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Exploring antecedent factors influencing empathy for animals among veterinary students & scientists: A comprehensive study

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Abstract

Empathy toward animals is increasingly recognized as a cornerstone of compassionate veterinary care, essential for understanding and responding to the physical and emotional needs of animal patients. Current investigation was carried out to study the correlation between empathy scores of 50 veterinary students and 50 faculty members with their antecedents variables at Lala Lajpat Rai University of Veterinary and Animal Sciences, located in Hisar. The research aimed to examine how various antecedent factors such as age, gender, educational background, pet ownership history, belief in animal cognition, religious beliefs, economic motives, vegetarianism, conscientiousness, and extraversion relate to empathy levels in these personalities. It was observed that belief in animal mind, gender was positively and significantly correlated to level of empathy with animals. Students in later years showed lower level of empathy. This study highlighted the need for further exploration into how veterinary education impacts empathy levels among both veterinary students and scientists.

Keywords: Empathy, antecedents factors, students, scientists

Introduction

Empathy for animals among veterinary professionals is increasingly recognized as a fundamental attribute that not only enhances clinical outcomes but also shapes ethical decision-making and professional identity. Empathy plays an important role in interpersonal relationships and it shapes relationships between human and non -human species, affecting the way animals are treated and cared for (Leon *et al.*, 2020) ^[13]. Because empathy is related to greater clinical competence and facilitates the acquisition of information for diagnosing, prescribing therapies, and identifying and treating animal pain, empathy is an essential competence to be strengthened during professional training (Romero *et al.*, 2021)^[16].

The development of empathy in veterinary students and faculty is influenced by a myriad of factors, including personal experiences, educational experiences, and societal attitudes towards animals. Scientific evidence from different disciplines, including psychology, sociology and animal welfare, shows that the relationship between humans and animals is complex, multifaceted, ambivalent and even paradoxical, with different consequences for animals and humans (Serpell, 2015; Amiot *et al.*, 2016) ^[17, 1]. Exploration of antecedents variables comprehensively is essential to devise effective educational interventions and create a supportive learning environment that fosters empathy among veterinary professionals. These efforts are

critical not only for improving the care and welfare of animals within veterinary practice but also for enhancing the mental health and resilience of veterinary professionals.

Current research seeks to uncover the complex interplay of personal, educational, and societal factors that shape empathetic attitudes and behaviors within the veterinary community. Findings of study will provide actionable insights for institutional policies, curriculum development, and professional training programs aimed at promoting empathy and enhancing animal welfare within veterinary practice. To date, no empirical research has been conducted within the state to examine how individual traits influence the levels of empathy among veterinary students and scientists. So current study was planned to explore the effect of antecedents variables on Empathy level of veterinary scientists and students with animals in Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana. So understanding and fostering empathy affecting variables among veterinary students and scientists will be helpful for ensuring compassionate and ethical care in veterinary medicine.

Materials and Methods

The current study involved a total of 100 participants, comprising 50 scientists and 50 veterinary students enrolled at Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar. To select students, a random sample of ten

individuals was drawn from each academic year of the B.V.Sc and AH program, totaling 50 students. Similarly, scientists were selected using a simple lottery method.

Following a comprehensive review of existing literature, a selection was made of ten antecedents variables related to personality that are anticipated to impact the attitudes of students and scientists towards animal welfare. These independent variables were age, gender, educational level, pet ownership history, vegetarianism, belief in mind, conscientiousness, extraversion, economic motivation and religiousness. These variables were opeartionalized as presented in Table 1.

Table 1: op	perationalization	of Independent	Variables
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Sr.no.	Antecedents	Operationalization
1.	Age	Respondents' chronological age
2.	Gender	State of being male or female
3.	History of pets	Experience with pet ownership
4.	Level of education	Academic qualification of the respondents
5.	Conscientiousness	Using a version of five factor personality inventory (Costa and MacCrae, 1985) ^[4]
6.	Extraversion	Using a modified version of the Five Factor Personality Inventory (Costa and MacCrae, 1985) ^[4]
7.	Religiousness	Scale developed by Templer et al. (2004) ^[19] with minor modification
8	Economic motivation	Scale developed by Supe (1969) ^[18]
9.	Vegetarianism	Position on a scale indicating vegetarianism or meat-eating habits
10.	Belief in mind	Scale developed by Hills (1995) ^[10] with appropriate modifications

Results and Discussion

The relationship observed between the antecedent variables and extent of empathy among the respondents in the study is presented in Table 2. As can be seen from the Table, gender belief in animal mind and economic motivation were significantly associated with the extent of empathy. However, the trend is not similar in case of students and scientists. The students empathy scores were seemingly sensitive to their age and stage of the degree programme.

