



Utilizing Demographic, Ethnic, and Human Emotional Variables to Enhance Compassion Feeling: Basis for Slow Lorises Conservation Extension Media Development

Christine Wulandari¹, Ida Nurhaida^{2*}, Sugeng Prayitno Harianto¹, Andi Windah², Samsul Bakri^{1,3}

¹Departement of Forestry, Faculty of Agriculture, Lampung University, Jalan Sumanteri Brojonegoro 1, Bandar Lampung, Indonesia 35145

²Department of Development Communication Science, Faculty of Social and Political Sciences, Lampung University, Jalan Sumanteri Brojonegoro 1, Bandar Lampung, Indonesia 35145

³Graduate School of Environmental Science, Lampung University, Jalan Sumanteri Brojonegoro 1, Bandar Lampung, Indonesia 35145

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Abstract

Slow lorises, listed as endanger under CITES Appendix I, are increasingly found outside forest habitate, including the buffer zone of Wan Abdul Rachman Grand Forest Park (Tahura WAR) in Lampung Province. While this coexistence support ex-situ conservation, it also raises risks of illegal hunting and trafficking. This study investigates how demographics, education, ethnicity, and emotion influence compassion (COMP) toward slow lorises. A log-linear model was applied at a 95% confidence level. The response variable [COMP] was scored as 1 if respondents expressed compassion, and 0 otherwise. Explanatory variables included esmotions (affection, neutral, disgust), prior direct sightings, education level, and ethnic background. Data were collected through door-to-door survey of 150 respondents across three villages in the Tahura WAR buffer zone during October–November 2023. Each respondent was shown a 20 cm × 30 cm photograph of slow loris before answering. Results suggest that compassion increases significantly among women, those with fisthand sightings, high school gradutes, and respondents with Lampung or Sundanese parental backgrounds. Affection strongly boost COMP, while disgust reduces it. These findings highlight the importance of fostering empathy through conservation education programs that complement law enforcement. These results also support the SDG 15 and 16 pillars implementation.

Keywords: disgusting-lovely, empathy-sympathy, Javanese, Lampungese, Sundanese

*Correspondence author, email: ida.nurhaida@fisip.unila.c.id

Introduction

Nowadays, wildlife conservation efforts rely mostly on law enforcement (Critchlow et al., 2017), particularly in developing countries (Lesmana et al., 2024). Due to limited resources, including the number of facilities and capacity of apparatus, as well as financing (Holden et al., 2019), this method is generally ineffective in suppressing illegal hunting and wildlife trafficking (Lamichhane et al., 2020). Moreover, psychologically law enforcement relies on an imposition from an external system, making it difficult to develop genuine self-awareness from within oneself (Jacobs & Barnard, 2022). In contrast to law enforcement, which relies on the threat of punishment, empowering local communities through education, counseling, extension (Bakri et al., 2024), and other assistance in developing emotional intelligence has much evidence to be more effective in raising awareness of moral responsibility regarding preserving EDS for future generations (Dushkova et al., 2024) and this is inline with the SDG 16 pilar. Both illegal activities are serious threats to the preservation of wild animals such as slow lorises (*Nycticebus bancanus* Marcus Ward Lyon, JR in 1906) in Indonesia. This endangered species (EDS) has been included

in Appendix I. As connoted by Sari et al. (2020), slow lorises are now more adaptive to living in agro-complex areas side by side and coexisting with human beings. The phenomenon of slow lorises coexisting with humans in this buffer zone stems from widespread forest degradation, which stimulates slow lorises to frequently leave the forest to forage. As a result, slow lorises are often captured and kept outside the area by villagers in the buffer zone (Nekaris et al., 2017). On one hand, it can be considered as an ex-situ conservation strategy (Engels et al., 2021), especially if accompanied by an education program for the villagers about caring for and nurturing slow lorises, including the requirements for their breeding environment (Withaningsih et al., 2019). On the other hand, it can also stimulate poaching and illegal trade of wildlife as is occurring in Brazil (Paulino et al., 2024). This phenomenon also occurs in the buffer area of the Wan Abdul Rachman of Provincial Forest Park (called *Taman Hutan Raya*, Tahura WAR) in Lampung (Maryanto et al., 2021; Kukangku, 2023). This provincial forest park nowadays is situated as a "hot spot" surrounded by the urban human ecology areas of Bandar Lampung Capital City and adjacent or overlapping Pesawaran, as well as the South Lampung

Regency. There still exist much illegal trading found in traditional and online markets (Nuraeni et al., 2018), indicating that law enforcement (Ritten et al., 2021; Roy et al., 2024) and community education or extension services have not been effective (Nurhaida et al., 2011; Yolanda et al., 2020). This situation reflects the urgent needs to achieve the SDG 15 pilar.

