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## Adults' antecedents of violence and empathy toward animals

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Bu çalışmada yazarlar için herhangi bir çıkar çatışması bulunmamaktadır.  
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#### Abstract

This study aims to examine the relationship between adults' antecedents of violence and their levels of empathy toward animals. The purpose of this study is to reveal the determining influence of family and environmental factors on individuals' empathy and violent tendencies, thereby contributing to reducing violence at the societal level and promoting a more empathetic society. Accordingly, a total of 430 participants aged 18 to 69 were reached. The Socio-Demographic Information Form, Violence Precursor Factors Scale, and Animal Empathy Scale Short-Form were administered to the participants. The results revealed that among the factors influencing adults' tendencies toward violence, "environmental factors" were the most dominant. In addition, the findings showed that as family-related antecedents of violence increased, individuals' empathic feelings toward animals decreased. In other words, as experiences of violence, neglect, maltreatment, or dysfunctional interactions within the family rise, individuals' capacity to empathize with animals' weaknesses. Furthermore, environmental elements such as the broader social environment, peer groups, school settings, media influences, and societal patterns of violence were also found to play a primary role in the development of violent tendencies. The findings reveal that both healthy family relationships and role models in one's social environment are decisive in shaping empathy and violent behaviors toward animals.

**Keywords:** Violence, Animal, Empathy, Environmental Factors, Familial Factors.

#### EXTENDED ABSTRACT

##### Introduction

Violence, in general, refers to all aggressive behaviors that an individual uses to cause physical, psychological, or emotional harm to himself/herself, another person, an animal, or an object. The term "violence precursor" refers to factors that contribute to the emergence of violence or prepare the ground for its formation. Predictive factors for violence can be classified into three categories: biological-physiological, individual-psychological, and environmental factors (Erk, 2023). Explanations of biological and physiological factors that contribute to the emergence of violence emphasize the structure of the brain and the relationships between specific brain regions and violent behavior (Yang & Raine, 2009). In studies on the psychological dimension of violence, the psychoanalytic understanding of the concept of violence comes to the fore (Taubner, Rabung, Bateman & Fonagy, 2017). Finally, a complex interaction occurs when various environmental factors, including family, peer group, school, society, culture, and social media—external to the individual but directly affecting him/her—come together to form and perpetuate violence. Multiple theoretical perspectives—including instinctual, biological, and social-learning approaches—have been proposed to explain violent behavior, suggesting that it may result from the interplay of various factors such as early-life experiences, genetic vulnerabilities, personality characteristics, trauma, psychopathology, impaired impulse control, low self-esteem, and substance use (Roberts, 2002). The concept of empathy is widely accepted as having a significant impact on people's moral behavior and as one of the factors contributing to the tendency to help (Mehrabian & Epstein, 1972). Studies have found that individuals with high empathy for animals tend to be less violent (Lucia & Killias, 2011).

##### Method

The study employed a general screening model, known as the relational screening model, which aims to determine the existence and/or degree of change between two or more variables. Two key variables were identified in this research model: the Predictive Factors for Violence variable served as the independent variable, and Empathy Towards Animals was the dependent variable. Data were collected using three tools: the Socio-Demographic Information Form, the Violence Precursor Factors Scale, and the Animal Empathy Scale Short-Form. Data collection tools were distributed to participants via Google Forms. A simple random sampling technique was used to determine the sampling method. A sample size of 430 people was determined by calculating a 90% confidence interval for each sample group and a 4% margin of error for the unknown population.

### Findings, Conclusion, Discussion, and Recommendations

First, environmental factors dominate the scale of antecedents of violence. In terms of sex differences, male participants were found to have higher antecedents to violence than females in both environmental and familial factors. Conversely, females showed higher empathic responses toward animals than males. Empathic emotions dominate levels of empathy towards animals. Furthermore, the desire to adopt a stray animal is positively correlated with empathic emotions.

Furthermore, it is noteworthy that individuals who support the slaughter or euthanasia of animals have higher scores on factors that lead to violence. Correlation analysis results revealed a significant, weak, and positive linear relationship between environmental factors and familial factors. Furthermore, familial factors that lead to violence negatively influence empathic emotions toward animals and positively influence non-empathic factors. Future studies could explore this relationship more comprehensively by considering variables such as socioeconomic status, childhood experiences with animals, and level of knowledge about animal rights. Social norms, media discourse, environmental stress factors, and animal regulations influence the relationships individuals form with animals. In this context, preventing violence and increasing empathy towards animals are crucial.

### INTRODUCTION

*Violence*, in general, refers to all aggressive behaviors that an individual uses to cause physical, psychological, or emotional harm to himself/herself, another person, an animal, or an object. The term *violence precursor* refers to the factors that contribute to the emergence of violence or that prepare the ground for the formation of violence. Predictive factors for violence can be classified into three categories: biological-physiological, individual-psychological, and environmental factors (Erk, 2023). Explanations of biological and physiological factors that contribute to the emergence of violence emphasize the structure of the brain and the relationships between specific brain regions and violent behavior (Yang & Raine, 2009). In studies on the psychological dimension of violence, the psychoanalytic understanding of the concept of violence comes to the fore (Taubner, Rabung, Bateman & Fonagy, 2017). Finally, a complex interaction occurs when various environmental factors, including family, peer group, school, society, culture, and social media—external to the individual but directly affecting him/her—come together to form and perpetuate violence. These factors could increase an individual's tendency towards violence and make violent acts easier to occur (Erk, 2023).

Multiple theoretical perspectives—including instinctual, biological, and social-learning approaches—have been proposed to explain violent behavior, suggesting that it may result from the interplay of various factors such as early-life experiences, genetic vulnerabilities, personality characteristics, trauma, psychopathology, impaired impulse control, low self-esteem, and substance use (Roberts, 2002). Understanding violent behavior, therefore, requires a comprehensive approach that accounts for both internal predispositions and environmental influences.

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Psychoanalytic theory offers one explanation, as Freud conceptualized aggression as an instinctual behavior rooted in human nature. He argued that human behavior is primarily driven by two fundamental instincts: Eros, the life-preserving drive, and Thanatos, the death-oriented drive, with aggression representing a manifestation of the latter. This death instinct can be directed inwardly or outwardly toward others and the environment (Koç, 2011). Contemporary psychoanalysts, however, challenge Freud's notion that aggression accumulates spontaneously as an internal energy, emphasizing the complex interplay of psychological and relational factors in aggressive behavior instead (Bjorkly, 2006).

From a biological perspective, the human brain contains three primary systems that regulate emotions, notably the amygdala and the central and peripheral regions of the prefrontal cortex. Research has shown that dysfunctions or structural changes in the amygdala and medial prefrontal cortex are linked to aggressive behavior, highlighting the significant role of neurobiological mechanisms in violence (Charney & Blair, 2003). These findings suggest that aggression cannot be fully understood without considering the underlying physiological processes.

