-classes. The smallest descriptive unit was assigned a code, and the codes for all the categories were used to classify each data point (a headline). Coding is the assignment of codes to each headline across all descriptive frames by two people in isolation from each other's input. The isolation removes the possibility of confounding interpretations, allowing for the coding to be validated by comparing the two samples.

Our initial frame content contained eight descriptive frames, 40 broad classes and 42 sub-classes. We used standard content analysis methods (Krippendorff 2004; Schreier 2012) during three pilot rounds of coding, after which we adjusted the descriptive frames, broad classes and sub-classes. The first two pilot coding rounds used 10 random units (headlines) from each time period, and 20 random units from each time period were used in the final pilot. After the pilot coding and modifications to descriptive frame titles, we finalized the eight descriptive frames to compare the headlines: Types of Interactions, Prescribed Solutions, Blame, Voices, Impacts, Causes, Portrayal of Leopard, and Belonging/Not Belonging. Overall, the final eight descriptive frames contained a total of 38 broad classes and 36 sub-classes (Table 1).

Each of the descriptive frames had a nondescriptive class ('None' or 'Not Applicable' (NA), depending on the frame) for when coders felt the theme was not addressed or headlines were not descriptive enough to discern a theme. Further, we included a 'Neutral' code in the frames focused on bias (Blame and Portrayal of Leopard) in the case that headlines were descriptive (not 'None' or 'NA'), but still remained un-biased. Coders also could select multiple categories and sub-categories within each frame, to allow for more nuanced responses.

We used standardized methods to calculate inter-coder reliability (ICR) using the coefficient of agreement (COA) (Schreier 2012). To determine whether ICR indicated an adequate level of reliability, we used 70% agreement as our metric, based on Schreier (2012) and the fact that we had a large coding frame that allowed for multiple values per unit. We then used the average count between coders of each class and sub-class to compare the two time periods. Both the ICR and count information were used as the basis for comparison between the two time periods.

While the ICR and code counts provided specific and direct insight into patterns surrounding the descriptive frames, QCA also allows for coder insight on qualitative patterns that do not express themselves via metrics. To obtain these, coders compared notes after the final coding sessions about patterns that they noticed within the coding frame (for example, if headlines with a certain code were found to be more descriptive, or if two codes were often applied to similar headlines). The other coder confirmed and rechecked the data to verify if they agreed with the assessment of the data; if there was disagreement between

**Table 1:** Coding categories, classes and subclasses and the associated coefficient of agreement between the coders for each class

Descriptive frame	Broad class	Subclasses	Coefficient of agreement 2004–5	Coefficient of agreement 2012–3			
Types of interactions	Leopard attack	Minor	70.2	91.5			
		Adult					
		Domestic animals					
	Poaching		66.6	100			
		Leopard sighting	Negative	73.6	80.7		
	Injury/harm to leopard	Hit and run	78.5	88.4			
		Leopard attacked					
	Handling of leopard	Trapping or relocating	69.7	85.2			
		Leopard rescue	100	100			
	Research/science		100	100			
None		79.7	80.5				
Prescribed solutions	Leopard directed	Trapping	76.3	91.5			
		Translocation					
		Placing shockers					
		Micro chip					
		Killing leopards					
		Releasing prey into NP					
		Research					
		Barrier			100	100	
		Human directed			Electric fencing	72.7	85.5
					Wall building		
	Want public infrastructure						
	Awareness and education						
	Taking precautions						
	End/remove encroachment						
	Patrolling						
	Involving locals						
	Youth for conservation						
	Keeping surroundings clean						
	Blame	None	78.6	80.1			
Government		78.3	90.1				
Locals/tribal		64.3	75				
Leopard		70	86.5				
Neutral		33.3	75				
Voices	None		50	100			
		Locals	80	95			
		Victims/survivors					
	Government officials	General	70	90.5			
		Victims family					
		Government officials					
		Non-government wildlife experts					
		Animal activists					
		None					
		None			66.6	84.2	
Impacts	Physical impacts on humans	Injury	70.7	87.7			
		Death					
	Non-physical impacts on humans	Falling property prices	50	75			
		Children dropping out of school					
		Life insurance against panthers					
		Fear					
	Impacts on leopard	Trapping	77.8	89.5			
		Death					
		Harassment/injury					
	Neutral	Trap/relocate	66.6	75			
None							
None		70.3			71.6		
Human driven		Not heeding warnings			69.2	87.7	
		Lack of manpower					
	Lack of infrastructure						
	Government						
	Solutions						
	Encroachments						
Leopard driven		73.4	79.9				
	Coexistence is not possible	50	100				
	None	74.3	82.6				