In line with efforts to build emotional intelligence and self-awareness from within, Vucetich et al. (2021) and Dushkova et al. (2024) argue that making individuals aware of the importance of wildlife conservation is an urgent need to effectively implement legal aspects. Deschênes et al. (2022) emphasize that any action that is motivated by the individual's internal awareness will feel more comfortable for the individual concerned than due to coercion from other parties, especially those arising from the threat of legal punishment. Such awareness processes can stimulate feelings of sympathy towards animals (Miralles et al., 2109). If sympathy is fostered and maintained sustainably, it will foster empathy that wild animals have the right to live, prosper, reproduce, and avoid extinction (Rülke et al., 2020). Even with this feeling of compassion, we finally came to the belief that the extinction of a species is also a threat to the continuity of human civilization as is the message of ecocentrism ethics (Mascaro et al., 2020). Therefore, even though we have to convey articles about legal threats, each message must be designed to evoke a sense of comfort so that it is not always scary. According to Nurahida et al. (2007) and Denis et al. (2019), processing pleasant information in the human brain system will be more effective and stored permanently than forceful messages. Information like this has a greater chance of developing character and forming animal-loving behavior (Castillo-Huitron et al., 2020), which is an initiation of compassion-based conservation towards protected wild animals (Beausoleil et al., 2020), such as the slow loris.

In the context of developing a compassionate conservation attitude towards EDS, Nurhaida (2011) and Nurhaida

et al. (2011) proved that the acceptability of message content is very dependent on the variables of demographics, knowledge, education, and ethnic cultural background, accompanied by individual emotions as well. All of these variables will influence the effectiveness of the communication process in the extension program (Bakri et al., 2021). As emphasized by Choudhury et al. (2022), until now there is still limited understanding of the role of demographic variables, education, knowledge, and ethnicity in influencing the compassionate feeling toward EDS. Based on this background, we conducted this research, therefore, to determine the role of variables utilizing demographic, ethnic, and human emotional variables to increase compassion feeling toward the slow lorises. The results of this research can be used as a basis for developing educational media content for slow lorises specifically for communities living in buffer areas in various conservation forest areas.

Methods

The study area This research was conducted from October to November 2023 at Batu Putuk and Sumber Agung Villages (suburban of the Capital City of Bandar Lampung) and Wiyono Village (suburban of Gedong Tataan Town, the Capital City of Pesawaran Regency). The three villages are directly adjacent and overlap to the (Tahura WAR), Lampung Province, which means it is a buffer zone for this strict conservation area (Figure 1). A list of household heads was used to randomly select potential respondents. A door-to-door survey was conducted until 50 families agreed to be interviewed. The survey continued in the second and third villages, bringing the total number of respondents to 150. Respondents representing each sample household were allowed to be immediate family members: father, mother, or adult children aged 15 years and older. Each respondent was shown a photograph of a slow loris measuring 20 cm 30 cm, which was printed on white glossy paper with full-color printing (Figure 2).

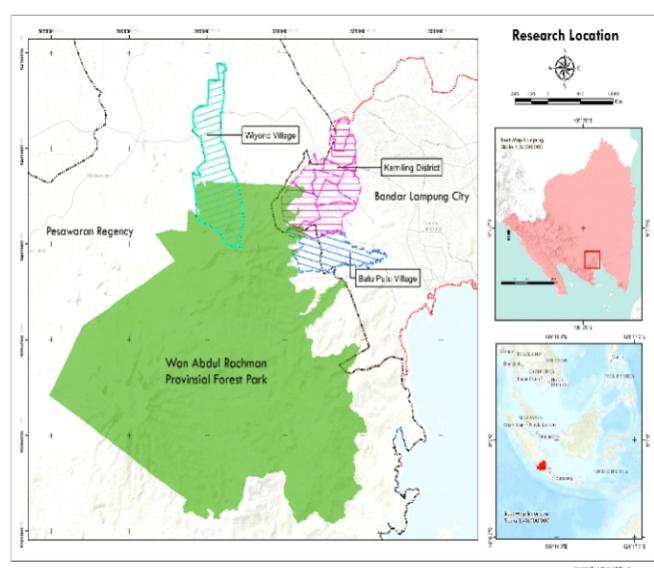


Figure 1 Research location.



Figure 2 Slow loris, *Nycticebus bancanus* Source: Wikipedia (2018).

