Attitudes Toward Animal Welfare Among Adolescents from Colombia, France, Germany, and India

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ABSTRACT

Concerns about animal welfare are becoming increasingly important. Recent research suggests that age and gender are associated with attitudes toward animal welfare in adolescents. In this study, we analyzed attitudes toward animal welfare in adolescents from five geographic regions: Colombia, France, Germany, and two regions in India (Raipur and Kalyani). Individuals responded to the Composite Respect for Animals Scale (CRAS-S). The CRAS-S score integrates 10 facets of attitudes toward animal welfare: the use of animals in research, for food, as pets, for recreation, for clothing, farm animal husbandry, and the conservation of animals, as well as emotional aspects such as feeling superior to animals or emotional affection. A total of 627 males and 506 females ($n=1,133$) participated in this study (France, 134; Colombia, 193; Germany, 377; Raipur, 210; Kalyani, 219). Females scored significantly higher than males (2.9% of variance explained). There was no consistent relationship with age. No relationship was found in Colombia, France, and Raipur, and a negative relationship in attitudes toward animal welfare was found in Germany and Kalyani.

Issues regarding animal welfare – such as using animals for food, recreational activities, or scientific research – are becoming increasingly important, at least in Western societies (see, e.g., https://ec.europa.eu/food/animals/welfare_en). Accordingly, there are big debates in the general public about how and why science, industry, and society use animals; studying attitudes toward animal welfare is a rapidly growing domain (Deemer & Lobao, 2011; Delon, 2018; Kendall et al., 2006; Ormandy & Schuppli, 2014). These issues have often been investigated regarding the attitudes of adults and the general public (Deemer & Lobao, 2011; Kendall et al., 2006; Ormandy & Schuppli, 2014).

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Less attention though has been paid to adolescents, especially outside of English-speaking countries (Binngiesser et al., 2013; Menor-Campos et al., 2018). Adolescence is an important period during which key aspects of personality, self-esteem, and attitudes are shaped (Hurlock, 1949). In addition, during this period, attitudes toward animal welfare and relationships with animals are established, for example, meat-eating habits versus vegetarianism (Jabs et al., 1998; Worsley & Skrzypiec, 1997, 1998). It is, therefore, important to assess attitudes toward animal welfare during adolescence, and the current study aimed to address this gap.

Attitudes toward animals refer to human attitudes toward animals in general (Batt, 2009; Ormandy et al., 2013; Prokop & Randler, 2018). This construct involves various concepts (Kasperbauer, 2017). First, attitudes toward animals can be examined by focusing on the appreciation of, or preference for, a given taxon: the attraction to a species versus the disgust and fear of others (Batt, 2009; Orǎžem et al., 2019; Randler et al., 2020). Abundant research, especially in the field of biology education, has been devoted to this topic (Binngiesser & Randler, 2015; Prokop & Randler, 2018; Tomažič, 2011; Tomažič et al., 2020; Wagler & Wagler, 2011).

Attitudes toward the use of animals ("Attitudes toward animal welfare"), however, focus more specifically on the use of animals in farming, for food, and other products, or on the use of animals for companionship (pets) and of animals in scientific research (Delon, 2018; Herzog et al., 1991; Ormandy et al., 2013; Randler et al., 2019). The latter two are components of “belief in animal mind” (Knight et al., 2004), which is a slightly different construct but is also strongly related to attitudes toward animals. Usually, research about attitudes toward animal welfare is less oriented toward a specific taxon and has revealed that several factors, such as age and gender, can play an important role in their development (Ormandy et al., 2013).