Classical behaviorism, in contrast, emphasizes learning as a central factor in the development of behavior. This theory posits that learning occurs through rewards, punishments, and conditioning, and those abnormal behaviors, including aggression, may be acquired through classical and operant conditioning as well as social learning processes (Cüceloğlu, 1997). These mechanisms highlight the extent to which repeated environmental experiences can shape behavioral tendencies.

Social learning theory further elaborates on the influence of the environment, proposing that aggression arises primarily through observation, imitation, and reinforcement of aggressive behavior (Eron, 1994). Cognitive learning theory complements this view by suggesting that when aggressive behaviors result in favorable outcomes, they are reinforced, increasing the likelihood of recurrence (Karlı, 2016). Collectively, these approaches emphasize the interaction between observed behaviors, environmental cues, and consequences in shaping violent tendencies.

Finally, the role of the group or peer environment cannot be overlooked, as individuals often prioritize their group's expectations and values over personal beliefs. Factors such as group size, consensus, social status, face-to-face interaction, loss of personal identity, and the desire for approval can amplify aggressive tendencies. Consequently, even individuals who do not

personally endorse violence may engage in it when immersed in a group with violent tendencies (Karşlı, 2016).

The General Aggression Model (GAM) posits that aggressive behavior emerges from the interaction of personal and environmental factors (Baron & Byrne, 2000). Personal factors include personality, beliefs, and emotional states, while environmental factors include provocation, environmental discomfort, and role models (Anderson & Bushman, 2002). The model emphasizes the role of emotions and mood in aggression; negative emotions can increase aggression, whereas positive emotions can reduce it (Averill, 2012; Izard, 2013). Thus, GAM conceptualizes aggression as a dynamic process shaped by the interplay of these factors.

The concept of *empathy* is widely accepted as having a significant impact on people's moral behavior and as one of the factors contributing to the tendency to help (Mehrabian & Epstein, 1972). Developing empathy skills for humans could also indirectly increase empathy for animals and other living creatures (Thompson & Gullone, 2003). Therefore, it is suggested that people with high empathy skills could empathize not only with humans but also with animals (Paul, 2000). Studies have found that individuals with high empathy for animals tend to be less violent (Lucia & Killias, 2011). In addition, research has shown that the empathic bond established with animals plays an important role in reducing violence towards animals (Plous, 1991). The research was initiated based on these findings.

### **The Importance of Research**

When current studies are examined, studies that reveal the social, cultural, and psychological aspects of violence have been added to the literature (Kocacık, 2001). However, no study has been found that suggests that individuals' empathy levels towards animals may be related to violence-predictive factors.

Examining the relationship between factors that predispose adults to violence and their level of empathy towards animals will contribute to understanding individuals' personality development, moral decision-making processes, and social relationships. The findings of the study have the potential to offer new perspectives on the perception of violence at both individual and societal levels. In particular, the findings will pave the way for the development of empathy-focused education programs and social awareness projects. These programs will contribute significantly to the creation of strategies to prevent violence by increasing social sensitivity and addressing the root causes of violence. It is also predicted that understanding the interactions among religious and cultural beliefs, fears of stray animals, the desire to own

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animals, and the collection of stray animals with violence-predictive characteristics will provide important guidance for the formulation of social policies.

### The Purpose of the Research

This research aims to examine the relationship between factors that precede violence in adults and their level of empathy towards animals. The research was designed within the quantitative paradigm (Akarsu & Akarsu, 2019, p. 8). Quantitative studies typically use three types of research questions (RQs). In an experiment or group comparison, the researcher may compare groups on an independent variable to observe how it affects a dependent variable. In a survey project, the researcher could link one or more predictor factors to one or more outcome variables. RQs could be descriptive questions that aim to describe a single variable. Alternatively, RQs could state relationship questions among variables (Creswell & Creswell, 2023, pp. 175-6). For this purpose, the answers to the following questions were investigated:

RQ1: What are the factors that precede violence in adults?

RQ2: What are the levels of empathy towards animals in adults?

RQ3: Do the factors that precede violence in adults and their levels of empathy towards animals differ significantly according to sociodemographic variables?

RQ4: Is there a significant correlation between the factors that precede violence and the level of empathy towards animals?

The main hypotheses of the current study could be conceptualized as follows:

H<sub>1</sub>: There is a significant positive correlation between the factors that precede violence in adults and their level of empathy towards animals.

H<sub>0</sub>: There is no significant relationship between the factors that predict violence in adults and their level of empathy towards animals.

## METHOD

### The Model of the Research

The research model employed is the survey model, which *aims to determine a situation that existed in the past or currently as it is* (Karasar, 2018, p. 109). In the study, one of the scanning models, called the relational scanning model under the general scanning heading, was used. This model aims to determine whether and to what degree two or more variables differ. This model is presented as a set of data pairs, allowing for relational analysis (Karasar, 2018, p. 114).

In this research model, two important variables were identified: the Violence Precursor Factors variable as the independent variable and the Empathy for Animals variable as the dependent variable. The aim was to determine whether and to what extent these variables differ.

### **Data Collection Tools**

The data for the research were collected using three instruments: the *Personal Information Form*, the *Violence Precursor Factors Scale*, and the *Animal Empathy Scale Short-Form*. The data collection tools were delivered to the participants via Google Forms.

### **Socio-Demographic Information Form**

The researchers prepared the socio-demographic information form to determine the participants' socio-demographic characteristics and attitudes towards animals. The form includes seven closed-ended questions. In the form, participants were asked whether their sex, age group, religious or cultural beliefs affected their attitudes towards animals, whether they felt fear towards stray animals, street cat and stray dog adoption requests, whether they considered it correct to collect stray cats and stray dogs, and whether they considered it correct to euthanize stray cats and stray dogs.

### **Violence Precursor Factors Scale**

The scale was developed by Erk (2023). The scale consists of 9 items and 2 sub-dimensions. The sub-dimensions of the scale are as follows: Environmental Factors (items 1-4), and Family Factors (items 5-9). The scale's applicable age range is wide and could be used with individuals over 18. The scale is a 3-point Likert-type scale, with 1-“*I Disagree*”, 2-“*I Neither Agree nor Disagree*”, and 3-“*I Agree*”. The score on the scale ranges from 9 to 27. The items belonging to each sub-dimension are added together to obtain the score for that sub-dimension. There are no items that are coded in reverse on the scale. Cronbach's Alpha internal consistency coefficients were examined to assess the scale's reliability. The Family Factors sub-dimension was found to be .84, the Environmental Factors sub-dimension was found to be .80, and the scale total items were found to be .84 (reference must be added here). In this study, Cronbach's alpha coefficients were .71 for the Familial Factors subscale, .78 for the Environmental Factors subscale, and .75 for the overall scale. A Cronbach's alpha between 0.6 and 0.7 is generally considered an adequate level of reliability. Therefore, the data obtained from the scale can be considered reliable in its current form.