Table 2: Correlation between antecedent variables and empathy scores of the respondents

S. No	Indonondont Variables		Category of respondents and r-value			
5. 10.	independent va	independent variables		Scientists (n=50)	Total (n=100)	
1	Age		-0.327*	0.115	-0.051	
2	Gender		0.349*	0.095	0.228*	
3	Educational qualification		-0.354*	0.048	-0.168	
4	History of pets		0.0191	0.156	0.109	
5	Vacatarianiam	Freq.	0.154	-0.046	0.042	
3	vegetarianism	Non-Veg.	-0.188	-0.039	-0.109	
6	Conscientiousness		0.048	-0.057	0.017	
7	Extraversion		0.187	-0.181	0.004	
8	Belief in animal mind		0.388**	0.718**	0.477**	
9	Religiousness		0.180	0.065	0.092	
10	Economic mot	ivation	-0.066	-0.431**	-0.202*	

p*<0.05, *p*<0.01

Distribution of empathy scores of respondents of different age groups

Apparently the age of the respondents was not related with the empathy scores. But the students' scores were significantly negatively correlated (Table 2). This goes well with our hypothesis that the respondents have largely maintained to stick to the traditional Indian cultural values irrespective of their age differences. On the other hand, Kellert and Berry (1981)^[11] suggested that generally younger people are more concerned about animal use than older people. Classification of the respondents based on their age is presented in Table 3. It can be seen that the middle aged scientists scored highest in terms of empathy as compared to other two categories although the differences were small and non significant as tested by one way ANOVA (Table 4).

Table 3: Distribution of empathy scores of respondents of different age groups

			Empathy			
Category	Age (yrs)	Low (66-100)	Medium (101-135)	High (136-170)	Total	Avg score
		F (%)	F (%)	F (%)		
	Young (up to 30)	30(60)	19(38)	1(2)	50	103.52
Students	Middle (31-45)	-	-	-	-	-
	Old (above45)	-	-	-	-	-
Scientists	Young (up to 30)	5(71.43)	2(28.57)	-	7	96.43
	Middle (31-45)	11(63.16)	8(36.84)	-	19	100.11
	Old (above45)	14(58.33)	8(33.33)	2(8.33)	24	101.33
Total	Young (up to 30)	35(63.16)	21(35.09)	1(1.75)	57	99.98
	Middle (31-45)	11(57.89)	8(42.11)	-	19	100.11
	Old (above45)	14(58.33)	8(33.33)	2(8.33)	24	101.33

Table 4: Comparison of empathy scores of respondents of different age categories using one way ANOVA

ANOVA							
Source of Variation	SS	Df	MS	F	P-value	F critical	
Between Groups	100.6447	2	50.32237	0.152768	0.858535	3.090187	
Within Groups	31952.11	97	329.4031				
Total	32052.75	99					

Distribution of empathy scores of respondents of different gender

Gender of the respondents was significantly correlated with the empathy scores of students (Table 5). The gender of the scientist, on the other hand, did not make much difference. Female respondents were having higher extent of empathy than the male respondents (Table 5).

On empathy scores the female respondents scored higher (Table 5). Infact, the effects of gender on attitudes towards animal use are consistent, with males being generally more

supportive of animal use (e.g. Furnham and Pinder, 1990)^[6]. One possible reason for gender differences is social perception because women are socialized to be caring and nurturing, while men are socialized to be less emotional and materialistic.

Feminism leads to a kind of nurture that is strongly linked to concern for animal welfare, while masculinity is associated with less attention to the ethical treatment of other organisms (Herzog *et al.*, 1991)^[9].

Table 5: Distribution of empathy scores of res	spondents of different gender
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			Empathy			
Category	Gender	Low (66-100)	Medium (101-135)	High (136-170)	Total	Avg score
		F (%)	F (%)	F (%)		
Students	Male	24(64.86)	13(35.14)	-	37	100.16
Students	Female	5(38.46)	7(53.84)	1(7.7)	13	113.06
Scientists	Male	30(71.43)	10(23.81)	2(4.76)	42	99.38
Scientists	Female	3(37.5)	5(62.5)	-	8	104.38
Total	Male	54(68.35)	23(29.11)	2(2.53)	79	99.77
Total	Female	8(38.09)	12(57.15)	1(4.76)	21	108.72

Further, the empathy scores of female and male respondents were compared by using Z-test. (Table 6)