Having shown the picture of the slow loris, interviews were conducted to obtain data that would be used as a response variable or as a predictor variable. This method refers to what has been done by Nyhus et al. (2003) and Miralles et al. (2019).

In summary, Table 1 presents the response variables, the five predictor variables, the symbols used in the model, the measurement scale used, the method of data acquisition, and the data scoring.

Model postulate applied and hypotheses As the implication of the response variable scores was in the binary unit, the log-linear postulate model was employed (Buya et al., 2020) to investigate the effect of emotional involvement, demographic, and ethnicity variables on arousing compassion feeling toward slow loris (*Nycticebus bancanus*). The model is expressed as shown in Equation [1].

$$\ln \left\{ \frac{P(\text{COMPASSION})}{1-P(\text{COMPASSION})} \right\}_i = \beta_0 + \beta_1[\text{AGE}]_i + \beta_2[\text{GEND}]_i + \beta_3[\text{KNOW}]_i + \beta_4[\text{D}_1\text{ELEMNT}]_i + \beta_5[\text{D}_1\text{JUNIOR}]_i + \beta_6[\text{D}_1\text{SENIOR}]_i + \beta_7[\text{D}_2\text{FSUND}]_i + \beta_8[\text{D}_2\text{FLAMP}]_i + \beta_9[\text{D}_3\text{MSUND}]_i + \beta_{10}[\text{D}_3\text{MLAMP}]_i + \beta_{11}[\text{D}_4\text{LOVE}]_i + \beta_{12}[\text{D}_4\text{DISGT}]_i \quad [1]$$

note: \ln is the math operator of logarithm using the natural number or $e = 2.718281\ldots$; $P(\text{COMPASSION})_i = 1$ is the probability of the i^{th} respondent feeling compassion for the

slow loris; 1 [$P(\text{COMPASSION})=1$] is the probability of the i^{th} respondent not feeling compassion the slow loris; i is the respondent number (1, 2, 3, ..., 150); $\beta_0, \beta_1, \beta_2, \dots, \beta_{12}$ are model parameters; ξ_i is the errorness parameter; $[\text{D}_1\text{ELEMNT}]_i$ is elementary level education; $[\text{D}_1\text{JUNIOR}]_i$ is junior high school level; $[\text{D}_1\text{SENIOR}]_i$ is senior high school level; $[\text{D}_2\text{FSUND}]_i$ is a Sundanese father; $[\text{D}_2\text{FLAMP}]_i$ is a Lampungese father; $[\text{D}_3\text{MSUND}]_i$ is a Sundanese mother; $[\text{D}_3\text{MLAMP}]_i$ is Lampungese mother; $[\text{D}_4\text{LOVE}]_i$ is the love emotion; $[\text{D}_4\text{DISGT}]_i$ is the disgusted emotion.

The working hypothesis can be expressed as follows:

H_0 : There would be none of the variables specified in the model that significantly affect the probability of the respondent feeling compassion for the slow lorises ($\beta_1 = \beta_2 = \beta_3 = \dots = \beta_{12} = 0$).

H_1 : There would be at least one variable specified in the model that affects the probability of the respondent who feels compassion for the slow lorises ($\beta_1 = \beta_2 = \beta_3 = \dots = \beta_{12} \neq 0$).

The optimization of model parameters was carried out using Minitab 16 software. Hypotheses and goodness-of-fit testing for models were employed using the Gald statistical test, whereas the significance of each parameter was determined using the Wald statistic test at a 95% confidence level (Gudicha et al., 2017).

Results

First of all, it is necessary to present the research results section so that it is more convenient to discuss the causal relationship between the response variable (COMP) and explanatory variables employed in the research.

Table 1 The research variables, symbol used, measurement data scale, and acquisition method as well as their scoring