### **The Animal Empathy Scale Short-Form**

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The scale was developed by Paul (2000), and its Turkish adaptation, the short form, was validated and found to be reliable by Okutan (2023). The scale has a wide age range and could be applied to adults aged 18 and above. The Empathy for Animals Scale Short-Form consists of 8 items and 2 subscales: Empathetic Emotions Factor (items 7, 10, 13, 18) and Non-Empathetic Emotions Factor (items 8, 14, 16, 19). The scale was prepared as a 9-point Likert-type, 1-“I Disagree Completely”, 9-“I Agree”. Scoring is based on the total score. The 8th, 14th, 16th, and 19th statements on the scale are scored in reverse. High scores indicate a high level of empathy towards animals in need. When the McDonald omega coefficients are examined, they are .71 for the Empathetic Emotions Factor and .75 for the entire short form. In this study, when the Cronbach alpha values were measured for the reliability of the scale, .64, .79 for the Non-Empathetic Emotions Factor, and .73 for the entire short form.

### Ethics of the Study

The research was initiated after obtaining ethical approval from the Scientific Research and Publication Ethics Committee, with reference number 2024/08-02 dated August 5, 2024. The research was conducted in the Spring term of 2024-2025.

### Analysis

In the analysis of the research results, the data collected from the forms and scales were digitized and entered into SPSS 27 for Windows. According to George and Mallery (2010), when the kurtosis and skewness values are between -2 and +2, it is assumed that the variables are normally distributed. The kurtosis and skewness values of the scales used in this study were found to be between -2 and +2, indicating normal distribution (See Table 2). Therefore, parametric test methods were used in the study. Significance levels of  $p < .05$  and  $p < .001$  are preferred.

### Sampling

To determine the sampling method, the *simple random sampling* technique—a sampling strategy in which each member of the study population has an equal chance of being selected—was used. For the sample size, a 430-person sample was determined by calculating a 90% confidence interval for each sample group and a 4% margin of error in the unknown universe.

An online platform, Google Forms, was used to collect the research data. The demographic characteristics of the sample are presented in Table 1.

**Table 1.** Personal Information Form Frequency Analysis (N=430)

Variables		n	%
Sex	Woman	284	<b>66.05</b>
	Man	146	33.95
Age Groups	18-34	229	<b>53.72</b>
	35-50	162	37.67
	51-69	39	8.61
Do your religious or cultural beliefs influence your attitude toward animals?	Yes	329	<b>76.51</b>
	No	101	23.49
Are you afraid of stray animals?	Afraid	243	<b>56.63</b>
	Not afraid	187	43.37
Would you like to adopt a stray cat?	Yes	164	38.14
	No	266	<b>61.86</b>
Do you think it is right to collect stray cats?	Yes	73	16.98
	No	357	<b>83.02</b>
Do you think it is right to euthanize stray cats?	Yes	22	5.12
	No	408	<b>94.88</b>
Would you like to adopt a stray dog?	Want	74	17.21
	Do not want	356	<b>82.79</b>
Do you think it is right to collect stray dogs?	Yes	302	<b>70.47</b>
	No	128	29.53
Do you think it is right to euthanize stray dogs?	Yes	125	29.07
	No	305	<b>70.93</b>

## FINDINGS

In this section, the descriptive analysis results, comparison results, and correlation analysis results for the *Violence Precursor Factors Scale* and the *Animal Empathy Scale Short-Form* are presented.

### Descriptive Analyses

Descriptive analyses were made regarding the sub-dimensions of the *Violence Precursor Factors (VPFS)* and the *Animal Empathy Scale Short-Form (AES-SF)* scales. When the sub-dimensions of the VPFS were examined, the *Environmental Factors* dimension ( $1.50 \pm 0.55$ ) was found to be dominant among the violence-precursor factors among adults living in Türkiye. This shows that the violent tendencies of adults living in Türkiye are more influenced by their

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social environment. At the same time, the *Family Factors* ( $1.18 \pm 0.31$ ) dimension of the VPFS scale was less pronounced in this group of participants, indicating that attitudes and behaviors related to violence were less accepted within the family.

When the sub-dimensions of the AES-SF were examined, it was found that adult individuals living in Türkiye showed dominance in the *Empathetic Emotions Factor* sub-dimension ( $8.25 \pm 1.09$ ). In other words, it was seen that adult individuals living in Türkiye had a high level of empathy towards animals. At the same time, the sub-dimension of *Non-Empathetic Emotions Factor* remained in the background ( $6.44 \pm 2.31$ ), meaning that people's insensitive attitudes and behaviors towards animals were less accepted.

### Comparison Analyses

In this section, the results of the independent-samples t-test and the one-way analysis of variance will be presented.

#### Independent Sample T-Test Analysis

An independent-samples T-test was conducted to determine whether there were sex differences in the sub-dimensions of the VPFS. The results are presented in Table 2.

**Table 2.** Sex-Based T-test Analysis

Scales & Subscales	Female		Male		<i>t</i>	<i>p</i>
	$\bar{X}$	<i>Sd</i>	$\bar{X}$	<i>Sd</i>		
<b>Violence Precursor Factors Scale</b>						
Environmental Factors	1.42	.48	<b>1.64</b>	.64	-3.645	.001*
Familial Factors	1.11	.25	<b>1.30</b>	.37	-5.410	.001*
<b>The Empathy Scale for Animals</b>						
The Factor of Empathetic Emotions	<b>8.42</b>	.92	7.92	1.30	4.158	.001*
Non-empathetic Emotion Factors	4.31	2.77	<b>4.83</b>	2.46	-2.004	.046*

\* $p < .05$  Sd: Standard Deviation

According to these results, there is a significant difference between the participants in the *Environmental Factors* sub-dimension of the VPFS based on sex,  $t(233.678) = -3.645$ ,  $p < .05$ . Men ( $1.64 \pm .64$ ) had significantly higher environmental factors that precede violence than women ( $1.42 \pm .48$ ). There is a significant difference between the participants in the *Family Factors* sub-dimension of the VPFS based on sex,  $t(216.564) = -5.410$ ,  $p < .05$ . Men ( $1.30 \pm .37$ ) have significantly higher levels of violent antecedent family factors than women ( $1.11 \pm .25$ ).

There is a significant difference between the sexes in the *Empathetic Emotions Factor* sub-dimension of the AES-SF(  $t(223.185) = 4.158, p < .05$ ). Women ( $8.42 \pm 0.92$ ) have significantly higher empathic emotions towards animals than men ( $7.92 \pm 1.30$ ). There is also a significant sex difference between participants in the *Non-Empathic Emotions Factor* subscale of the AES-SF ( $t(326.058) = -2.004, p < .05$ ). Men ( $4.83 \pm 2.45$ ) had significantly higher non-empathic emotional factors towards animals than women ( $4.31 \pm 2.77$ ).

An independent-samples T-test was also conducted to determine whether participants' views on the sub-dimensions of the VPFS differed based on their *religious or cultural beliefs and their attitudes towards animals*. According to these results, there is no significant difference between participants in the *Environmental Factors* and *Family Factors* sub-dimensions of the VPFS scale in their views, based on religious or cultural beliefs, regarding their attitudes towards animals. There is no significant difference between participants in the *Empathetic Emotions Factor* and *Non-Empathetic Emotions Factor* sub-dimensions of the AES-SF in their views on their religious or cultural beliefs, based on their attitudes towards animals.