(continued)

Table 1: (continued)

Descriptive frame	Broad class	Subclasses	Coefficient of agreement 2004–5	Coefficient of agreement 2012–3
Portrayal of leopard	Victim		70	83.6
	Aggressor 'attack' 'kills' 'devours'		66.6	83.7
	Wild/natural 'prey' 'stalk' 'hunt'		50	73.5
	Neutral		100	80.3
	None		80	80
Belonging/not belonging	Belonging		62.3	68.7
	Not belonging		68.5	72.4
	Neither		74.3	82.4

the two coders, the pattern or lack of pattern was not considered observed. Patterns or lack of patterns were discarded only after three rounds of comparing codes and refining the conditions, as well as checking with a third party to determine if the observations or interpretations were too different to connect. For example, articles mentioning child attacks may have seemed more sensationalized or less focused on the facts to one coder. If the other coder disagreed or did not observe this pattern, then no trend in level of detail related to articles mentioning attacks on children was included in the analysis.

## Results

Our target timeframes were between 2004 and 2005 (before the media workshops) and between 2012 and 2013 (during and after the media workshops). The keyword search of 'Leopard and Mumbai' yielded a total of 285 newspaper articles. One hundred and thirty-four articles were found between 2004 and 2005, and 151 articles were found between 2012 and 2013. Between 2004 and 2005, *Times of India* published 92 articles and *MidDay* published 42. Between 2012 and 2013, *Times of India* published 87 articles and *MidDay* published 64.

To check the validity of our results we measured consistency between the two coders when applying the coding frame to the sample data. We calculated the COA for each broad class in each time period (Table 1) and overall for each time period (71.1% for 2004–5 and 84.8% for 2012–3). The COA for each time period fell above our set goal of 70%. We noticed the COA in every broad class except one either stayed the same or increased in the second time period, demonstrating that the coders continued to share a high degree of agreement throughout the analysis.

We found an overall decrease in the number of times leopards were viewed as an aggressor (94–71) from the 2004–5 to 2012–3 periods, and an increase in how often they were viewed as victims (13–19) or behaving naturally (6–14). The number of headlines that mentioned poaching increased (1–10), highlighting potential human causes of conflict. Also, we observed a decrease in how often the leopards were viewed as the cause of the incident (16–5), and an increase in human actions causing the incident (13–32). No headlines in 2012–3 mentioned using barriers or walls to reduce conflict (five did in 2004–5), and the number of times solutions was centered on changing people's behaviors (human driven) went from 16 to 29. We found headlines in 2012–3 were also more likely to cover the impacts on leopards (from 28 to 40).

While the number of leopard attacks between the two periods decreased from a total of about 30 in the first time period to a total of eight in the second time period (Maharashtra Forest

Department records), the mentioning of leopard attacks in the headlines increased from 36 in 2004–5 to 41 in 2012–3. Since QCA allows for nonquantitative inferences to be drawn from the sample data, both coders noticed an increase in detail or descriptiveness in headlines written in 2012–3. We also ran a one-tailed, paired samples t-test to verify the observed directional difference existed ( $P = 0.0012$ ) between all coefficients of agreement for the two time periods in question, to see if agreement went up for the headlines of articles from the second time period. The reason for this analysis was to metrically test the observation that headlines from articles from the second time period (after the workshops started) were more detailed and easier to understand. Coders also noted that the language describing leopard attacks was less sensationalized. For example, headlines for articles written in 2004–5 used words like 'mauled', 'devoured' and 'mutilated', often with very little description of the setting, whereas the 2012–3 article headlines used more neutral words like 'attacked' or 'killed', and then described in detail what the person was doing and where the attack occurred. The data used for these analyses is available upon request and review of the request by the authors.

## Discussion

The goal of the media workshops, arranged by the SGNP management in collaboration with citizen groups and press clubs, was to educate the media about the complex nature of human leopard interactions in Mumbai and bring awareness to other dimensions of the issues relating to leopards in the area. The information provided to the media was also based on recent scientific studies, both ecological and sociological in nature. This was the first time such an attempt was made, despite Mumbai facing high numbers of attacks on people by leopards in the past. Many of the media personnel during our interactions with them said that they appreciated gaining more knowledge, and the openness of the Park management to engage in constructive dialogue with the media was crucial when encouraging more nuanced reporting. Dialogue with stakeholders is an important way to resolve human–wildlife conflicts (Redpath et al. 2013), and the media is an important stakeholder (Corbett 1995). We found a significant difference in content and descriptive language in the headlines written after the media workshops were conducted. Headlines were less sensationalized, blamed leopards less, and provided more detail about the setting and context of leopard attacks. We feel that this indicates the overall success of these workshops in educating members of the print media of the publications we have studied.