 Table 6: Comparison of empathy scores of different gender using

 Z test

Z-Test: Two Sample for Means						
Category	Z value	Z critical one-tail*	Z Critical two-tail**			
Female –male	2.11873**	1.644854	1.959964			

Empathy scores of respondents according to their education level

The empathy scores of students were significantly negatively associated with level of education. As can be, empathy scores of the respondents decreased with the advancement in formal education (Table 7). The students of 1st year of B.V.Sc and AH degree programme scored highest. The empathy scores did suggest that there is some hardening but the extent was not significant (Table 7). Previously Paul and Podberscek (2000) ^[15] conducted a study on veterinary students at two British universities and concluded that the year of study is significantly related to the perceived sentience of dogs, cats and cows, with students in their later years of study rating them as having lower levels of sentience. Fourth year students were less likely than second or third year students to provide analgesia for certain surgeries (Hellyer et al., 1999)^[8]. The probable reasons are not difficult to uncover. In the words of Capaldo, (2004)^[3], the apparently reduced concerns for animal welfare might also, in some cases, represent adaptations that enable veterinary students to withstand what could otherwise be intolerable psychological stresses that result from being required to harm sentient creatures in the absence of overwhelming necessity. During their training, veterinary students are frequently required to harm and kill animals in preclinical subjects such as anatomy (dissection, often of purpose-killed animals or animals from ethically-questionable sources, physiology, biochemistry and pharmacology ("demonstration" experiments on living animals, usually of long-established scientific concepts, with animals usually killed during or at the end of the experiment). Students have also traditionally been required to practice clinical, surgical and anaesthetic skills by anaesthetising healthy animals, conducting surgical procedures on them, and killing any survivors at the end. All these necessities of the professional training may have caused lowering of their perceived sentience about animals.

Empathy scores of respondents based on their pet keeping experience

The correlation of pets was not significantly associated with changes in empathy scores. The respondents who were having pets at the time of the study showed highest empathy scores. Similarly, Driscoll (1992) ^[5] found that pet owners rated animal research as less acceptable than did non-pet owners.

		Empathy				
Category	Education level	Low (66-100)	Medium (101-135)	High (136-170)	Total	Avg
		F (%)	F (%)	F (%)		
	B.V.Sc 1st yr	2(20)	8(80)	-	10	111
	B.V.Sc 2nd yr	5(50)	5(50)	-	10	107.06
Students	B.V.Sc 3 rd yr	7(70)	3(30)	-	10	102.9
	B.V.Sc 4th yr	7(70)	3(30)	-	10	103.2
	B.V.Sc 5 th yr	9(90)	1(10)	-	10	92.9
Scientists	M.V.Sc	7(63.64)	4(36.36)	-	11	99.09
	Ph.D	25(65.79)	11(28.95)	2(5.26)	38	100.63
	OQ	1(100)	-	-	1	95
	B.V.Sc 1st yr	2(20)	8(80)	-	10	111
	B.V.Sc 2nd yr	5(50)	5(50)	-	10	107.06
	B.V.Sc 3 rd yr	7(70)	3(30)	-	10	102.9
Total	B.V.Sc 4 th yr	7(70)	3(30)	-	10	103.2
I otal	B.V.Sc 5 th yr	9(90)	1(10)	-	10	92.9
	M.V.Sc	7(63.64)	4(36.36)	-	11	99.09
	Ph.D	25(65.79)	11(28.95)	2(5.26)	38	100.63
	OQ	1(100)	-	-	1	95

Table 7: Empathy scores of respondents according to their education level

Empathy scores of respondents based on their dietary preferences

Lacto-vegan obtained higher empathy scores (Table 8) than the non– vegetarians respondents. Further, among the nonvegetarians, the respondents who consumed meat diets less frequently scored higher in terms of empathy (Table 9). Vegetarianism was found important factor impacting the empathy with animals (Tables 8 and 9). Vegetarianism is a significant predictor of attitudes toward animal testing and compassion as reported by Furnham *et al.*, (2003) ^[7]. The significant correlation of vegetarianism and higher empathy scores can, at least in part, be understood from the fact that a large number of Indians subscribe to the idea of sentience of all life forms. Perhaps those of respondents who believed in such ideals preferred to stay vegetarian even though their profession ought to utilitarian concepts. The observation that a large number of respondents preferred to stay vegetarian again supports the earlier conjecture made in the study that traditional and cultural values have not been done away by the respondents.

