

Adaptation of the Dispositional Empathy with Nature Scale to Turkish: The Wolf Example

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Abstract

Empathy towards nature and wild animals is becoming increasingly important in terms of environmental protection and sustainability. Measuring empathy towards nature is very important in this context. This article presents findings regarding the validity and reliability of Dispositional Empathy with Nature (DEN) Scale, adapted into Turkish to measure empathy towards wolves, in a sample of Turkish adolescents. The research was conducted with a total of 1140 secondary school students (M=15.72; SD=0.87), 618 female, 507 male and 15 gender-unspecified, studying in public schools in Ankara. As a result of exploratory factor analyses, it was seen that the internal consistency of the scale was high, and the single-factor structure was supported as in the original DEN scale. Females were found to have higher empathy for wolves than males.

Keywords: Wild animals, wolves, empathy, high school students

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Introduction

Environmental crises, biodiversity losses, habitat destruction and excessive use of natural resources that occur frequently today are important issues that negatively affect both ecological and social well-being. For example, the extinction of many ecologically critical wild animal species leads to dramatic disruptions in essential ecosystem functions (Dirzo et al., 2014). Due to environmental concerns such as the decline of wild animal populations and the destruction of nature, researchers have turned to studies focusing on emotional variables such as empathy (Schultz, 2000; Berenguer, 2007; Ghasemi & Kyle, 2021; Sevillano et al., 2007). It is argued that empathy with nature is of critical importance in terms of re-establishing the connection that humans have lost with nature (Ives et al., 2018) and sustainability (Brown et al., 2019; Rifkin, 2009). Empathy is seen by environmental researchers as a key solution in efforts to protect nature and wildlife (Tam, 2013). This makes empathy with nature an important issue in environmental education (Schultz, 2000). The word *empathia*, which means “*feeling inside*” in Greek, was first defined by aesthetic theorists as “*the ability of an individual to perceive the emotional, intellectual and intuitive experience of another person*” (Goleman, 1998, p. 129). The concept of empathy has been defined from different perspectives since it was first introduced. In recent studies, 43 different definitions of the concept of empathy, which is still not fully conceptualized but is accepted as a multidimensional structure, have been found (Cuffs et al., 2016). Empathy, in its simplest definition, is the response of one person to the emotions or situation of another (Davis, 1983). Empathy includes cognitive and emotional abilities (Cuff et al., 2016; Hall, & Schwartz, 2019). Cognitive empathy represents the ability to understand another's emotions and adopt their perspective. Emotional empathy is the ability to share another person's feelings. Another type of emotional response, “*empathic concern*” is feeling compassionate feelings for another person who is in distress (Cuff et al., 2016; Davis, 1983; Hall, & Schwartz, 2019).

Although research has historically focused on empathy between humans, humans can also feel empathy for animals (Franklin et al., 2013; Paul, 2000; Tam, 2013; Young et al., 2018). For example, a person may understand the suffering of an injured animal, experience that pain as if he or she were experiencing it himself or herself and feel compassion for that animal. In addition, Tam (2013) introduced the concept of “*empathy with nature*,” which suggests that the human capacity for empathy extends to nature and defined it as “*the understanding and sharing of the emotional experience, particularly distress, of the natural world*” (p. 93). According to Tam (2013), people may be encouraged to empathize with nature (induced empathy) or they may have a predisposition to spontaneously empathize with nature as a personality trait (dispositional empathy). However, even if empathy for humans and non-humans (empathy for animals and nature) are related to some extent, there is evidence that these concepts are different psychological phenomena (Gómez-Leal et al., 2021; Sevillano et al., 2017; Paul, 2000; Tam, 2013; Taylor & Signal, 2005). Other studies (Geiger et al., 2017; Kim & Cooke, 2021; Walker & Chapman, 2003) have found evidence to support the idea that people can feel empathy for nature (e.g., ecosystems). Consistent with Tam's (2013) propositions, research has shown that individuals who feel empathy with specific elements of nature (e.g., animals) or with nature as a whole, whether dispositional or induced, are more likely to exhibit nature conservation behavior (Ballarotto et al., 2025; Berenguer et al., 2007; Büscher et al., 2023; Ghasemi & Kyle, 2021; Greving & Kimmerle, 2021; Kim & Cooke, 2021; Maguire et al., 2020; Smith et al., 2024; Swim, & Bloodhart, 2015; Wang et al., 2023; Yin et al., 2021). Empathy may also play an important role in decisions about animal welfare. For example, consumers who feel stronger empathy toward suffering fish report stronger moral obligations to purchase fish with better welfare (Govaerts & Altintzoglou, 2024). Additionally, recent research suggests that empathy plays a critical role in human-wildlife coexistence. For example, empathy for wildlife was associated with greater tolerance toward them (Kansky & Kidd, 2024).