Variables	Symbol	Data scale	Data acquisition method	Data scoring
I. Respons	[COMP]	Binary	Would you empathize if this animal become extinct?	= 1 if yes, = 0 if no
<hr/>				
<hr/>				
II. Predictor				
<i>1. Demographic</i>				
Age	[AGE]	Year	How old are you?	Integer number
Gender	[GEND]	Binary	Please fill in your gender.	= 1 if man, = 0 if other
Know firsthand	[KNOW]	Binary	Have you ever met firsthand this animal?	= 1 if yes, = 0 if not
<i>2. Education level (Reference: =0 if Never schooling)</i>				
Elementary	[\text{D}_1\text{ELEMNT}]	Dummy		= 1 if elementary, = 0 if others
Junior High School	[\text{D}_1\text{JUNIOR}]	Dummy	What is your level of education?	= 1 if Junior High School, = 0 if others
Senior High School	[\text{D}_1\text{SENIOR}]	Dummy		= 1 if Senior High School, = 0 if others
<i>3. Father ethnicity (Reference: Javanese = 0)</i>				
Sundanese father	[\text{D}_2\text{FSUND}]	Dummy		= 1 if Sundanese, = 0 if others
Lampungese father	[\text{D}_2\text{FLAMP}]	Dummy	What is your father's tribe?	= 1 if Lampungese, = 0 if others
<i>4. Mother ethnicity (Reference: Javanese = 0)</i>				
Sundanese mother	[\text{D}_3\text{MSUND}]	Dummy		= 1 if Sundanese, = 0 if others
Lampungese mother	[\text{D}_3\text{MLAMP}]	Dummy	What is your father's tribe?	= 1 if Lampungese, = 0 if others
<i>5. Emotion (Reference: No emotion involvement = 0)</i>				
Love	[\text{D}_4\text{LOVE}]	Dummy	Please indicate your feelings for this animal: love, neutral, or disgust.	= 1 if feels love, = 0 if others
Disgusted	[\text{D}_4\text{DISGT}]	Dummy		= 1 if feels disgusted, = 0 if others

Respondents' characteristic description To provide a general overview of the characteristics of the 150 respondents. Figure 3 presents the distribution of the proportions of each variable observed in this study.

The goodness-of-fit of the model achieved The results of the optimization of model parameters (the Wald statistics test) are presented in Table 2.

At the bottom of Table 2, the results of the goodness-fit test of the model obtained (the Gald statistics test) are presented. The Gald statistics show a p -value = 0.000, indicating that the 12 predictor variables applied can effectively predict the probability of everyone arousing compassion [COMP]. In other words, the confidence level achieved by the model is more than 99.99%. This finding can be used as a claim that the model obtained from this research has a very high match with natural reality in the field.

Discussion

The validity of model achive Based on Table 2, particularly the results of the Gald and Wald statistical tests, the model

can be expressed as shown in Equation [2].

$$\ln \frac{P(\text{COMPASSION}=1)}{1-P(\text{COMPASSION})} = -6.6961 + 0.0414[\text{AGE}]_i + 1.4943[\text{GEND}]_i + 2.4558[\text{KNOW}]_i + 1.0174[\text{D}_1\text{ELEMT}]_i + 0.2760[\text{D}_1\text{JUNIOR}]_i + 2.5806[\text{D}_1\text{SENIOR}]_i + 0.9818[\text{D}_2\text{FSUND}]_i + 3.5894[\text{D}_2\text{FLAMP}]_i + 2.6740[\text{D}_3\text{MSUND}]_i + 1.9370[\text{D}_3\text{MLAMP}]_i + 1.8189[\text{D}_4\text{LOVE}]_i + 1.7522[\text{D}_4\text{DISGT}]_i \quad [2]$$

note: \ln the is math operator of logarithm using the natural number or $e = 2.718281\ldots$; $P(\text{COMPASSION})_i = 1$ is the probability of the i^{th} respondent feeling compassion for the slow loris; $1 - P(\text{COMPASSION})_i = 1$ is the probability of the i^{th} respondent not feeling compassion for the slow loris; i is the respondent number (1, 2, 3, ..., 150); $\beta_0, \beta_1, \beta_2, \dots, \beta_{12}$ are model parameters; ξ_i is the errorness parameter;