Table 8: Empathy scores of respondents based on their dietary prefere
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		Empathy				A
Category	Vegetarianism	Low (66-100)	Medium (101-135)	High (136-170)	Total	Avg
		F (%)	F (%)	F (%)		Score
Students	Lacto -vegans	7(53.85)	5(38.46)	1(7.69)	13	104.03
Students	Non -vegetarians	23(62.16)	14(37.84)	-	37	102.94
Scientists	Lacto -vegans	13 (72.22)	4 (22.22)	1 (5.56)	18	99.13
Scientists	Non -vegetarians	21 (65.63)	10(31.25)	1 (3.12)	32	94.20
Total	Lacto -vegans	20 (64.52)	9(28.13)	2(6.45)	31	101.58
	Non-vegetarians	44 (63.77)	24(34.78)	1(1.45)	69	98.57

Fable 9: Empathy	scores of responde	nts based on their	frequency of meat	consumption
1 2	1		1 2	1

	Frequency of meat eating			A		
Category		Low (66-100)	Low (66-100) Medium (101-135) His		Total	Avg
		F (%)	F (%)	F (%)		Score
Students	High (≤4)	14(60.87)	9(39.13)		23	101.61
Students	Low (>4)	16(59.26)	10(37.04)	1(3.70)	27	105.15
Saiantista	High (≤4)	12(60)	7(35)	1(5)	20	101.65
Scientists	Low (>4)	21(70)	8(26.67)	1(3.33)	30	99.2
Total	High (≤4)	26(60.46)	16(37.21)	1(2.33)	43	101.63
	Low (>4)	37(64.91)	18(31.58)	2(3.51)	57	102.76

Empathy scores of respondents with different degrees of conscientiousness and of extraversion.

Conscientiousness and extraversion scores were not correlated with the empathy scores of respondents. Classification of the respondents based on their conscientiousness level also did not reveal significant differences. Further classification of respondents based on their extraversion level revealed that those higher degree of extraversion obtained higher scores compared to others. There was lack of uniform trend in so far as the relationships between personality trait (conscientiousness and extravesion) and empathy levels of respondents. They found at least one of the four empathy subscales of Davis' Interpersonal Reactivity Index (IRI) to correlate with each Big Five factor, with the exception of Conscientiousness. Feeling types are believed to make decisions based on compassion and empathy and they tend to show more favourable attitude and empathy with animals (Broida *et al.*,

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1993) ^[2]. It is recommended that more research is needed before conclusions can be drawn about the personality and psychology of animal students and scientists and their relationships to the empathy with animal.

Empathy scores of respondents according to their belief in animal mind

The empathy scores and belief in animal mind appeared were strongly and positively correlated (Table 10). The correlation coefficient between the two was statistically significant thereby indicating that belief in animal mind is a strong precursor for empathy towards animals. The respondents were classified into two categories based on their belief in animal mind (low and high). Table 11 depicts the distribution of respondents with varying level of empathy according to their belief in animal mind. As can be seen from the Table 11, those respondents having stronger belief in animal mind score significantly higher than those who did not believe in animal mind.

The respondents with higher BAM were having greater empathy with animals among all the three groups (Tables 11). The correlation between BAM and empathy with animals was recorded positive and significant (7.1). Our results are somewhat similar to previous studies. Hills (1995)^[10] conducted a study on a sample comprising three groups (animal rights supporters, farmers, and urban public) and suggested that high levels of empathy were necessarily associated with some degree of belief in the mental experience of animals. Likewise, Knight *et al.* (2004)^[12] concluded that participants held different views for different types of animal use, and that belief in animal mind (BAM) was a powerful and consistent predictor of these attitudes.

The relationship between belief in animal mind and empathy may be mediated by conflicting instrumental motivations (Hills, 1995)^[10]. The author cited the findings of Opotow (2005)^[14] in the area of moral exclusion (where she found that conflict and utility mediated the relationship between perceived similarity and moral exclusion) to strengthen his case. Yet, the relationship is not straightforward.

The perceived similarity may only be associated with heightened empathy in the absence of utility; utility in the case of the present study involves the need to use another for one's own benefit (Hills, 1995) ^[10]. One of the most exciting areas of scientific inquiry in this field could be the development of BAM. It is suggested that factors underlying development of such belief should be explored empirically.

Category	Dollof					
	in animal mind	Low (66-100)	Medium (101-135)	High (136-170)	Total	Avg
		F (%)	F (%)	F (%)		
Studente	Low (≤20)	17(76)	7(20)	1(4)	25	98.09
Students	High (>20)	11(44)	14(56)	-	25	108.15
Scientists	Low (≤20)	9(100)	-	-	9	89.56
	High (>20)	25(60.97)	14(34.15)	2(4.88)	41	102.51
Total	Low (≤20)	26(82.35)	7(14.71)	1(2.94)	34	93.82
	High (>20)	36(54.55)	28(42.42)	2(3.03)	66	105.33

The two categories were also compared for statistical significance of differences (Table 11).