**Age**

Age has been identified as one factor associated with attitudes toward animal welfare in children and adolescents (Eagles & Muffit, 1990; Kellert, 1985; Pagani et al., 2007; Stanisstreet et al., 1993). In general, attitudes toward animal welfare seem to be higher (i.e., more positive toward animals, and more negative about the use of animals) in younger age groups compared with older ones. However, the findings are mixed. For example, Stanisstreet et al. (1993) reported that younger pupils gave more "sympathetic" responses to some statements about the use of animals than older pupils, suggesting that younger children are more sensitive than older ones (p. 419). However, comparing responses from children and adolescents from Grade 2 to Grade 11, Kellert (1985) found the opposite: younger children expressed minimal concern for the rights and protection of animals compared with older ones. An Italian survey administered to pupils aged 9–18 years reported that young individuals (9–10 years) were more often against hunting and opposed the use of animals in zoos, circuses, or for fur and the leather industry than older ones (Pagani et al., 2007). In Germany, positive attitudes toward animal welfare were significantly higher in Grade 5 than in Grade 11 (Binngiesser et al., 2013). However, a recent study did not show differences in these attitudes in adolescents.
(Martens et al., 2019), which leads to the question of whether age differences have a developmental basis or are a result of a cohort effect.

**Gender**

Attitudes toward animal welfare usually differ between genders (Herzog, 2007), in that females express higher pro-animal attitudes (e.g., Apostol et al., 2013; Herzog et al., 1991; Kellert & Berry, 1987; Martens et al., 2019; Mazas et al., 2013; Pagani et al., 2007; Pifer et al., 1994; Stanisstreet et al., 1993). Kellert and Berry (1987) reported gender differences in almost every dimension of attitudes toward animals and concluded that “gender is among the most important demographic factors in determining attitudes about animals in our society” (p. 370). However, no differences in attitude scores between males and females were found by Eagles and Muffit (1990). Herzog et al. (1991) suggest that gender differences may develop during or even before adolescence. Phillips et al. (2011), however, suggest that gender differences are greater in countries with higher gender empowerment. Therefore, exploring gender differences, especially in adolescence and in different countries, is an important issue.

**Other Predictors of Attitudes Toward Animal Welfare**

Various other factors can influence the attitudes toward animal welfare. For example, “belief in animal mind” and vegetarianism are related to attitudes toward animal welfare and correlation coefficients range, respectively, from 0.46 to 0.53 and from 0.22 to 0.39 (Knight et al., 2004). Belief in animal mind is higher in animal welfarists than in scientists, while laypersons occupy an intermediate position (Knight et al., 2009). Ellingsen et al. (2010) reported a strong, positive correlation (0.58) between animal-directed empathy and positive attitudes toward pets. Furthermore, Wilkins et al. (2015) showed that belief in animal mind was the most important statistical predictor of emotion attribution to animals, that is, whether a person is likely to attribute emotions to animals. However, these authors provided a cautionary note, saying that the varied results might be due to both measures being part of the same underlying construct (Wilkins et al., 2015). At the same time, congruence between two questionnaires can also be interpreted as convergent validity. Another individual difference trait was “perception of choice.” This is when respondents judge that there are alternatives to animal use (Knight et al., 2009). This construct also showed a strong correlation with pro-animal attitudes and accounted for 40% of the variance in attitudes (Knight et al., 2009). Meat consumption is negatively correlated with attitudes toward animal welfare (Binngiesser et al., 2013; Randler et al., 2019) and vegetarians generally express greater concerns for animal welfare (Cooper et al., 1985; Furnham et al., 2003; Herzog & Golden, 2009; Martens et al., 2019; Santos & Booth, 1996). Pet owners express higher pro-animal attitudes than other people (Prokop & Tunnicliffe, 2010; Randler et al., 2019; Signal & Taylor, 2006). They also attribute more emotions to animals, especially their own pets (Morris et al., 2012). Herzog and Mathews (1997) revealed a correlation between two personality factors (sensitivity and imaginativeness) and attitudes toward animal welfare, and Randler et al. (2019)
found three out of the Big Five personality domains (agreeableness, conscientiousness, and openness) to be positively related to attitudes toward animal welfare.