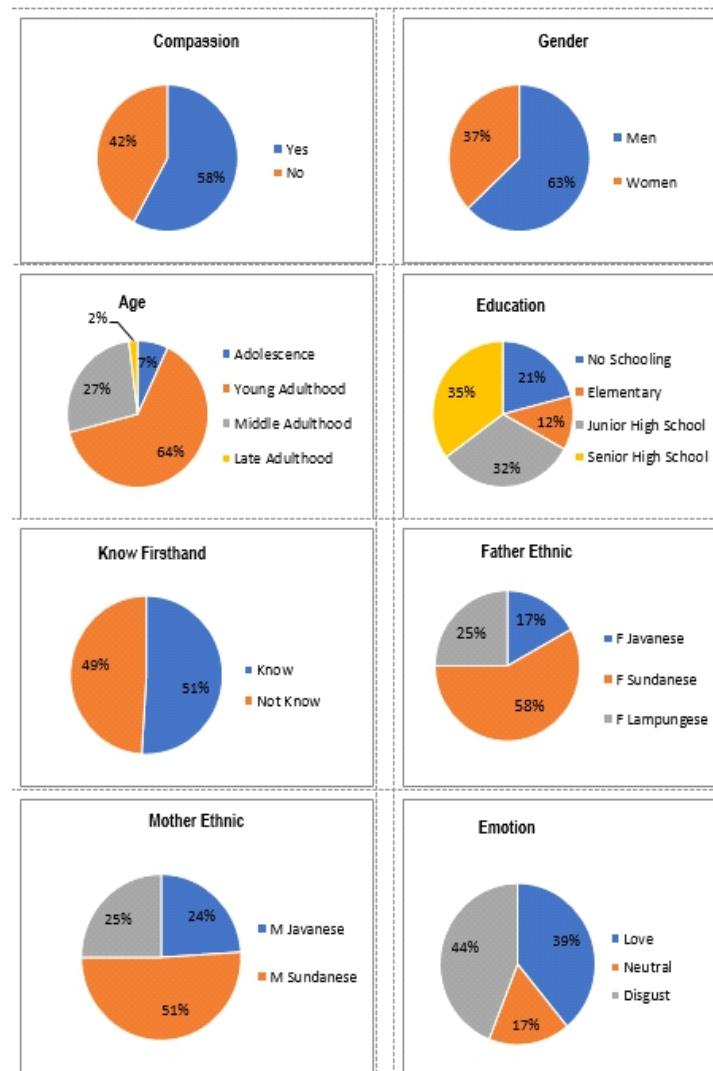


Figure 3 Respondents characteristic (n = 150).

Table 2 Wald test of the influence of demographic, education, ethnicity, and emotion variables on [COMP]

Variable group	Symbol	Coef- ficient	Std. error coefficient	Z statistic	p- value	Odds ratio	The 95% confident interval of odds ratio	
Variable							Lower	Upper
Constant	-	-6.6961	2.1954	-3.05	0.002	-	-	-
<i>Demographic</i>								
Age (year)	[AGE]	0.0414	0.0296	1.40	0.161	1.04	0.98	1.10
Gender (Ref.: men = 0)	[GEND]	1.4943	0.6705	2.23	0.026	4.46	1.20	16.58
Know firsthand (Ref.: know = 1)	[KNOW]	2.4558	0.6922	3.55	0.000	11.66	3.00	45.26
<i>Education Level</i> (Reference: Never schooling = 0)								
Elementary	[D ₁ _ELEMNT]	-1.0174	1.1183	-0.91	0.363	0.36	0.04	3.24
Junior High Sch.	[D ₁ _JUNIOR]	-0.2760	1.0042	-0.27	0.783	0.76	0.11	5.43
Senior High Sch.	[D ₁ _SENIOR]	2.5806	1.0981	2.35	0.019	13.20	1.53	113.61
<i>Father ethnicity</i> (Reference: Javanese = 0)								
Sundanese father	[D ₂ _FSUND]	0.9818	0.8971	1.09	0.274	2.67	0.46	15.49
Lampungese father	[D ₂ _FLAMP]	3.5894	1.29000	2.78	0.005	36.21	2.90	453.83
<i>Mother ethnicity</i> (Reference: Javanese = 0)								
Sundanese mother	[D ₃ _MSUND]	2.6740	1.1016	2.43	0.015	14.50	1.67	125.61
Lampungese mother	[D ₃ _MLAMP]	1.9370	0.9625	2.01	0.044	6.94	1.05	45.76
<i>Emotion</i> (Reference: No emotion involvement = 0)								
Love	[D ₄ _LOVE]	1.8189	0.83824	2.17	0.030	6.17	1.19	31.88
Disgusted	[D ₄ _DISGT]	-1.7522	0.76106	-2.30	0.021	0.17	0.04	0.77
Log-likelihood = -37.233	Test that all slopes are zero: G = 129.622; DF = 12; p-value = 0.000							
	Note: G = Gald statistic, DF= Degree of freedom							

[D₁_ELEMNT]_i is elementary level education; [D₁_JUNIOR]_i is junior high school level; [D₁_SENIOR]_i is senior high school level; [D₂_FSUND]_i is a Sundanese father; [D₂_FLAMP]_i is a Lampungese father; [D₃_MSUND]_i is a Sundanese mother; [D₃_MLAMP]_i is a Lampungese mother; [D₄_LOVE]_i is the love emotion; [D₄_DISGT]_i is the disgusted emotion.