The Dispositional Empathy with Nature (DEN) Scale

Tam (2013) developed DEN scale, which fills an important gap in literature as an original tool to measure individual differences in the tendency to empathize with nature. The DEN scale includes items referring to “*perspective taking*” representing cognitive empathy, and “*empathic concern*”

representing emotional empathy. Since the (DEN) scale is intended to measure empathy for distress in the natural world in general, the scale includes a short instruction that directs participants to think of specific examples of situations in which nature is distressed. Thus, the scale items are associated with a specific context. The items refer to the experiences of animals and plants to represent nature (e.g., “*I imagine how I would feel if I were the suffering animals and plants*”). Participants are asked to indicate whether they agree or disagree with the items on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The DEN scale has demonstrated a one-dimensional structure (Tam, 2013), supporting the assumption that the cognitive and emotional dimensions of empathy cannot be empirically separated (Baron-Cohen & Wheelwright, 2004). The one-dimensional structure of the scale has also been confirmed in Spanish (Sevillano et al., 2017) and Italian (Lovati et al., 2025) samples. All or some items of the DEN scale have also been used to measure empathy towards wildlife more specifically. For example, Ghasemi and Kyle (2021) measured empathy towards wildlife in their research. For this purpose, they changed the phrase “animals and plants” in the original items of the DEN scale to “wildlife”. Büscher et al. (2023) adapted items from the DEN scale to measure empathy towards “endangered animals in Ecuador”. Similarly, Govaerts and Altintzoglou (2024) measured the tendency to empathize with fish using some items from the DEN scale.

This study examined the construct validity and reliability of the DEN scale (Tam, 2013), adapted to measure empathy towards wolves, in a Turkish sample. The gray wolf (*Canis lupus*) is a native and ecologically important species found across all regions of Turkey (Ambarlı et al., 2016), including Ankara where the study was conducted. Human-wildlife conflicts (Ambarlı, 2019; Thirgood et al., 2005) due to carnivorous nature makes wolves a socially and emotionally salient species for assessing empathy. The study is important in terms of encouraging research on empathy with nature and wild animals in Turkey and testing the cross-cultural validity of the DEN scale.

Methodology

Sample and Data Collection

This research was conducted using a classical printed survey method. The data was collected between March 2024 and May 2024. The sample consisted of 1,140 high school students from different grade levels (Table 1) studying in public schools in 19 different districts of Ankara. The total sample included 618 females, 507 males, and 15 students who did not specify their gender. The students were selected using a convenience sampling method. The ages of the students ranged from 13 to 19 ($M=15.72$; $SD=0.87$).

Table 1. *Participants' Grade Levels.*

Grade Level	Total	Percentage
9	228	20
10	516	45
11	347	30
12	49	5
Total	1140	100

Students from different types of high schools participated in the study (Table 2). All schools participating in the study were state schools. The survey was conducted during class hours. Prior to the survey, students were informed about the purpose of the study, and it was emphasized that participation was entirely voluntary.

Table 2. *Types of Schools Participating in the Study.*

School Type	Total	Percentage
Anatolian High School	714	62
Anatolian Imam Hatip High School	94	8
Multi-Program Anatolian High School	42	4
Science High School	235	21
Vocational Technical and Anatolian High School	55	5
Total	1140	100

Adaptation Procedure

The original DEN scale developed by Tam (2013) consisted of 10 items. In our study, all 10 items were retained with only replacing the phrase “animals and plants” with “wolves” to measure dispositional empathy with wolves. Next, the scale items were independently translated into Turkish by three academic experts who completed their doctoral education in the field of science education in the USA and are fluent in both English and Turkish. The translated versions were then reviewed and discussed with one of the translators and the authors of this article, and a consensus was reached on the final version. A short instruction was added to provide context to the items in the scale, including examples of situations in which wolves suffer in nature. Like the original scale, participants were asked what they thought and felt when they heard such news about wolves. Participants were asked to what extent they agreed with the statements on a 5-point Likert scale instead of the original 7-point scale.

Analysis

SPSS 23 statistical program was used in the analysis of the data. The validity of the scale adapted to measure dispositional empathy towards wolves was examined using exploratory factor analysis (EFA). The reliability of the scale was examined by calculating the Cronbach's alpha coefficient and item-total correlations. The independent t-test was used to examine whether there was a difference between male and female students in terms of empathy scores towards wolves.

Results

The KMO coefficient (0.917) and Bartlett's sphericity test (Chi-Square = 6476.269; df=45; p=0.000) results showed that the data were suitable for factor analysis. As a result of the factor analysis, it was determined that all DEN scale items combined under one principal component (Table 3). The single factor explained 57% of the total variance.

Table 3. *Factor Analysis Results.*

Component Matrix^a	
Item Number	Component 1
8	,821
2	,811
9	,795
3	,794
4	,758
5	,756
1	,731
7	,711
6	,702
10	,689

Cronbach Alpha coefficient of the scale was determined as 0,917. The item total statistics are presented in Table 4. As seen from the Table Cronbach's Alpha value ranges between 0,905 and 0,913 for any deleted item. That shows that all items fit in the scale and there is no need to delete any item.