**Current Study**

The current study was designed to assess attitudes toward animal welfare in adolescents across different nations from three continents. We chose to study countries that differ in human development and socioeconomic factors (Hummel et al., 2015), and so we used the developmental categories of the Human Development Index (HDI). The HDI (2014) provides a ranking of countries from 1 to 187, with 1 being the most developed country (i.e., Norway) and 187 the least (i.e., Nigeria). The HDI spectrum of our selected countries was wide, ranging from 6 (Germany), 20 (France), 98 (Colombia), to 135 (India). The HDI further classifies countries into four groups: those with the highest development, high development, medium development, and low development. We aimed to gather data from countries from each of those four groups. Germany and France are in the highest development group, Colombia is in the high development group, and India is in the medium developed group. We attempted to collect data from additional countries (e.g., with low development), but we were not successful. Other recent studies have focused on countries with comparable socioeconomic status to those we used (e.g., by Cembalo et al., 2016); thus, our study provides additional insight. Using large samples enabled us to study the effects of age and gender in greater detail. We aimed to address the following research question: What is the relationship between age and gender and attitudes toward animal welfare in adolescents in countries that differ in economic development? It is important to note that our study is unique, as it takes into account different stages of economic development and focuses on adolescent populations, which has not been previously studied in a comparative manner (e.g., Martens et al., 2019).

**Methods**

**Instrument: Composite Respect for Animals Scale-Short Version (CRAS-S)**

We used a questionnaire previously established and tested by Randler et al. (2019). It provides a 20-item scale to measure respondents’ attitudes toward animal welfare. Initially, Binngiesser et al. (2013) translated seven scales from English into German and tested them on school students (for details, see Binngiesser et al., 2013). That study included more than 100 questions, which was deemed too lengthy. Randler et al. (2019) then reduced the number of items and shortened the scale down to a 20-item measure, which was labeled Composite Respect for Animals Scale-Short ([CRAS-S]; Randler et al., 2019; Appendix 1). As all the original items were already available in English, we used the English items for translation into other languages (French, Spanish, and Hindi). All translations were done through parallel translations, with subsequent refining of the wording using the reconciliation procedure (consensus revision; Harkness & Schoua-Glusberg, 1998). Further details are provided below. A back translation was applied in Colombia with the Spanish version of the survey.
We followed the suggestion that standardization of questionnaires administered over large spatial scales is needed to accurately assess children’s attitudes (Ballouard et al., 2015). The questionnaire contains 20 items with a 5-point Likert-type response format (fully agree to fully disagree, plus an “undecided” response option). Seven of the 20 items are reverse coded. The total score is the mean score of responses to all items. Higher scores on the CRAS-S reflect higher pro-animal attitudes. The questionnaire contains 10 different aspects of attitudes toward animal welfare – each covered by two questions (for an equal and balanced content) – and the questionnaire is used applying a one-dimensional construct with one total score, so the total score is calculated by summing up the items after recoding the reversed ones. The aspects covered are (1) use of animals in research, (2) use of animals for food, (3) farm animal husbandry, (4) animals as pets, (5) animal use for recreation, (6) humans as superior, (7) conservation of animals, (8) animal use for clothing, (9) hunting/angling, and (10) commitment (emotional affection). Because of cultural issues, we changed one item from the original scale: “raise cattle and hens for food” was changed to “raise animals for food.” This was because cattle/cows are holy animals in India, and eating their meat is taboo; therefore, we used the term “animals” instead.

**General Procedure**

Ethical approval was issued by the University of Education Heidelberg, Ethics Committee (#7741.35-13) in Germany, and this criterion was generally applied to all other countries. Additionally, clearance was given by the Institutional Ethics Committee of Pt. Ravishankar Shukla University, Raipur, India (IEC Ref. No.: 036/IEC/PRSU/2014).