Table 11: Comparison of empathy scores of respondents of high and low levels of belief in animal mind using Z test

Z-Test: Two Sample for Means							
Category Z value Z critical one-tail* Z Critical two-tail**							
High-low BAM	2.672**	1.644854	1.959964				

Empathy scores of respondents according to their religiousness

The degree of religiousness of the respondents was weakly correlated with their empathy scores. Further, classification of respondents into categories based on their religiousness revealed that the variation was wider in case of scientists as compared to students (Table 12). The respondents with greater religiousness scored higher for empathy with animals (Table 12) but the correlation between religiousness and empathy was positive and non significant. The findings of religiousness empathy with animals are similar to past studies

Fable 12: Empathy score	es of respondents a	according to their	r religiousness
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				A		
Category	Religiousness	Low (66-100)	Medium (101-135)	High (136-170)	Total	Avg
		F (%)	F (%)	F (%)		Score
Students	Low(≤8)	15(65.22)	8(34.78)	-	23	102.52
	High(>8)	14(51.851)	12(44.444)	1(3.703)	27	104.37
Scientists	Low(≤8)	8(66.67)	4(33.33)	-	12	95.92
	High(>8)	24(63.16)	12(31.58)	2(5.26)	38	101.53
Total	Low(≤8)	23(65.71)	12(34.29)	-	35	99.22
	High(>8)	38(58.46)	24(36.92)	3(4.62)	65	102.95

Empathy scores of respondents based on their economic motivation levels

It was measured with the help of scale developed by Supe (1969) ^[18]. The association between economic motivation and empathy scores of respondents was negative and significant on the whole. But the two were weakly and non-significantly associated in case of students. Further, the respondents were divided in three categories (low, medium and high) based on their economic motivation scores (Table 13). The respondents of low economic motivation category

obtained highest empathy scores in all the three groups of the respondents (Table 13). The negative relationship between economic motivation and compassion for animals can be clarified on the basis of people's perceptions of the 'world' and their general ideological views (Furnham and Pinder, 1990)^{[6].} People who are interested in monkey look at animals from a practical point of view, so they show indifference in their minds and contributing to observed differences.

Table 13: Empathy scores of respondents based	on their economic motivation levels
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Category	Economic motivation	Low (66-100)	Medium (101-135)	High (136-170)	Total	Avg
		F (%)	F (%)	F (%)		
	Low(6-10)	3(50)	3(50)	-	6	107.17
Students	Medium(11-15)	18(69.23)	7(26.92)	1(3.85)	26	101.70
	High(16-20)	9(52.94)	8(47.06)	-	17	105.12
	Low(6-10)	-	1(50)	1(50)	2	147.5
Scientists	Medium(11-15)	26(68.42)	11(28.95)	1(2.63)	38	100.68
	High(16-20)	9(90)	1(10)	-	10	88.8
Total	Low(6-10)	3(37.5)	4(50)	1(12.5)	8	127.34
	Medium(11-15)	44(68.75)	18(28.13)	2(3.12)	64	101.19
	High(16-20)	18(66.67)	9(33.33)	-	27	96.

Further, the three categories of respondents with different economic motivation level were compared using ANOVA

(Table 14). The differences observed were statistically significant.

Table 14: Comparison of empathy scores of respondents of different economic motivation levels using one way ANOVA

ANOVA								
Source of Variation	SS	Df	MS	F	P-value	F crit		
Between Groups	2141.152	2	1070.576					
Within Groups	29911.6	97	308.367	3.471759	0.034975	3.090187		
Total	32052.75	99	1378.943					

Conclusion

The students obtained higher mean score for empathy with animals. The respondents showed low to medium level of empathy and belief in animal mind, gender was positively and significantly correlated to level of empathy with animals (r=0.477**, 0.228*; $p^* < 0.05$, $p^{**} < 0.01$). The economic motivation and year of study for students was negatively and significantly correlated. Students in later vears showed lower level of empathy (r=-0.202*, -0.354*; $p^* < 0.05$, $p^{**} < 0.01$). Conclusively, it is reiterated that human animal relations are complex. Humans nurture both feelings of like and dislike of animals. But with the advancement in civilization, the values are changing rapidly towards non-violence. In this rapidly changing times, the human welfare as an evolving concept & concern will significantly alter the landscape of human animal relations. A better understanding of the human being behavior towards animals requires sustained research. It is suggested that further studies to uncover the role of different cultural. individual and other factors should be undertaken.

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