

## **5. African and English school children's perception of elephants and elephant conservation**

- *O4: Identify whether school children in countries with and without elephant presence perceive elephants as a threat or as an animal that they value both economically and environmentally.*
- *Main findings: This study indicates that the differences in level of exposure to elephants is significant in influencing school children's perception of elephants and their conservation. school children feared elephants where elephants were native, and students who feared elephants in an area where they were not present were less likely to want to see elephants in the wild. The importance of elephants to the ecosystems they inhabit was only recognized by school children in Kenya. There was a distinct misunderstanding of how elephants benefit other species as well as their feeding behaviours. The perception that elephants were in decline due to too many species in one place, was prevalent throughout school children in South Africa. It was also determined that a wildlife guide as a career choice was not valued as highly compared to other career choices.*

### **5.1 Introduction**

Conducting relevant scientific research on conservation issues and communicating findings with decision makers is essential, however this alone is not adequate to solve complex conservation issues (Kansky and Knight, 2014). Environmental education (EE) is a conservation strategy that can be applied to conservation topics. EE is integral to conservation efforts (Kapur, 2017), being key for engaging decision makers with environmental issues and potential solutions. By implementing synergistic approaches and encouraging participation,

decision makers and stakeholders can collaboratively converse on important conservation issues. This will allow people partaking in EE to take informed action on the environment (Monroe and Karnsy, 2016), enhancing environmental attitudes, knowledge and contributing to the development of both individual and communities' skill set (Ardoin et al., 2019).

The ability to successfully address and resolve conservation issues relies on an environmental education system, with the aim being to provide environmental awareness and suitable information on problems to students of all levels (Alagoz and Akman, 2016). Environmental syllabuses can be adapted and targeted to different educational levels to address the needs of specific target groups (Grodzińska-Jurczak et al., 2006; Palmer, 1995). However, the impacts of environmental education largely depend on the age at which the education process is initiated (Grodzińska-Jurczak et al., 2006). A key strategy that has been implemented for conservation is environmental programmes aimed at school children. Schools play an important role for young children, where they can learn and form positive attitudes about the environment (Barraza and Walford, 2002) as school children are most susceptible to educational influences from adults (parents and teachers) at this age (Knafo and Galansky, 2008).

Educational programmes can aid with the EE in school children, where the knowledge of the environment and its conservation must be integrated so that children form positive, well-informed attitudes towards the environment. Environmental education targeted at school children is important as they are not likely to have fully formed opinions or attitudes about the environment (Pelletier et al., 2004), and positive environmental attitudes that are created in childhood are likely to remain once formed (Asunta, 2003). Promoting positive environmental behaviours is therefore essential at a young age in facilitating positive attitudes and actions towards the environment which in turn supports long-term conservation strategies (Fernando et al., 2005; Meinhold and Malkus, 2005). Added to this, the positive attitudes towards conservation, fostered through EE,

can impact more than just the children who are directly educated. Even though children are susceptible to educational influences from adults, children can influence their parents' values both intentionally and unintentionally (Knafo and Galansky, 2008). Studies have highlighted the importance of targeting children, for nurturing positive environmental behaviours and help spread positive effects of EE programmes to a wider demographic (Rakotomamonjy et al., 2014; Damerell et al., 2013). This is prominent when families are close, as children can act as message multipliers, transferring their knowledge to their communities (Domroese and Sterling, 1999).

The need for EE is engrained in conservation issues such as protecting nature and wildlife, because of the rising human population and other threats (Athman and Monroe, 2001; Fraser et al., 2015). Environmental education programmes aimed at species conservation often attempt to increase knowledge and awareness of conservation issues, as well as inspiring people to act in a positive environmental way (Barney et al., 2005). This is especially important when considering endangered species that need effective conservation, as these species would likely not survive without intervention strategies. Elephants are one such species that need effective conservation, as they are faced with challenges such as land fragmentation, poaching and habitat destruction, causing population numbers to decline (Leimgruber et al., 2003; Nelson, Bidwell, and Sillero-Zubiri, 2003). Attitudes towards animals develop early in life (Sieber, 1986; Takooshian, 1988) and remain constant through adult life, so it is essential to be able to determine elephant conservation perceptions at an early stage. Understanding children's perception of elephant conservation could improve conservation education delivery, enhancing children's connection to elephants which is crucial for their long-term conservation (Ardoin and Bowers, 2020). This way, a better understanding of children's attitudes can be achieved.