All collaborators/authors were asked to administer an anonymous survey to 200 school pupils in each location, with the aim to sample an equal number of males and females (following the method applied by Schmitt et al., 2008). Most samples fulfilled these requirements (Table 1). We collected data from four countries and three continents (five languages and cultures): Colombia, France, Germany, and India (collected in two different languages, Hindi and English, in two different regions). The age of the adolescents ranged from 13 to 18 years in all samples, corresponding to schools from Grade 5 and higher (Table 1). Pupils attended regular schools/classes and were tested in their usual classroom setting (paper–pencil questionnaire).

**Colombia:** In Colombia, data were gathered from a state school in Bucaramanga. This city, the 5th largest in the South American country, is located in the north-western region of Colombia, and the school provides education for a student population from lower and

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**Table 1.** Descriptive statistics of the study samples.

<table>
<thead>
<tr>
<th></th>
<th>Males (n)</th>
<th>Females (n)</th>
<th>Total (n)</th>
<th>Mean age (years)</th>
<th>SD</th>
<th>Mean CRAS-S score</th>
<th>SD</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>61</td>
<td>73</td>
<td>134</td>
<td>14.94</td>
<td>1.53</td>
<td>3.56</td>
<td>0.51</td>
<td>0.777</td>
</tr>
<tr>
<td>Colombia</td>
<td>151</td>
<td>42</td>
<td>193</td>
<td>15.19</td>
<td>1.11</td>
<td>3.73</td>
<td>0.47</td>
<td>0.697</td>
</tr>
<tr>
<td>Germany</td>
<td>191</td>
<td>186</td>
<td>377</td>
<td>14.62</td>
<td>1.41</td>
<td>3.23</td>
<td>0.59</td>
<td>0.868</td>
</tr>
<tr>
<td>India (English)</td>
<td>94</td>
<td>125</td>
<td>219</td>
<td>16.01</td>
<td>0.97</td>
<td>3.37</td>
<td>0.48</td>
<td>0.536</td>
</tr>
<tr>
<td>India (Hindi)</td>
<td>130</td>
<td>80</td>
<td>210</td>
<td>15.88</td>
<td>0.83</td>
<td>3.71</td>
<td>0.41</td>
<td>0.558</td>
</tr>
<tr>
<td>Total</td>
<td>627</td>
<td>506</td>
<td>1133</td>
<td>15.26</td>
<td>1.34</td>
<td>3.47</td>
<td>0.55</td>
<td></td>
</tr>
</tbody>
</table>
medium socio-economic status communities. The participating students were in the middle and high school grade levels. Before the CRAS-S questionnaire was administered, it was translated from English into Spanish by the Colombian-native member of the research team who had previously worked as a science educator in the targeted school community. The cooperating science teacher in the school where the survey was administered piloted the Spanish version with a group of 10 high school students. Both the Spanish-speaking researcher and the cooperating science teacher revised the Spanish version using the initial test and reached agreement on the items that required clarification. The study was carried out in 2016.

France: The CRAS-S was translated from English to French by XB and JMB and was approved by one of the two teachers who distributed the questionnaire to the pupils. The survey was conducted in two schools in spring 2016: one situated in the southeast of France (Saint Maximin city, \( n = 2 \) school classes) and the other in center of the country (Auxerre city, \( n = 5 \) classes). Both teachers taught biology, introduced the questionnaire to the pupils as part of the curriculum, and incorporated the survey as part of a long-term project dedicated to biodiversity and the environment. This was a convenience sample as researchers had existing links to the schools involved. The study complies with French law and was approved by the respective educational academic agency of the two schools (Parents and Teachers Association).

Germany: The CRAS-S was originally developed in German (Randler et al., 2019), so a translation was not necessary for this study. The survey was conducted in spring 2013 in state schools in Leipzig. Written consent was obtained from the principal and the parents. The study complies with German law and was approved by the respective educational academic agencies of the two schools (responsible committee; Saxony Education Agency [Sächsische Bildungsagentur], which is the Saxon State Ministry for culture and sports).