An independent-samples T-test was conducted to determine whether participants differed in their opinions *about fear of stray animals* across the VPFS sub-dimensions. The results are presented in Table 3.

**Table 3.** Are You Afraid of Stray Animals?

Scales & Subscales	Afraid		Not afraid		<i>t</i>	<i>p</i>
	$\bar{X}$	<i>Sd</i>	$\bar{X}$	<i>Sd</i>		
<b>The Empathy Scale for Animals</b>						
The Factor of Empathetic Emotions	8.14	1.13	<b>8.39</b>	1.03	-2.301	.022*
The Factor of Non-Empathic Emotions	4.71	2.59	4.20	2.77	1.941	.053

\* $p < .05$

According to these results, there is no significant difference between participants on the *Environmental Factors* and *Family Factors* subscales of the VPFS regarding whether they are afraid of stray animals.

According to the results of the independent samples t-test analysis conducted to determine whether there are differences in their opinions about whether they are afraid of stray animals across the subscales of the AES-SF, there is a significant difference between participants in the *Empathic Emotions Factor* subscale in their opinions about whether they are afraid of stray animals ( $t(428) = -2.301, p < 0.05$ ). Participants who stated that they are not afraid of stray animals ( $8.39 \pm 1.03$ ) have significantly higher empathic emotions toward animals than

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participants who stated that they are afraid ( $8.14 \pm 1.13$ ). There is no significant difference between participants in the *Non-Empathic Emotions Factor* subscale of the AES-SF scale in their opinions about whether they are afraid of stray animals.

An independent-samples T-test was conducted to determine whether participants' *opinions differed based on whether they would adopt a stray cat*, within the sub-dimensions of the VPFS. The results are presented in Table 4.

**Table 4.** Would You Like to Adopt a Stray Cat?

Scales & Subscales	Yes		No		<i>t</i>	<i>p</i>
	$\bar{X}$	<i>Sd</i>	$\bar{X}$	<i>Sd</i>		
<b>The Empathy Scale for Animals</b>						
The Factor of Empathetic Emotions	<b>8.47</b>	0.92	8.12	1.16	3.471	.001*
The Factor of Non-Empathic Emotions	4.09	3.04	<b>4.73</b>	2.40	-2.299	.022*

\* $p < .05$

According to these results, there is no significant difference in participants' opinions on the *Environmental Factors* and *Family Factors* subscales of the VPFS regarding their willingness to adopt a stray cat.

According to the results of the independent samples t-test analysis conducted on the subscales of the AES-SF scale, there is a significant difference in the opinions of participants in the *Empathic Emotions Factor* subscale of the AES-SF scale regarding their willingness to adopt a stray cat ( $t(40.918) = 3.471, p < .05$ ). Participants who expressed a desire to adopt a stray cat ( $8.47 \pm 0.92$ ) exhibited significantly higher empathic emotions toward animals compared to those who did not ( $8.12 \pm 1.16$ ). There is a significant difference in the opinions of participants in the *Non-Empathic Emotions Factor* sub-dimension of the AES-SF scale based on whether they would like to adopt a stray cat ( $t(286.628) = -2.299, p < .05$ ). Those who said they would not like to adopt a stray cat ( $4.73 \pm 0.2.40$ ) had significantly higher levels of non-empathic emotions towards animals than those who said they would like to ( $4.09 \pm 0.3.04$ ).

An independent-samples T-test was conducted to determine whether participants' opinions differed depending on whether they considered the rounding up of stray cats to be right, within the sub-dimensions of the VPFS. The results are presented in Table 5.

**Table 5:** Do You Think It Is Right to Collect Stray Cats?

Scales & Subscales	Yes		No		<i>t</i>	<i>p</i>
<b>Violence Precursor Factors Scale</b>	$\bar{X}$	<i>Sd</i>	$\bar{X}$	<i>Sd</i>		
Environmental Factors	1.53	0.58	1.49	0.54	.608	.544
Familial Factors	<b>1.31</b>	0.40	1.15	0.28	3.192	.002*
<b>The Empathy Scale for Animals</b>						
The Factor of Empathetic Emotions	7.84	1.20	<b>8.33</b>	1.05	-3.259	.002*
The Factor of Non-Empathetic Emotions	<b>5.31</b>	2.31	4.32	2.72	3.227	.002*

\* $p < .05$ 

According to these results, there is no significant difference between participants in the *Environmental Factors* subscale of the VPFS. There is a significant difference between participants in the *Family Factors* subscale of the VPFS in terms of whether they find the roundup of stray cats justified ( $t(87.837) = 3.192, p < .05$ ). Participants who answered yes to this question ( $1.31 \pm 0.40$ ) had significantly higher levels of family factors that predispose to violence than those who answered no ( $1.15 \pm 0.28$ ).

There is a significant difference between participants in the *Empathic Emotions Factor* subscale of the AES-SF in terms of whether they find the roundup of stray cats justified ( $t(95.982) = -3.259, p < .05$ ). Participants who answered *no* to the question: “Do you think it is right to round up stray cats?” ( $8.33 \pm 0.1.05$ ) had significantly higher levels of empathy toward animals than participants who answered “yes” ( $7.84 \pm 0.1.20$ ). There was also a significant difference among participants on the *Non-Empathic Emotions Factor* subscale of the AES-SF scale based on their opinions about whether they thought it was right to round up stray cats ( $t(116.607) = 3.227, p < .05$ ). Participants who answered “yes” to this question ( $5.31 \pm 2.31$ ) had significantly higher levels of empathy toward animals than those who answered “no” ( $4.32 \pm 2.72$ ).

An independent-samples T-test was performed to determine whether there were differences in the sub-dimensions of the VPFS based on participants' views on euthanizing stray cats. The results are presented in Table 6.

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**Table 6.** Do You Think It Is Right to Euthanize Street Cats?

Scales&Subscales	Yes		No		<i>t</i>	<i>p</i>
<b>Violence Precursor Factors Scale</b>	$\bar{X}$	<i>Sd</i>	$\bar{X}$	<i>Sd</i>		
Environmental Factors	1.72	0.60	1.48	0.54	1.967	.050
Family Factors	<b>1.40</b>	0.42	1.17	0.30	2.611	.016*
<b>Empathy for Animals Scale</b>						
Empathic Emotions Factor	7.54	1.39	<b>8.29</b>	1.06	-2.478	.021*
Non-Empathic Emotions Factor	<b>5.96</b>	2.19	4.41	2.68	2.663	.008*

\* $p < .05$

According to these results, there was no significant difference in participants' opinions on the *Environmental Factors* subscale of the VPFS regarding euthanasia of stray cats. There was a significant difference in the opinions of participants in the *Family Factors* subscale of the VPFS regarding the euthanasia of stray cats, ( $t(22.215) = 2.611, p < .05$ ). Participants who answered “yes” ( $1.40 \pm 0.42$ ) had significantly higher levels of family factors that predispose to violence than those who answered “no” ( $1.17 \pm 0.30$ ).