This analysis suggests that it is possible to shift the narrative of media reporting from one describing aggressive leopards

seeking out people, to one of a species that does not follow man-made boundaries. After the workshops, the headlines increasingly portrayed the leopards either as behaving naturally or as victims of human aggression or circumstance. An earlier paper on media content analysis from Mumbai found that reporting of leopard incidents was at its highest during the period of intensive conflict (Bhatia et al. 2013). Our results indicate an even larger increase in reporting after this, when fewer attacks occurred, but following the start of the media workshops. Moreover, the tone became more nuanced and was no longer as negative. It is well known that wildlife, especially large charismatic predators, evoke both fear and fascination in people, but it is possible to change the narrative from one that is largely fear-based to one that is more nuanced and informative. For example, Runhaar, Runhaar and Vink (2015) found that more nuanced and decreased negative coverage of badgers (*Meles meles*) created a positive public perception of the animals in Netherlands. Furthermore, after the workshops started we personally saw some journalists reaching out to conservation professionals and deliberately tempering their coverage of human-leopard interactions, while also taking a proactive role in decreasing sensational reporting by their colleagues.

Although qualitative and quantitative analyses both have their strengths and weaknesses, much social research about wildlife focuses on quantitative methods. Qualitative methods such as QCA, however, can provide a framework for researchers to gain a more nuanced understanding of data that might be missed by using only a quantitative approach (Rust et al. 2017), as many researchers have demonstrated (e.g. Buller 2008; Capek 2005; Draheim et al. 2015; Ghosal and Kjosavik 2015; Jerolmack 2008; Scarce 2005). Our work also focused on the use of QCA as a tool to verify the effects of media outreach and communication efforts on coverage of human-leopard conflict. We used headlines and not complete articles to see if meaningful analysis could be done in less time, which would lead to lower costs and easier implementation. We found that the headlines provided increased information and used less negative rhetoric after the workshops were conducted. These headlines became conservation tools, as they keep readers informed of human-leopard interactions but did not provoke unnecessary fear. What in a quantitative analysis might have seemed negative (the increase in coverage of attacks) became a positive when put through a qualitative analysis.

We choose to use headlines as our unit of analysis in order to see if they could provide enough information to evaluate media workshops in a cost-effective and timely manner, as conservation programs are so often short of time and funds. Future research should expand this to see if further information can be gained by using entire articles as the unit of analysis. For example, analysis of these articles could show if a more detailed article headline was attached to a more detailed article and how well headlines accurately represented the article content in general. Those results could further validate future efforts in applying QCA solely to headlines as a means of saving time, money and effort for conservation groups and other researchers.

Conservation issues are often complex, especially those related to human wildlife conflicts. These conflicts often have their roots in human-human conflicts over wildlife (Draheim 2012; Draheim et al. 2015; Madden and McQuinn 2014), making proactive dialogue and engagement important (Redpath et al. 2013). Journalists, especially given our current round-the-clock news climate, are under tremendous pressure to provide interesting, attention-grabbing stories. Human-wildlife conflict can

provide this material, but sensationalistic and ill-informed reporting can harm conservation efforts (Evans and Adams 2016). Species that are caught in the crossfire of human-human conflicts are often charismatic, and can make for good news even in the absence of conflict. As media outlets both shape and reflect current attitudes and perspectives (Burgess 1990; Wolch, Gullo and Lassiter 1997), outreach to reporters and other members of the media can be an important conservation activity. Future research should further explore the complex relationship between reporters and media stories about leopards and the people who are living with these animals.

Most studies on media analysis of human wildlife interactions deal with assessing the framing of the content. In this work, we provide the results based on content analysis of the headlines of articles related to leopard human conflict. These results suggest that proactive engagement with the media by Park authorities and scientists has changed the framing of leopard conflict articles from sensational to more nuanced and informative. We recommend that basic science and knowledge (including traditional knowledge systems) needs to be obtained, and then in a collaborative, inclusive and transparent fashion, that knowledge needs to be communicated to the important stakeholders including the media—especially in a manner that decreases fear and increases understanding of the issue.

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