East India (English version): High school students close to the University of Kalyani, West Bengal, were surveyed. The students were acquainted with English, so the English version was used. Participating students were randomly selected using a lottery procedure. Some of the students were residents, while others were day boarders. Participants completed the questionnaire in the presence of the researcher. The study was carried out in 2016. The sample comprised pupils of various religions and beliefs. Religion was not noted, but Hindu families were predominant (85%). Pupils and their parents were informed about the study protocol and objectives of the study. Informed consent was obtained from each.

Southeast India (Hindi version): The CRAS-S was translated from English to Hindi by two competent bilingual (Hindi and English) translators. The two Hindi-speaking persons translated versions of the CRAS-S in parallel, and they were compared for vocabulary congruence or possible discrepancy by the researchers. The translated version was then pretested on 10 volunteers from younger university students (freshmen), who served as additional experts. After their comments, the questionnaire was revised, with minor changes made and remaining discrepancies deleted. The final questionnaire was then approved and applied in school students. After explaining the research, consent was taken from each volunteer. The final Hindi version of the CRAS-S was distributed to the school children residing in Raipur, south-eastern India, in 2015–2016. The data sample contains schoolchildren from various religions and beliefs.
Statistical Analyses

The HDI data were extracted from the United Nations Human Developmental Report, where countries are ranked according to their development status (United Nations Development Programme, 2014). The HDI integrates economic information and measures of human development to obtain an overall score of human development. We used SPSS 24.0 (IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp) for all analyses. To test the internal consistency of the scales, we used Cronbach’s alpha. We compared the mean scores of the five different samples using a general linear model with age, gender, and location as fixed factors, and included all interactions in the analysis. As a measure of effect size, we used partial eta², which can be directly interpreted into percentages of explained variance. Independent t-tests were conducted to compare males and females, and a one-way analysis of variance was conducted to compare age groups. The significance level was set at < 0.05.

Results

Table 1 provides an overview of the sample according to gender, mean age, and mean CRAS-S score, standard deviation (SD), and Cronbach’s α ranges. Although most values were above the conventional threshold (0.7), those for the Indian groups were slightly lower (i.e., 0.536 and 0.558).

In the general linear model, country and gender were strongly associated with CRAS-S scores (Table 2). The estimated marginal means of the CRAS-S differed between countries (the uncorrected means and SD are presented in Table 1). The highest scores were obtained in Colombia (Mean [M], standard error [SE]: M = 3.82, SE = 0.064), followed by India (Hindi version: M = 3.70, SE = 0.072), France (M = 3.57, SE = 0.054), India (English version M = 3.40, SE = 0.074), and finally Germany (M = 3.17, SE = 0.033). Despite a significant interaction between country and gender (Table 2), females obtained higher mean CRAS-S scores than males, with a mean effect size of 2.9% of variance explained (Figure 1).

Considering significant interactions between country and gender, we repeated the gender analysis for each country. Females expressed higher attitudes toward animal

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Mean of squares</th>
<th>F</th>
<th>p</th>
<th>Partial eta²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected model</td>
<td>56</td>
<td>1.736</td>
<td>7.584</td>
<td>&lt; 0.001</td>
<td>0.283</td>
</tr>
<tr>
<td>Constant</td>
<td>1</td>
<td>3180.662</td>
<td>13897.133</td>
<td>&lt; 0.001</td>
<td>0.928</td>
</tr>
<tr>
<td>Country</td>
<td>4</td>
<td>6.745</td>
<td>29.473</td>
<td>&lt; 0.001</td>
<td>0.099</td>
</tr>
<tr>
<td>Gender</td>
<td>1</td>
<td>7.447</td>
<td>32.539</td>
<td>&lt; 0.001</td>
<td>0.029</td>
</tr>
<tr>
<td>Age</td>
<td>5</td>
<td>0.327</td>
<td>1.430</td>
<td>0.211</td>
<td>0.007</td>
</tr>
<tr>
<td>Country * Gender</td>
<td>4</td>
<td>0.591</td>
<td>2.581</td>
<td>0.036</td>
<td>0.010</td>
</tr>
<tr>
<td>Country * Age</td>
<td>20</td>
<td>0.429</td>
<td>1.873</td>
<td>0.011</td>
<td>0.034</td>
</tr>
<tr>
<td>Gender * Age</td>
<td>5</td>
<td>0.241</td>
<td>1.054</td>
<td>0.384</td>
<td>0.005</td>
</tr>
<tr>
<td>Country * Gender * Age</td>
<td>17</td>
<td>0.279</td>
<td>1.221</td>
<td>0.240</td>
<td>0.019</td>
</tr>
<tr>
<td>Error</td>
<td>1.076</td>
<td>0.229</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1.133</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected total variation</td>
<td>1.132</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: p < 0.05 is considered significant and is printed in bold.
welfare in France ($t = -5.489, p = 0.001, df = 132$), Colombia ($t = -3.490, p = 0.001, df = 191$), Germany ($t = -7.305, p < 0.001, df = 375$), and in Raipur/SE India, based on the Hindi version ($t = -4.361, p < 0.001, df = 208$). However, no difference could be found in West Bengal, India, based on the English version of the questionnaire ($t = 0.944, p = 0.346, df = 217$).