Perceptions of elephants and elephant conservation can depend greatly on location. Within countries that have elephant presence, there can often be direct conflict in rural areas, where

people share the same habitat as elephants. Kwamboka (2013) surveyed school children's attitudes of elephants in and around Samburu National Reserve, finding that there were both positive attitudes associated with tourism and ivory, and also a fear of elephants. Human-elephant conflict (HEC) can inflict negative attitudes towards elephants and hinder conservation efforts and elephant survival. HEC is largely caused by crop raiding, where elephants feed on crops that leads to major economic losses for affected farmers and their families (Santiapillai, 1997; Fernando et al., 2005; Gubbi, 2014). A less well documented form of HEC is that elephant presence may interfere with children's attendance in school in wildlife areas (Sitati et al., 2012). However, many schools benefit from wildlife tourism revenue for infrastructure development and raising funds for students' education. This can often be the case in urban areas that are underdeveloped and depend on charitable support. Even though HEC is an increasing issue for the people that live near elephants (Leimgruber et al., 2003; Goswami et al., 2014), elephants are keystone species for savanna ecosystems, promoting diversity of both habitats and the species (Western, 1989; Brooks et al., 1983). If elephants were to become extinct, it would have major implications for the ecosystems they are found in. Therefore, finding ways to mitigate HEC through EE can be used to facilitate attitudes towards problem species as a method of resolving conflict (Conforti and Azevedo, 2003).

Within countries that don't experience HEC, elephants are seen as charismatic and intelligent species (Banadara and Tisdell, 2003). School children are often taken to zoos to see wildlife first-hand alongside EE practises. Their perception of elephants is likely to be driven by their surroundings of what people communicate with them, from pictures, videos, and other media sources. Although this can be largely positive, there is also a negative side to social media such as videos of riding elephants (Gurusamy et al., 2015) promoting negative and harmful tourism. Tourism can offer a huge revenue for countries with elephants' presence, and career opportunities for those without elephant presence, therefore education practises that encourage

wildlife conservation career opportunities to both people living with and without elephants is needed. Additionally, student participation in ex situ education programmes is important for raising awareness in order to provide vital funds for wild elephant conservation (Makecha and Ghosal, 2017). It is important to understand how school children perceive elephants to enable improved methods of conservation education delivery. There has been little focus on assessing elephant conservation education programs, both in situ and ex situ (Makecha and Ghosal, 2017). It is important that both in situ and ex situ conservation education programmes are targeted towards elephant conservation, to raise awareness and encourage positive engagement with elephants.

Environmental education programmes based on environmental issues need to be carefully applied depending on how school children perceive issues around elephant conservation. This can only be achieved if there is a clear understanding of school children's perception, in and ex situ of elephants which will likely be influenced by the level of exposure to elephants. The aim here is to determine how school children in England and Africa perceive elephants and their importance. England was chosen as a study site to give insights on the perceptions that school children have of elephants in a country where elephants are not indigenous, and both Kenya and South Africa as they represented areas where elephants are native. These selected countries were also accessible to conduct research. The age group of 10–16-year-olds was selected. This demographic was chosen as children of this age will not only have been taught some environmental education practices but are able to make their own decisions determined by their opinions on elephant conservation. Using questionnaires, the aim here is to compare school children's attitudes towards elephants in England, where elephants are found in zoos, with Kenya and South Africa, where elephants are found in the wild. Location of the school was used as an indicator of exposure to elephants, and how that affects participant views of elephants and elephant conservation.

## *Aims*

The aim of this study is:

To determine how school children in the England and Africa perceive elephants and elephant conservation.

This will be accomplished by answering the following research questions:

1. Do school children perceive elephants as a threat or as something they want to see in the wild?
2. Do school children recognise the importance of elephants within ecosystems?
3. Can school children that have different levels of exposure to elephants identify elephants and do they perceive any threats to elephants?
4. Do school children recognise the importance of wildlife guides as a career choice?

## **5.2 Methods**

### *5.2.1 Study sites*

Three different countries were used as sites of interest and to provide a comparative approach: England, Kenya, and South Africa.

**Table 5.1** Study site locations

<b>Study location</b>	<b>Age group</b>	<b>Sample size</b>	<b>Elephant exposure</b>	<b>Land use</b>
<b>England: Wrenn School, Wellingborough</b>	10-16	172	In captivity	Urban environment
<b>Kenya: Brainhouse School, Mathare North, Nairobi</b>	10-16	95	Predominantly open reserves	Rural and urban environment

<b>South Africa: Diputhi School, Limpopo</b>	11-16	97	Fenced reserves only	Mostly rural environment
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### ***5.2.1.1 England***

Several schools were contacted across the West Midlands region in England. A selection of schools responded positively, and one was used for data collection: Wrenn School, Wellingborough (Table 5.1). Although other schools did respond positively, the number of respondents that completed the online questionnaire was unsuitable (<5 respondents).