Table 4. *Item Total Statistics of DEN Scale.*

Item-Total Statistics				
Item Number	Scale Mean if Deleted	Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1	32,40	56,657	,662	,911
2	32,52	55,300	,752	,906
3	32,76	54,441	,733	,907
4	32,73	55,028	,694	,909
5	32,34	56,143	,691	,909
6	32,48	56,888	,632	,912
7	32,00	57,390	,639	,912
8	32,80	54,430	,765	,905
9	32,81	54,647	,733	,907
10	31,75	58,334	,616	,913

Skewness (-0.836) and Kurtosis (0.870) values showed that the empathy variable had a normal distribution. As shown in Table 5 independent samples t-test was conducted to compare empathy toward wolves between male and female participants, as measured by the adapted Turkish version of DEN scale.

Table 5. *Independent Sample t-test Results.*

Levene's Test t-test for Equality of Means						
	F	Sig.	t	df	Sig.	Mean Difference Std. Error Difference
Equal variances assumed	33,855	,000	8,308	1123	,000	4,063 ,489
Equal variances not assumed			8,101	936	,000	4,063 ,502

Levene's test for equality of variances was significant ($F = 33.855, p < .001$), indicating that the assumption of equal variances was violated. Therefore, results based on the "equal variances assumed" and "equal variances not assumed" rows were interpreted independently.

Table 6 displays group statistics and t-test results for gender differences in empathy toward nature (specifically wolves), using the adapted DEN scale, under the assumption of unequal variances. The analysis revealed that female participants ($N = 618, M = 37.69, SD = 7.13$) scored significantly higher on the DEN scale compared to male participants ($N = 507, M = 33.63, SD = 9.26$), $t(936) = 8.101, p < .001$. These results suggest that females show a significantly greater dispositional empathy toward wolves compared to males. Cohen's $d = 0.49$ was obtained, which is a practically significant difference indicating that the effect size is at a medium level.

Table 6. *Group Statistics for not Equal Variances Assumed.*

Gender	F	Sig.	Df	N	t	Mean	Std. Deviation
Female	33,855	0.000	936	618	8,101	37,69	7,13
Male				507		33,63	9,26

Discussion

When people's empathy orientations towards wildlife are examined, it is seen that they exhibit positive attitudes and behaviors that protect and support wildlife (Berenguer et al., 2007; Büscher et al., 2023; Ghasemi & Kyle, 2021; Greving & Kimmerle, 2021; Kansky & Kidd, 2024). The DEN scale, which was developed to measure empathy towards nature, has also been seen as a usable, effective and functional tool in assessing empathy felt towards wild animals (Büscher et al., 2023; Ghasemi & Kyle, 2021; Govaerts & Altintzoglou, 2024). However, given that culture shapes both people's empathic responses (Jami et al., 2024) and their relationships with animals (Prato-Previde et al., 2022), such scales can be expected to yield different results in different cultures. This article examines the construct validity and reliability of the DEN scale, adapted to measure empathy towards wolves, in a sample of Turkish adolescents. As a result of the exploratory factor analysis conducted on the modified items to measure empathy with wolves, a single-factor structure was obtained. Therefore, the adapted scale overlapped with the single-factor structure of Tam's (2013) original DEN scale. The analysis conducted to test reliability showed that the scale had high internal consistency. In summary, the adapted DEN scale was found to be a valid and reliable scale in assessing individual differences in the tendency to empathize with wolves in the Turkish sample. These findings confirmed the capacity of the DEN scale to measure empathy towards a specific element of nature, such as a wild animal species. However, the original DEN scale measures empathy with nature. Therefore, our findings cannot be directly generalized to the original DEN scale. The validity and reliability of the original DEN scale within a Turkish sample should be examined independently.

The findings obtained with DEN, which was adapted to Turkish and formatted specifically for wolves, proved that the empathy levels of female participants were significantly higher than those of male participants. This result is consistent with other research showing that females have stronger empathy (Paul, 2000) and moral concern (Herzog, Betchart, and Pittman, 1991; Kellert and Berry, 1987) for animals.

The fact that the sample consisted of adolescents and that the convenience sampling method was used can be expressed as a limitation of this study. Most of the sample consisted of adolescents living in the urban area. Therefore, it may be difficult to generalize our findings to the general population. However, our findings are important in terms of showing that the DEN scale has a robust factorial structure and can measure empathy towards wolves in a Turkish sample.

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Footnote: This research was carried out within the scope of a doctoral study conducted within the Hacettepe University Institute of Educational Sciences. The (DEN) scale used in the study was defined as a functional and meaningful tool in terms of measuring not only general empathy towards nature but also specific empathy felt towards wild animals. It was determined that the scale would make a significant contribution to the use of empathy-based measurement tools in the field of environmental education.

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