Age was not a significant factor in the overall model (Table 2), but as shown in Figure 2, we found interactions between age and country (see also Table 2). Age effect was not significant in Colombia ($p = 0.398$), France ($p = 0.062$), and Raipur, SE India, based on the Hindi translation ($p = 0.562$). In the 13- to 18-year age groups, a significant decrease of animal welfare concern occurred in Germany ($F_{(5,371)} = 3.107, p = 0.009$) and in West Bengal, India, based on the English translation ($F_{(5,213)} = 2.498, p = 0.032$).

**Discussion**

To the best of our knowledge, this study provides the first research study examining children’s and adolescents’ attitudes toward animal welfare in four different countries, from three continents with contrasting socioeconomic developmental status. Furthermore, our (CRAS-S) questionnaire integrates 10 different facets of attitudes toward animal welfare, and, thus, provides relatively comprehensive information concerning the perception of animals by the respondents. Therefore, the results may contribute to better understand the influence of age and gender on attitudes toward animal welfare. Our analyses revealed both consistent and highly variable effects. All means of the different countries were slightly above the scale mean (estimated means ranging from 3.17 to 3.82) showing a moderately positive animal welfare attitude in the samples.

![Figure 1. Means of CRAS-S score (± 95% CI) according to country and gender across different areas.](image-url)
Gender

Females constantly displayed higher CRAS-S scores than males (significantly in four out of the five samples despite relatively modest partial eta²). This reflects findings from previous research (Kellert & Berry, 1987; Pagani et al., 2007; Stanisstreet et al., 1993), including those that examine older university students (Herzog, 2007; Mazas & Fernández-Manzanal, 2019; Phillips et al., 2011), the general public (Apostol et al., 2013), and particular groups of people, such as dog owners (Ellingsen et al., 2010). Apostol et al. (2013), found that gender differences were higher in the Animal Attitude Scale (AAS), which deals with general attitudes toward animal welfare than in the belief in animal mind scale. The effect size in our present study with a partial eta² (0.029) can be interpreted as a small to medium effect size.

Mutual nonexclusive underlying bases and interpretations have been proposed to explain gender differences: (1) males may be socialized to be more utilitarian and less emotional, while females are socialized to care and nurture; (2) from an evolutionary standpoint, because males were more involved in hunting than females, they may often see animals as potential food sources; (3) not well-identified (or yet unknown) cognitive-developmental reasons associated with gender differences of moral orientations (Herzog et al., 1991; Knight et al., 2004; Wood & Eagly, 2002).