The model that has been tested for goodness-of-fit can thus provide a very high level of accuracy (more than 99.99%) if used to compare the magnitude of [COMP] for each change in each unit for the twelve predictor variables tested. In other words, the significance of the parameter sensitivity of each predictor variable has a confidence level of more than 99.99%. Because it uses a log-linear model, the magnitude of change in each unit of the predictor variable uses the Odds Ratio indicator obtained from the Minitab output (Table 2, Column 7). Next, we can evaluate the sensitivity of the parameters for the twelve parameters tested in this research.

The demographic role Among the three demographic group variables, only age has a significant role in influencing the decision to agree with the tightening protection for slow lorries [COMP]. Meanwhile, both the gender variable [GEND] and previously known firsthand [KNOW] have very significant effects (Table 2).

The role of age The first group of variables tested for their influence on arousing affection [COMP] was age [AGE]. As illustrated in Figure 3, by referring to Erickson (1963), Gillear (2020), and Hochberg et al. (2020), the level of maturity development of individual respondents based on biological, psychological, and socio-cultural considerations

can be determined to be as follows: 7% teenagers, 63% young adults, 27% middle-aged adults, and 2% late adults. However, this age distribution apparently does not have a significant effect on [COMP]. These age categories generally have very different maturity in the way they think, in how they control emotions, and how they make decisions (Musavira et al., 2023). However, the results of this study (Table 2) prove that [AGE] generally has no significant effect in arousing respondents' feelings of compassion [COMP]. In this context, as stated by Beadle et al. (2019), there is no difference in the level of sympathy or empathy of respondents of all age groups regarding the fate of EDS conservation, such as slow lorises. Perhaps this is related to the phylogenetic distance between humans and slow lorises, which is quite far in the process of evolution of both (Blair et al., 2024). The implications of these findings include that designers of wildlife protection campaign media, especially for slow lorises, do not need to discriminate in creating message designs by considering the variable age of the target audience. That way, some unnecessary complications can be avoided to achieve the effectiveness of the content of the message being communicated.

The role of gender The second variable is the influence of gender. As can be seen in Table 2, the effect of gender is very significant. It has been proven that there is a gender bias phenomenon in giving affection to slow lorises. Women have a higher level of compassion [COMP], namely 4.46 times more than men. In other words, men are equal to 1/(4.46) = 0.22 times women. This difference is also highly significant, with a confidence level of 97.4% (p-value = 0.026). In this context, women generally have deeper emotional involvement, especially in relation to legally protected

animals. According to Fiorenzato et al. (2024), women's intelligence works mostly on the right brain; they are relatively more thorough and more careful. Likewise, women tend to have strong feelings for cute wild animals, such as slow lorises.

This finding also confirms the research results of Ma'rufia et al. (2019), namely that the spirit of caring for and nurturing women is generally higher than men's, and women tend to be more pro towards animal conservation. This caring and nurturing nature is largely controlled by the role of several hormonal activities that influence individual emotions and decisions (Kimmig et al., 2021), which will be discussed below, in the role of emotions segment. However, the epigenetic relationship between human caring and nurturing traits for wildlife is still complex and still very dark to formulate (Aguilera et al., 2010).

The role of firsthand experience The direct stimulus can be very different from the response given by each individual. Likewise for the stimulus in the form of the experience of previous firsthand knowledge [KNOW]. Respondents who had met or previously seen firsthand [KNOW] responded 11.66 times (p -value < 0.001) in [COMP] than those who had never seen before. In contrast, indirect experiences, such as reading or simply looking at pictures or films, can provide information and knowledge but may not have the same emotional or sensory impact as direct experiences. Therefore, although indirect experience is also important and useful, direct experience tends to have a stronger impact on the formation of memory and learning. Similarly, direct experience such as seeing the slow loris have a stronger impact on memory formation and learning (Quarles et al., 2023). For this reason, individuals who have seen or met firsthand with a slow loris directly may have an easier time generating feelings of compassion, sympathy, and empathy (Poindexter et al., 2023). The involvement of human emotions in the form of compassion, empathy, and sympathy may be caused by the shape or physical appearance of the slow loris, which is similar to a cat. Slow lorises and the cat look equally cute. The memory stored in the brains of people who have seen slow lorises directly will be associated with the domestic animal as a cat (Mendl et al., 2022). With the emergence of a strong feeling of sympathy or even empathy, the respondent's compassion for slow lorises, the cat-like animal, will rise significantly.