There was a significant difference in the opinions of participants in the *Empathic Emotions Factor* subscale of the AES-SF regarding euthanasia of stray cats ( $t(22.342) = -2.478, p < .05$ ). Participants who answered “no” to the question: “Do you think it is right to euthanize stray cats?” ( $8.29 \pm 1.06$ ) had significantly higher empathic emotions toward animals than participants who answered “yes” ( $7.54 \pm 1.39$ ). There was also a significant difference in participants' views on the *Factor of Non-Empathic Emotions* subscale of the AES-SF regarding euthanasia of stray cats ( $t(428) = 2.663, p < .05$ ). Participants who answered “yes” ( $5.96 \pm 0.2.19$ ) had significantly higher fear toward animals than those who answered “no” ( $4.41 \pm 2.68$ ).

An independent-samples T-test was conducted to determine whether participants' sub-dimension scores on the VPFS differed regarding their views on stray dog adoption. The results are presented in Table 7.

**Table 7.** Would You Like to Adopt a Stray Dog?

Scales & Subscales	Want		Do not want		<i>t</i>	<i>p</i>
<b>The Empathy Scale for Animals</b>	$\bar{X}$	<i>Sd</i>	$\bar{X}$	<i>Sd</i>		
The Factor of Empathetic Emotions	<b>8.54</b>	0.83	8.19	1.13	3.006	.003
The Factor of Non-Empathetic Emotions	3.41	2.93	<b>4.71</b>	2.57	-3.533	.001*

\* $p < .05$ 

According to these results, there is no significant difference in participants' opinions on the *Environmental Factors* and *Family Factors* subscales of the VPFS regarding their willingness to adopt a stray dog.

There is a significant difference in the opinions of participants in the *Empathic Emotions Factor* subscale of the AES-SF regarding their willingness to adopt a stray dog ( $t(134.707) = 3.006$ ,  $p < .05$ ). Participants who said they would like to adopt a stray dog ( $8.54 \pm 8.19$ ) had significantly higher empathic emotions toward animals than participants who said they would not ( $8.19 \pm 1.13$ ). There was also a significant difference in the opinions of participants in the *Non-Empathic Emotions Factor* subscale of the AES-SF regarding their willingness to adopt a stray dog ( $t(97.845) = -3.533$ ,  $p < .05$ ). Participants who stated they would not like it ( $4.71 \pm 2.57$ ) exhibited significantly higher non-empathic emotions towards animals than those who stated they would like it ( $3.41 \pm 2.93$ ).

An independent-samples T-test was performed to determine whether participants' *views on the collection of stray dogs* differed across the VPFS sub-dimensions. The results are presented in Table 8.

**Table 8.** Do You Think It is Right to Round Up Stray Dogs?

Scales & Subscales	Yes		No		<i>t</i>	<i>p</i>
<b>Violence Precursor Factors Scale</b>	$\bar{X}$	<i>Sd</i>	$\bar{X}$	<i>Sd</i>		
Environmental Factors	1.53	0.56	1.43	0.51	1.712	.088
Familial Factors	<b>1.21</b>	0.34	1.10	0.23	3.790	.001*
<b>The Empathy Scale for Animals</b>						
The Factor of Empathetic Emotions	8.07	1.19	<b>8.68</b>	0.64	-6.889	.001*
The Factor of Non-Empathetic Emotions	<b>4.77</b>	2.50	3.81	2.96	3.219	.001*

\* $p < .05$ 

According to these results, there is no significant difference in participants' opinions on the *Environmental Factors* subscale of the VPFS regarding their willingness to adopt a stray dog.

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There is a significant difference in the opinions of participants in the *Family Factors* subscale of the VPFS regarding their willingness to adopt a stray dog ( $t(341.929) = 3.790, p < .05$ ). Participants who answered “yes” ( $1.21 \pm 0.34$ ) had significantly higher levels of family factors that predispose to violence than those who answered “no” ( $1.10 \pm 0.23$ ).

There is a significant difference in the opinions of participants in the *Empathic Emotions Factor* subscale of the AES-SF regarding the rounding up of stray dogs ( $t(402.652) = -6.889, p < .05$ ). Participants who answered “no” ( $8.68 \pm 0.64$ ) had significantly higher levels of empathic emotions toward animals than participants who answered “yes” ( $8.07 \pm 1.19$ ). There was also a significant difference in the opinions of participants on the *Factor of Non-Empathic Emotions* subscale of the AES-SF based on their willingness to adopt a stray dog ( $t(207.509) = 3.219, p < .05$ ). Participants who answered yes ( $4.77 \pm 2.50$ ) had significantly higher levels of non-empathic emotions toward animals than participants who answered “no” ( $3.81 \pm 2.96$ ).

An independent sample T-test analysis was performed to find out whether there were differences in the participants' *views on euthanizing stray dogs with euthanasia* in the sub-dimensions of the VPFS. The results are presented in Table 9.

**Table 9.** Do You Think It is Right to Euthanize Stray Dogs with Euthanasia?

Scales & Subscales	Yes		No		<i>t</i>	<i>p</i>
	$\bar{X}$	<i>Sd</i>	$\bar{X}$	<i>Sd</i>		
<b>Violence Precursor Factors Scale</b>						
Environmental Factors	<b>1.61</b>	0.61	1.45	0.52	2.438	.016*
Familial Factors	<b>1.29</b>	0.38	1.13	0.27	4.216	.001*
<b>The Empathy Scale for Animals</b>						
The Factor of Empathetic Emotions	7.91	1.24	<b>8.39</b>	0.99	-3.829	.001*
The Factor of Non-Empathic Emotions	<b>5.05</b>	2.42	4.26	2.75	2.945	.004*

\* $p < .05$

According to these results, there is a significant difference in the opinions of participants on the *Environmental Factors* subscale of the VPFS regarding the euthanasia of stray dogs ( $t(200.718) = 2.438, p < .05$ ). Participants who answered “yes” ( $1.61 \pm 0.61$ ) had significantly higher environmental factors that predispose to violence than those who answered “no” ( $1.45 \pm 0.52$ ). There is also a significant difference in the opinions of participants in the *Family Factors* subscale of the VPFS regarding the euthanasia of stray dogs ( $t(178.596) = 4.216, p < .05$ ). Participants who answered “yes” ( $1.29 \pm 0.38$ ) had significantly higher familial factors that predispose to violence than those who answered “no” ( $1.13 \pm 0.27$ ).

There was a significant difference in participants' views on the euthanasia of stray dogs among participants in the *Empathic Emotions Factor* sub-dimension of the AES-SF ( $t(192.946) = -3.829, p < .05$ ). Participants who answered “no” ( $8.39 \pm 0.99$ ) had significantly higher empathic emotions towards animals than those who answered “yes” ( $7.91 \pm 1.24$ ). There was also a significant difference in participants' views on euthanasia of stray dogs among those in the *Non-Empathic Emotions Factor* sub-dimension of the AES-SF ( $t(260.484) = 2.945, p < .05$ ). Participants who answered “yes” ( $5.05 \pm 2.42$ ) had significantly higher non-empathic emotions towards animals than those who answered “no” ( $4.26 \pm 2.75$ ).