However, these gender differences in behavior and attitude may not persist throughout time. For example, a program that promoted empathy toward animals was able to reduce gender differences (Angantyr et al., 2016). Therefore, animal welfare attitude may be susceptible to changes. Gender empowerment may also play a role in shaping attitudes toward animal welfare (Phillips et al., 2011). In countries where women are
more empowered, women express greater concern for animal issues than men, whereas in other countries, the responses of males and females were more similar. At the same time, this interpretation is somehow counterintuitive: for example, assuming an evolutionary basis would rather suggest that sex differences should disappear with higher empowerment of women (Phillips et al., 2011). Nevertheless, greater empowerment provides an opportunity for women to develop and express their own attitudes with fewer social constraints.

Concerning both Indian samples, there were gender differences in the region of Raipur/SE India, based on the Hindi version, but not in the sample from West Bengal, India based on the English version of the questionnaire. This might have several explanations. One might lie in the translation of the questionnaire. Another explanation may be related to socioeconomic status or cultural differences within India. We can only speculate on this, but further studies in more Indian regions would be helpful.

**Age**

Although a decrease of attitudes toward animal welfare with age has been widely documented, and thus was expected (Binngiesser et al., 2013; Pagani et al., 2007; Stanisstreet et al., 1993), this was not the case in Colombia, Southeast India (Hindi translation), and France. These marked differences are not due to a sampling artifact, because we used the same age range (13–18 years) for the comparisons. A lack of age effect on attitudes toward animal welfare was found by Martens et al. (2019), who reported no difference in age groups in the AAS in Dutch and Belgian adolescents. This leads to the question of whether results from earlier studies portray a cohort effect rather than an age effect per se. Pro-environmental attitudes tend to decrease with age in children and adolescents (Binngiesser & Randler, 2015; Bogner & Wilhelm, 1996; Bogner & Wiseman, 1997), while cohort effects can influence attitudes (Ormandy et al., 2013). Further investigations are needed to tease apart the contribution of these major factors on attitudes toward animal welfare. As the German data were collected first, and there was an age effect, this might be indeed related to the timing of data collection. We can only speculate on this, but during recent years, animal welfare has become an increasingly important topic in public discussions, which may have reduced age effects. This should be analyzed in further meta-analyses that should assess age effects and relate them to publication/study year. Translation of the questionnaire should not affect age effects, but to study this, a much bigger sample size is needed, and invariance across age groups should be shown by statistical/psychometric methods. The present sample does not allow for this analysis.

**Limitations of the Current Study**

Teachers and/or researchers were present in the classroom to help, but they did not watch the children and did not control their answers. Furthermore, the adolescents did not help or watch each other. An online study might give the students the impression that they are unobserved, but online studies have other problems.
Our study was based on countries with three developmental stages of the HDI, whereas the fourth one was not covered (less developed countries). Despite our efforts to include participants from the 4th HDI stage, we did not receive responses from the invited researchers in the countries that fulfilled this criterion. This should be addressed in future research. However, many studies are based on Western industrialized countries (see below).

Another limitation can be seen in the low Cronbach’s alpha levels for the Indian regions. However, the outcomes obtained in India fully remained in the range of those obtained in the other countries (Figures 1 and 2), suggesting that a possible reliability issue for Indian responses did not generate major problems. Data were also collected at different time points, mostly in 2016, but German data were collected in 2013. However, we do not think that this had any strong impact on our findings.

**Future Research**

Recently, some psychologists criticized that most studies on this topic were carried out in Western, educated, industrialized, rich, and democratic countries ([WEIRD]; Henrich et al., 2010). Therefore, it is important to include such rare data from less developed countries into our studies on attitudes toward animal welfare. Other aspects that should be explored in the future should be individual differences, such as “belief in animal” and “perception of choice”; however, it is important to keep in mind that these concepts arise in English-speaking countries and thus may not be applicable in other cultures, especially when used in countries with non-English-speaking populations.

**Conclusion**

Attitudes toward animal welfare can be influenced by age and gender in different countries but not necessarily in a consistent way. This suggests that cultural aspects play an important role. Further comparative work in other countries is needed to gain an insight into the relationship between attitudes toward animal welfare and socioeconomic status, as well as a deeper analysis of gender differences regarding social role transition and gender empowerment. Scrutinizing the influence of age in contrasted contexts is important to analyze the respective role of the developmental and cohort effects.