The role of education level Education in general can overcome limited rationality so that individuals can think more rationally (Kim et al., 2018) and be able to calm emotions in adapting to situations around them and increasing empathy (Bevir et al., 2011). Additionally, formal education can also instill stronger ethical values, including ethics in treating protected wild animals (de Oliveira et al., 2020). All these intellectual abilities will be useful in taking a stance to reject or approve a noble idea such as wildlife conservation, such as the fate of slow lorises in the Tahura WAR. The research results provide evidence for this argument. Respondents with a high school education [D₁_SENIOR] have a deeper compassionate attitude [COMP], which is 13.20 times higher than respondents with

a lower level of education. This difference is highly significant with a confidence level exceeding 98.1% (p -value = 0.019). Meanwhile, respondents with elementary school [D₁_ELEMT] and middle school [D₁_JUNIOR] education showed a similar attitude towards the plan to tighten protection of slow lorises as respondents who had not completed elementary school. This finding reflects that the biology or science curriculum is only able to arouse feelings of sympathy for lorises at the high school level, not yet at the junior high school level and below. Quarles et al. (2023) also reported similar findings in Thailand.

This fact, therefore, needs to be taken into account to differentiate the form of message design (Dalton et al., 2017) for audiences with Junior High School [D₁_SENIOR] education compared to those with lower education for the sake of the effectiveness of their literacy (Hanci, 2022). For promotional media to be effective as message carriers, the form of both literal and visual messages needs to be created more simply so that they are easy to understand for those with lower levels of education (Meppelink et al., 2015), especially for message content about wildlife protection (Nurhaida et al., 2007; 2011), such as slow lorises for suburban audiences like the area of this research.

The role of ethnicity According to Pardede et al. (2024), Lampung Province, which is the gateway to Sumatra Island, has long become multiethnic. Wulandari et al. (2021) revealed that for the very first time, through a massive migration process since 1905 when the Dutch Colonial Government brought in workers to develop cash crop plantations. Wulandari et al. (2021) also explained that multiethnic interactions occur in other areas of Lampung; currently Bandar Lampung and its supporting satellite cities, including Pringsewu and Gedong Tataan (capital city of Pesawaran Regency), are inhabited by many other ethnicities besides Lampung people, primarily Javanese and Sundanese. Thus, these three ethnicities are dominant in terms of numbers of people who live in the buffer zone of Tahura WAR, the Lampung Province Forest Park (Figure 1). It seems that interethnic interactions have formed distinctive behaviors, which influence attitudes toward wildlife conservation.

Father's ethnicity There are three tribes in this research area, namely Javanese, Sundanese, and Lampung. Therefore, each respondent can be assessed individually based on their father's lineage and mother's lineage. Regarding this variable, it was found that respondents whose fathers were of Sundanese descent [D₂_FSUND] responded to compassion [COMP] not significantly differently from respondents whose fathers were of Javanese descent (p -value = 0.274). However, respondents whose fathers were from the Lampung ethnic group [D₂_FLAMP] had a feeling of compassion [COMP] 36.21 times greater than respondents whose fathers were from the Javanese ethnic group. This difference was very significant with a confidence level above 99.5% (p -value = 0.005). As mentioned by Nurdin et al (2018), it seems that the Lampung ethnic group is native and has adapted to the forest environment. A very strong sense of empathy for wild animals such as slow lorises has been

instilled for generations. Contrast with the Javanese or Sundanese ethnic groups, who are migrants from Java Island who have almost never experienced interaction with natural forest life. In this context, there is no need to implement discriminatory policies when seeking individuals with paternal lineages from the three ethnic groups residing in this research area. Similarly, when designing campaign strategies or promoting the protection of slow lorises in the WAR Tahura buffer area, it is important to consider the typical Javanese ethnic temperament, which is indirect rather than straightforward.

The typical Javanese ethnic temperament is rarely straightforward; instead, it is indirect (Ponka et al., 2019). As a consequence, it is not uncommon to be accused of being ambiguous or, even more extreme, of being two-faced. This characteristic originates from a communal culture vis-a-vis an individual culture, which adheres to the principle of caution when dealing with parties who are not known closely. This communal culture places a burden on each person, meaning that individual mistakes are not entirely individual mistakes that cannot be borne by oneself but instead become a collective burden on the group (Harryadi, 2020). In contrast, Lampung ethnic groups may have a more direct way of expressing opinions (Sinaga, 2021). However, it is important to note that these are general observations and individual behaviors can vary widely within any cultural or ethnic group.

The implication of these findings is that communication media designers, especially those related to campaigns to protect wild animals such as slow lorises, must also take these factors into account when designing campaign media messages. In particular, when designing communication messages for men of Sundanese or Javanese ethnicity, it is necessary to use a literal form of message that implicitly contains messages that are taboo (Landim et al., 2023), and innuendo, or parables are deemed more appropriate (Nurhaida et al., 2011), while for Lampung ethnic men, it is recommended to use direct message language.