### One-Way ANOVA

The difference in mean scores across the sub-dimensions of the VPFS by age group was examined using a one-way ANOVA. The results are shown in Table 10.

**Table 10.** ANOVA Analysis by Age Groups

Scale & Subscales	18-34		35-50		51-69		F(2,427)	$\eta^2$
<b>Violence Precursor Factors Scale</b>	$\bar{X}$	Sd	$\bar{X}$	Sd	$\bar{X}$	Sd		
Environmental Factors	1.51	0.54	1.47	0.57	1.52	0.52	.371	0.002
Family Factors	1.16	0.31	1.20	0.31	1.21	0.35	.734	0.003

According to the ANOVA analysis results, when the mean scores of the *VPFS* scale subscales were examined, the *Environmental Factors* ( $F(2,427) = 0.371, p = .691, \eta^2 = 0.002$ ) and *Family Factors* ( $F(2,427) = 0.734, p = .481, \eta^2 = 0.003$ ) subscales did not differ significantly across age groups.

Due to heterogeneity in group variances, the difference in mean scores between the AES-SF subscales across age groups was analyzed using the Brown-Forsythe test. The results are shown in Table 11.

**Table 11.** ANOVA Analysis by Age Groups

Scales & Subscales	18-34		35-50		51-69		Brown-Forsythe F
<b>Empathy Towards Animals Scale</b>	$\bar{X}$	Sd	$\bar{X}$	Sd	$\bar{X}$	Sd	
Empathic Emotions Factor	8.14	1.12	8.43	.97	8.17	1.27	3,162*
Non-Empathic Emotions Factor	4.23	2.78	4.66	2.53	5.28	2.52	6,144*

According to the analysis results, the *Empathic Emotions Factor* sub-dimension of the AES-SF showed a significant difference across participants' age groups, as indicated by the Brown-Forsythe  $F(2, 115.846) = 3.162, p = .046$ . Similarly, the *Non-Empathic Emotions Factor* sub-

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dimension of the scale showed a significant difference across participants' age groups, Brown-Forsythe  $F(2, 172.982) = 6.144, p = .040$ .

To examine the groups between which these differences observed in the sub-dimensions of the scale occurred and the direction of the differentiation, a post-hoc test, Tamhane's T2 analysis, was conducted. There was a significant difference in Empathic Emotions Factor scores between those aged 18-34 and those aged 35-50 ( $p = .019, p < .05$ ); specifically, those aged 35-50 had higher Empathic Emotions Factor scores.

To examine the groups between which these differences in the Non-Empathic Emotions Factor sub-dimension of the scale occurred and the direction of the differentiation, a post hoc LSD analysis was conducted. There was a significant difference in Non-Empathic Emotions Factor scores between those aged 18-34 and those aged 51-69 ( $p = .024, p < 0.05$ ); those aged 51-69 had higher scores.

### Correlation analysis

Pearson correlation analysis was conducted to assess the correlational relationship between the VPFS and the AES-SF. The results are shown in Table 12.

**Table 12.** Pearson Correlation Analysis

Scales & Subscales		VPFS <sup>a</sup>		AES-SF <sup>b</sup>	
		1	2	3	4
VPFS <sup>a</sup>	<sup>1</sup> Environmental Factors	-	.284*	-.054	.069
	<sup>2</sup> Family Factors	.284*	-	-.235*	.151*
AES-SF <sup>b</sup>	<sup>3</sup> Empathic Emotions Factor	-.054	-.235*	-	-.131*
	<sup>4</sup> Non-Empathic Emotions Factor	.069	.151*	-.131*	-

$p < .05, ^a N=430, ^b N = 430$

VPFS = Violence Precursor Factors Scale, AES-SF = Animal Empathy Scale

A significant, weak, and positive linear correlation was found between environmental factors and familial factors ( $r(428) = .284, p < .05$ ). A significant, weak and negative linear correlational relationship was found between familial factors and empathic emotions factor ( $r(428) = -.235, p < .05$ ). Again, a significant, weak and positive correlational relationship was found between familial factors and non-empathic emotions factors ( $r(428) = .151, p < .05$ ). Finally, a significant, weak and negative linear relationship was found between empathic emotions factor and non-empathic emotions factors ( $r(428) = -.131, p < .05$ ).

Based on a holistic evaluation of the data obtained, the key findings of the study can be outlined as follows:

1. Descriptive analyses showed that, among adults living in Türkiye, environmental influences were the most potent precursor of violent tendencies, indicating that social surroundings play a larger role than family attitudes. Family-related factors remained in the background, suggesting that violent attitudes and behaviors are less normalized or accepted within the family context.
2. In terms of animal empathy, participants demonstrated strong empathetic responses toward animals, reflecting a high capacity for emotional sensitivity and compassion. Non-empathetic or insensitive reactions) were notably lower, showing that indifference or insensitivity toward animals is not strongly endorsed in this group.
3. According to the results of a sex-based t-test, males had significantly higher scores on the Environmental and Family Factors subscales of the VPFS than females. In comparison, females had significantly higher scores on the Empathic Feelings toward animals subscale of the AES-SF, and males had significantly higher scores on the Non-Empathic Feelings Factor subscale. Furthermore, participants' religious or cultural beliefs did not differ significantly in their views across any subscale of either the VPFS or the AES-SF.
4. In the analysis of responses to the question "Are you afraid of stray animals?", participants' opinions regarding their fear of stray animals did not yield a significant difference on the Environmental Factors and Family Factors subscales of the VPFS. However, this showed a significant difference on the Empathic Feelings Factor subscale of the AES-SF: participants who reported no fear had significantly higher empathic feelings toward animals than those who reported fear. Conversely, no significant difference was found between participants' opinions regarding their fear of stray animals in the Non-Empathic Feelings Factor subscale of the AES-SF.
5. In analyzing the answers to the question "Would You Like to Adopt a Stray Cat/Dog?", the results from the two animal adoption questions showed highly similar patterns, in line with the sub-dimensions of the AES-SF. In both stray cat and stray dog conditions, participants who reported a willingness to adopt showed significantly higher Empathic Emotions Factor scores, reflecting stronger empathic emotional responses toward animals. In contrast, participants who did not wish to adopt exhibited significantly higher scores on the Non-Empathic Emotions Factor, indicating greater non-empathic emotional tendencies toward animals. Moreover, the direction of the t-values was

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consistent across both comparisons, with positive significant t-values favoring the adoption-willing groups for empathic emotions and negative significant t-values favoring the non-willing groups for non-empathic emotions, suggesting that reluctance to adopt—regardless of the animal type—is systematically associated with lower animal empathy and higher non-empathic emotional responses.