**Disclosure Statement**

No potential conflict of interest was reported by the authors.

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**References**


Appendix 1. Items of the CRAS-S in German and English (Randler et al., 2019).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Fully agree</th>
<th>Rather agree</th>
<th>Undecided</th>
<th>Rather disagree</th>
<th>Fully disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>So lange die Tiere ausreichend Futter, Wärme und Licht haben, ist die Käfihaltung von Hühnern in Legebatterien in Ordnung.</td>
<td>[ ]</td>
<td>[ ]</td>
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<tr>
<td>As long as adequate food, warmth, and light are provided, there is nothing really cruel about battery hen farming.</td>
<td></td>
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</tr>
<tr>
<td>Es ist falsch, Krokodile zu töten, um aus ihrer Haut Schuhe und Handtaschen zu machen.</td>
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<td>[ ]</td>
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</tr>
<tr>
<td>It is wrong to kill crocodiles to make shoes and handbags from their skins.</td>
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</tr>
<tr>
<td>Eigentlich würde ich am liebsten Tierarzt werden.</td>
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<tr>
<td>I would like to be a veterinarian.</td>
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</tr>
<tr>
<td>Es ist falsch, Tiere in Zoos zu halten.</td>
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<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>It is wrong to keep animals in zoos.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Alle Insekten sollten geschützt werden.</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
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</tr>
<tr>
<td>All insects should be protected.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Es ist nicht falsch, Wildtiere zu jagen, um sie zu essen.</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
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</tr>
<tr>
<td>There is nothing morally wrong with hunting wild animals for food.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Tiere sind dem Menschen auf jeden Fall unterlegen.</td>
<td>[ ]</td>
<td>[ ]</td>
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<tr>
<td>In my opinion, animals are definitely inferior to humans.</td>
<td></td>
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<tr>
<td>Es ist falsch, Tiere für medizinische Forschung zu verwenden.</td>
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</tr>
<tr>
<td>I do not think that there is anything wrong with using animals in medical research.</td>
<td>[ ]</td>
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</tr>
<tr>
<td>Ich würde gerne einen Teil meiner Zeit dafür verwenden, andere Menschen über bedrohte Tierarten zu informieren.</td>
<td>[ ]</td>
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<td>[ ]</td>
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</tr>
<tr>
<td>Ich würde gerne einen Teil meiner Zeit dafür verwenden, andere Menschen über bedrohte Tierarten zu informieren.</td>
<td>[ ]</td>
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</tr>
</tbody>
</table>

(Continued)
Continued.

<table>
<thead>
<tr>
<th>Please make a cross every line.</th>
<th>Fully agree</th>
<th>Rather agree</th>
<th>Undecided</th>
<th>Rather disagree</th>
<th>Fully disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>about the problems that an endangered animal faces.</td>
<td>[ ]</td>
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</tr>
<tr>
<td>Jagen hilft Menschen, die Abläufe der Natur zu verstehen.</td>
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</tr>
<tr>
<td>Hunting helps people appreciate natural processes.</td>
<td>[ ]</td>
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<td>[ ]</td>
</tr>
<tr>
<td>Alle Tiere sollten geschützt werden.</td>
<td>[ ]</td>
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</tr>
<tr>
<td>All animals should be conserved.</td>
<td>[ ]</td>
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</tr>
<tr>
<td>Es ist falsch, Tiere in Zirkussen einzusetzen.</td>
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</tr>
<tr>
<td>It is wrong to use animals in circuses.</td>
<td>[ ]</td>
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</tr>
<tr>
<td>Mein Haustier ist ein Familienmitglied (oder wäre eines, wenn ich eines hätte).</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
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</tr>
<tr>
<td>I think of my pet as a member of my family (or would if I had one).</td>
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<td>[ ]</td>
</tr>
</tbody>
</table>