Mother's ethnicity The role of the mother's ethnicity is more interesting. When compared with Javanese ethnic, respondents whose mothers were Sundanese [D₃_MSUND] and whose mothers were Lampungese ethnic [D₃_MLMP] were, respectively, 14.50 (*p*-value = 0.015) and 6.94 (*p*-value = 0.044) times more likely to be Javanese ethnic. It should be highlighted here that, as mentioned in the previous paragraph, the Lampung ethnic, both male and female respondents, have significant differences compared to the Javanese ethnic in terms of [COMP] for slow lorises. This means that for the Lampung ethnic group, there is no gender bias phenomenon. However, on the contrary, among the Sundanese ethnic group, there is a gender bias towards mothers.

These findings provide supporting evidence that the male sex hormone is 70% testosterone compared to 30% estrogen. Meanwhile, for females, estrogen is the more dominant hormone. No reports have been found of differences in empathetic or compassionate responses to wild animals. However, according to Kimmig et al. (2021), the empathetic response is greatly influenced by the status and concentration of estrogen and this reaction becomes stronger for someone

who is known to be suffering. In connection with this finding (while the absence of gender in the Lampung ethnic group is not yet understood), it could have implications for the conservation of slow lorries targeting better if it is aimed at women who have greater empathy than men. Furthermore, this targeting focus needs to be taken into account in designing messages in the slow loris protection program.

The human emotion role In line with Vedernikova et al. (2021), emotions are complex psychological states that arise in response to certain stimuli or situations, involving physiological changes, subjective feelings, or behavioral expressions. Meanwhile, according to Tobore (2020), love is a deep emotional bond between individuals, which includes affection, attention, passion, and attachment. There are three different types of love, namely romantic love, platonic love, and familial love. Among the three, the last one is more appropriate for expressing human emotions to EDS such as slow lorises. The opposite of love or affection is dislike, the extreme of which is disgust. According to Sarabian et al. (2023), this feeling is an adaptive system that is thought to have developed to reduce risks, for example, to avoid pain or illness. This is related to the adaptation of behavioral, cognitive, and physiological responses that enable animals to avoid and/or eliminate threats, including parasites, pathogens, or toxic substances.

The results of this study show that respondents who stated they had [D₄_LOVE] for slow lorises would provide a response [COMP] of 6.17 times greater than individuals who were not emotionally involved (neutral). This strengthening is very significant with an exceeded confidence level of 97.0% (*p*-value = 0.030). In contrast, disgust reduced the [COMP] response by only 0.17 times compared to individuals who were not emotionally involved with slow lorises. This decrease was also very significant with a confidence level of 97.7% (*p*-value = 0.023). Disgust towards slow lorises can reduce empathy for the fate of these wild animals. Empathy is essential for social functioning and social coherence. Such feelings can be influenced by modulating factors such as familiarity, liking, or love, all three of which are forms of expression of emotional closeness (Kimmig et al., 2021).

In line with these findings, Wojnarowski et al. (2022) revealed that the hormones estrogen and estradiol in women have an important role in controlling emotions of sympathy, empathy, and compassion. Even though this is true, there is not much strong evidence regarding the role of these two hormones in modulating recognition and affection as components of empathy, including towards wild animals such as slow lorises. The implication of these findings for promoting the protection of slow lorises is the need to increase the empathy and compassion components of each community in forest buffer zones as a strategy that is considered effective in generating sympathy (Kansky & Maassarani, 2022) towards slow lorises. The emergence of this feeling of sympathy is a stepping stone for the emergence and development of a feeling of empathy for the fate of slow lorises, which is also equivalent to a feeling of empathy for fellow humans. Message designers should consider these findings (Nurhaida et al., 2011; Tsourtanidou et al., 2020) to increase the effectiveness of media literacy for wildlife

conservation. However, it is very important to note that in order to be more valid, it is very important to conduct research using live slow lorises instead of photographs.

Conclusion

This study proves that the emergence of compassion for slow lorises: 1) is higher in women than men, individuals who have known them firsthand than others, those who have graduated from high school or college, those whose fathers are of Lampungese ethnicity compared to Javanese or Sundanese ethnicity, those whose mothers are of Lampungese or Sundanese ethnicity compared to Javanese ethnicity, and individuals who have feelings of love than others, and 2) is weaker for individuals who feel disgusted with slow lorises. It is recommended that research be conducted using live slow lorises, instead of photographs, so that the results are better and more valid if used to design communication media in order to strengthen slow loris conservation.

Disclaimer

We are not in a conflict of interest with this research result.

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