6. In the analysis of the answers given to the questions "Do You Think it is Right to Round Up Stray Cats/Dogs?", the analysis of participants' attitudes toward the collection of stray cats and the roundup of stray dogs revealed parallel findings across both scales; no significant group difference emerged in the VPFS Environmental Factors subscale, while a significant difference was observed in the VPFS Family Factors subscale for both questions, indicating that participants who supported the intervention ("yes") demonstrated higher levels of family-related violence predisposition. Similarly, on the AES-SF, the Empathic Emotions Factor differed significantly across both attitude items, indicating that participants who did not support interventions for stray cats and stray dogs reported higher levels of empathic emotions toward animals. Additionally, both questions showed significant differences in the AES-SF Non-Empathic Emotions-related subscales, demonstrating that participants who endorsed the intervention ("yes") exhibited elevated non-empathic emotional responses toward animals.
7. In the analysis of the answers given to the questions " Do You Think it is Right to Euthanize Stray Cats/Dogs with Euthanasia??", the results for both questions showed parallel patterns. Participants who supported the euthanization of stray animals demonstrated significantly higher violence-predisposing scores on the Environmental Factors subscale (VPFS) and the Family Factors subscale (VPFS) compared with those who opposed euthanasia. Similarly, across both items, participants who rejected euthanasia showed significantly higher levels of animal-related empathic affect on the Empathic Emotions Factor (AES-SF). In contrast, participants who endorsed euthanasia reported significantly higher levels of low-empathy affect toward animals on the Non-Empathic Emotions Factor (AES-SF). These shared findings suggest that individuals who justify euthanasia of stray animals tend to present stronger environmental and familial violence-risk indicators while simultaneously exhibiting lower empathic and higher non-empathic emotional responses toward animals.
8. According to the ANOVA results, the mean scores of the VPFS scale subscales did not differ significantly across age groups. Significant differences were found across

participant age groups in the Empathic Emotions Factor and Non-Empathic Emotions Factor sub-dimensions of the AES-SF scale. Post-hoc analyses showed that Empathic Emotions Factor scores were higher in the 35-50 age group than in the 18-34 age group. Additionally, Non-Empathic Emotions Factor scores were higher in the 51-69 age group than in the 18-34 age group.

9. According to the correlation findings, the analysis revealed several statistically significant but weak correlations among the variables. Environmental factors were positively associated with familial factors. Familial factors showed a negative relationship with empathic emotions, but a positive relationship with non-empathic emotions. Additionally, empathic and non-empathic emotions were negatively correlated. Although the relationships were significant, all effect sizes were small, indicating relatively weak associations.

## DISCUSSION

The findings of this research indicate that there are elements that significantly differentiate the violence-inducing factors and the levels of empathy towards animals among adult individuals living in Türkiye across various variables. First of all, the predominance of environmental factors in the VPFS indicates that individuals' violent tendencies are shaped by social and environmental factors rather than by the family. This situation is exceptionally consistent with the literature supporting the decisive role of social norms, economic conditions, media influence, and environmental stress factors on the propensity for violence (Anderson & Bushman, 2002). In line with Erk (2023), who classifies violence-precursor factors into biological–physiological, individual-psychological, and environmental domains, the present findings suggest that, within the Turkish context, environmental influences are particularly salient compared to familial dynamics. From the perspective of the General Aggression Model, which emphasizes the joint impact of person-related and situational inputs on aggressive behavior (Anderson & Bushman, 2002; Baron & Byrne, 2000), the predominance of environmental factors may reflect the cumulative effect of social norms, media content, and everyday stressors in contemporary Türkiye on individuals' appraisals and behavioral tendencies. The fact that familial factors remain more in the background reveals that focusing only on domestic dynamics may be insufficient in understanding individual violent attitudes. This also indicates that preventive efforts, which remain restricted to family-based interventions, may not be sufficient unless they are complemented by broader interventions targeting social learning contexts and community-level stressors (Erk, 2023).

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In terms of sex-based differences, it was observed that male participants had higher antecedents of violence compared to women in both environmental and familial factors. This result coincides with the existing literature on the construction of sex roles and masculinity. The fact that boys, in particular, learn and reinforce violence as an indicator of strength from an early age may be one of the possible reasons behind this difference (Connell, 2005). Social learning perspectives support this interpretation by showing that aggressive patterns can be acquired and reinforced through observation, modelling, and contingencies of reward and punishment (Cüceloğlu, 1997; Eron, 1994). In many social contexts, including Türkiye, masculine role expectations may normalize the use of aggression to assert power or resolve conflict, thereby strengthening the environmental and familial precursors of violence among men (Erk, 2023; Karanlı, 2016).

On the other hand, the fact that women show greater empathic responses towards animals than men suggests that gender norms may shape the attribution of emotions such as compassion and empathy to women (Herzog, 2007). Psychoanalytic and relational perspectives underline that early relational experiences and internalized object relations play an important role in shaping both aggressive impulses and capacities for empathy (Bjorkly, 2006; Koç, 2011; Taubner et al., 2017). These approaches may help explain why, in a socio-cultural context where caregiving and emotional responsiveness are more strongly associated with femininity, women in our sample report higher empathic responses toward animals.

The dominance of empathic emotions in empathy toward animals suggests that adults in Türkiye generally have a positive, sensitive attitude toward animals. Lower levels of non-empathetic emotions are encouraging, as they indicate that negative attitudes toward animals are not widespread in society. However, the fact that empathy levels toward animals vary across various variables suggests that these attitudes are not fixed but relatively flexible under changing conditions. For example, fear of stray animals appears to reduce empathy toward animals. This finding supports studies emphasizing the inverse relationship between fear and empathy (Serpell, 2004). It could be argued that fear overshadows empathy and weakens positive attitudes toward animals. Similarly, the desire to adopt a stray animal is positively correlated with empathic emotions. This suggests that individuals with a strong ownership tendency are more open to forming emotional bonds with animals. From a learning-theoretical standpoint, such patterns are consistent with the idea that emotional and behavioral responses toward animals are shaped by prior experiences and their consequences: frightening or painful encounters may condition avoidance and non-empathic attitudes, whereas rewarding

interactions foster approach and empathic concern (Cüceloğlu, 1997; Eron, 1994). Cognitive learning perspectives also highlight that when perceived benefits follow aggressive or negative behaviors toward animals, these behaviors can be reinforced and become more likely to recur (Karlı, 2016), whereas prosocial interactions can strengthen empathic schemas.

On the other hand, it is noteworthy that individuals who support the slaughter or euthanasia of animals have higher scores on factors that lead to violence. This finding suggests that negative attitudes toward animals generally parallel tendencies toward violence. The higher prevalence of non-empathic emotions toward animals among these individuals supports the idea that there is a continuum between violence against animals and violence against humans, while also supporting the idea that there is a distinction between violence against animals and violence against humans (Ascione, 2001). The General Aggression Model offers a framework for interpreting this continuum by proposing that situational cues (e.g., social approval of euthanasia or slaughter in specific contexts) interact with stable person factors (e.g., low dispositional empathy, high hostile cognition) to determine whether aggressive scripts are activated (Anderson & Bushman, 2002; Baron & Byrne, 2000). Moreover, group processes such as conformity to perceived norms and deindividuation in collective settings may reduce personal responsibility and facilitate the acceptance of violence toward animals, even among individuals who might not endorse such behavior in isolation (Karlı, 2016). These findings therefore support the view that attitudes and behaviors toward animals are embedded in broader socio-cultural scripts of violence and group-based norms (Erk, 2023).

The results of the correlation analysis reveal the complexity of the relationships between the sub-dimensions of the VPFS and the AES-SF. A significant, weak, and positive linear correlation has been found between environmental and familial factors, indicating that they partially influence each other. This suggests that the environmental and familial dynamics that shape an individual's violent tendencies operate in parallel. In addition, it has been revealed that violence-inducing familial factors negatively affect empathic emotion factors towards animals and positively affect non-empathic factors. This suggests that familial factors may positively or negatively shape individuals' empathetic behavior. This pattern is in line with psychoanalytic and relational accounts, which emphasize that early family relationships can either support the development of mentalization and empathy or, in the presence of trauma and hostility, strengthen aggressive defenses and externalizing behaviors (Bjorkly, 2006; Koç, 2011; Taubner et al., 2017). Although the present study did not directly measure neurobiological variables, the co-occurrence of elevated violence-precursor scores and reduced empathy toward animals is

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compatible with neurobiological models that associate dysregulation in emotion-related brain systems (such as the amygdala and medial prefrontal cortex) with heightened aggression and impaired emotional processing (Charney & Blair, 2003; Yang & Raine, 2009). Taken together, the correlations observed in our data can be interpreted, in line with Erk's (2023) multidimensional framework, as reflecting a convergence of environmental, familial, psychological, and underlying biological influences on violence-related dispositions and empathy.

When these findings are interpreted in the specific context of Türkiye, the predominance of environmental factors becomes even more important. Erk (2023) points out that environmental stressors, social norms, and media messages can substantially shape individuals' violence-related attitudes. In a social environment characterized by rapid change, dense urban living conditions, and widespread exposure to violence in traditional and social media, environmental inputs may frequently serve as situational triggers, as described by the General Aggression Model (Anderson & Bushman, 2002; Baron & Byrne, 2000). Thus, our results suggest that, in contemporary Türkiye, daily-life stressors and socio-cultural discourses may significantly influence both the development of violent tendencies and the expression of empathy toward animals. Against this background, interventions aimed at reducing violence and enhancing empathy toward animals need to address not only individual-level risk factors but also the broader social learning environments in which aggressive scripts and norms are produced and maintained (Cüceloğlu, 1997; Eron, 1994; Karlı, 2016).

As a result, this study provides important findings to decipher the relationship between attitudes towards animals and violent tendencies, but also reveals that the multidimensional dynamics affecting individuals' attitudes towards animals should be examined in greater depth. Future studies may address this relationship more comprehensively by accounting for variables such as socioeconomic status, childhood experiences with animals, and knowledge of animal rights. In particular, longitudinal designs that follow individuals across different developmental stages and social contexts would allow a more fine-grained examination of how environmental, familial, psychological, and biological factors, as conceptualized by Erk (2023), interact over time to influence both violence-precursor factors and empathy toward animals. It would also be informative to explore whether specific kinds of early experiences with animals (e.g., caring relationships versus exposure to cruelty) moderate the links between violence-precursor factors and later empathic responses, in line with psychoanalytic and social-learning perspectives (Eron, 1994; Taubner et al., 2017).

The research shows that it is necessary to consider individuals' attitudes towards animals not only in the context of personal values or emotions of compassion, but also within the framework of socio-cultural structures and social perceptions. Social norms, media discourses, environmental stressors, and legal regulations governing animals are decisive in shaping the relationships individuals establish with animals. In this context, the prevention of violence and the increase of empathy towards animals should be supported not only by individual awareness and education, but also by comprehensive policies and social-level cultural transformations. The General Aggression Model and social-learning approaches underscore that changing the contingencies, models, and norms that individuals encounter in their everyday environments is essential for sustainable reductions in violence (Anderson & Bushman, 2002; Baron & Byrne, 2000; Cüceloğlu, 1997; Eron, 1994). Consequently, educational programs, media campaigns, and community-based initiatives that promote prosocial interactions with animals and explicitly challenge aggressive scripts may contribute to reshaping the environmental inputs highlighted by our findings as especially influential in Türkiye (Erk, 2023; Karlı, 2016).

This study will make a significant contribution to fostering a general culture of compassion in society and preventing violence against animals by promoting empathy towards animals. As a result, this research will not only develop a deep understanding of the root causes of violence but also provide a scientific basis for strategies to increase empathy towards animals. In this context, the data obtained will lay the groundwork for future research and serve as an important resource for enhancing social awareness. However, in light of the theoretical perspectives outlined in the introduction, these contributions should be interpreted as an initial step toward integrating environmental, psychological and biological explanations of aggression with empirical data on attitudes toward animals, rather than as a definitive account of causality (Charney & Blair, 2003; Erk, 2023; Taubner et al., 2017; Yang & Raine, 2009). Within these boundaries, the central conclusion that can be drawn from the present study is that stronger environmental and familial violence-precursor factors are systematically associated with lower empathic and higher non-empathic attitudes toward animals among adults in Türkiye, in line with multidimensional models of aggression (Anderson & Bushman, 2002; Baron & Byrne, 2000).

It is recommended to conduct similar studies across different cultures and age groups to examine in greater depth the relationship between the violence-decertifying factors individuals possess and their empathy levels towards animals. However, it is important to conduct studies investigating the effects of animal rights and anti-violent community awareness programs and

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policies on individuals' empathy levels and violent tendencies. Finally, it would be helpful to use a mixed-methods approach, combining qualitative and quantitative methods, to examine empathy towards animals and tendencies towards violence in greater depth. The studies to be carried out in accordance with these recommendations will contribute to a more comprehensive understanding of the relationship between violence-decertifying factors and levels of empathy towards animals. They will make important contributions to the field's literature. Qualitative methods, in particular, could deepen our understanding of how individuals in Türkiye subjectively make sense of their experiences with animals, family dynamics, and social environments, thereby complementing the quantitative patterns revealed in the present study and offering richer insights into the mechanisms proposed by psychoanalytic and social-learning theories (Cüceloğlu, 1997; Karslı, 2016; Taubner et al., 2017 ).

The findings of this study were limited by a small sample size, which reduced its ability to represent a broader population. Moreover, the cross-sectional design of the research does not allow for causal inferences about the direction of the relationships between violence-precursor factors and empathy toward animals; therefore, it remains unclear whether low empathy increases violent tendencies, whether pre-existing violent dispositions erode empathy, or whether both are shaped in parallel by common underlying factors. Additionally, conducting the research within a specific geographical region and time limits the generalizability of the results. The exclusive reliance on self-report scales may also introduce social desirability and recall biases, especially for sensitive topics such as violence and attitudes toward animals. Finally, it is essential to consider that uncontrollable external factors may influence the findings. In light of these limitations, the results should be interpreted as indicating patterns of association rather than definitive causal pathways, and future studies using longitudinal and multi-method designs will be crucial for testing the robustness and directionality of the relationships observed here.

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