People living in England are expected to have positive perceptions of elephants, with many charities in the country encouraging elephant conservation. A large amount of positive information is disseminated to school children via nature documentaries, social media and story books. Exposure to non-sustainable wildlife tourism, such as riding or touching elephants, is still very prevalent. Without sufficient education on the implications of these practices, many people are willing to participate in activities such as these. Knowledge around the issues associated with the ivory industry remains limited, as UK law still allows the sale of antique carved or worked ivory dating from before 1947. Opportunities to see African elephants for school children in England can be achieved by travelling to countries within the distribution ranges of the species for wildlife tourism or visiting elephants in zoos. The opportunity for overseas safaris would only present itself if families were affluent, as vacations like these are extremely costly.

### ***5.2.1.2 Kenya***

The study site in Kenya represents an area that does not have wild African elephants in proximity, therefore HEC is low in direct relation to school children at this location. However, there is the opportunity to access rescued African elephants if travel is available. The David

Sheldrick Wildlife Trust (DSWT) elephant sanctuary is a small, fenced enclosure (1.5 km<sup>2</sup>) on the Western edge of Nairobi National Park, which is approximately 15 km from the school.

The selected school is 'Brainhouse School', which is located Mathare North slum, Kenya, one of the world's largest slums. It is a largely urban area, with a lack of rural areas (Table 5.1). This is an area on the outskirts of Nairobi, and people live in poverty with lack of housing, sanitation, and the basic needs. There are over 1000 pupils within the school, some are orphans that live at the school and are taken care of by the teachers and older students. Brainhouse School is reliant on funding from charities, which provide safe and nutritious food and drinking water, a secure place to sleep, safe sanitation and education and training. Charities have been working with this school over the last decade, to not only provide external funding but also providing environmental education. This includes teaching about the environmental issues that are being faced within their country. There have also been school trips offered by charity organisations to the DSWT sanctuary as an incentive for high achieving students. The opportunity to see elephants at the DSWT is likely to be the only opportunity children have to see elephants.

### ***5.2.1.3 South Africa***

The population of elephants in South Africa continues to increase (see Chapter 1). This is due to the populations of elephants sustained in fenced reserves, which includes the largest game reserve in South Africa: Kruger National Park. Land is highly fragmented, meaning that the only way of sustaining elephants is to have them present in fenced nature reserves, wildlife parks etc. However, even though they are confined to specific locations, areas surrounding fenced reserves are still confronted with HEC. In some instances, elephants can break out of fenced reserves, and come into conflict with farmers as they can decimate their land, and importantly their crops which they are reliant on to make a living.

The study site in South Africa, is Diputhi School. The school is for children who live in the surrounding village, where the area is largely rural (Table 5.1). There are a few private nature reserves within proximity to the school; Karongwe Private Game Reserve (KPGR) is 500m from the school. Even though the reserve is in proximity of the school, this does not mean that the students are able to see the wildlife for themselves. Game reserves are managed by landowners, who in turn manage who can enter the reserve through monitored gates. This is usually only landowners, tourists and any organisations that work within the reserve. Global Vision International (GVI) run a research station within the reserve, where volunteers from all over the world travel to this location to participate in wildlife research. There is a community engagement aspect of the research station, where volunteers take part in an outreach programme at the school by giving lessons about environmental awareness. This is key in engaging children about the importance of wildlife, which may not be as readily given in the school. The opportunity also enables students to communicate with people from many different backgrounds. There is a positive attitude towards conservation and encouragement from international volunteers. However, children living within the school are likely greatly influenced by information they receive from teachers and family. Without suitable education and job opportunities, there may be a greater association with seeing elephants as a monetary resource from poaching if anyone in the student's family take part in these practises.

### ***5.2.2 Adaptations due to COVID-19***

Data collection was anticipated during the spring of 2020. This data collection projected travel to schools in the U.K., South Africa and in Kenya to speak directly to school children and collect their responses; 50 responses per school was anticipated. However, at that time, the COVID-19 pandemic hit, meaning that travel was no longer permitted, as lockdown 1 was initiated and all travel was terminated from the U.K.

Therefore, the data collection methods had to be adapted according to the new government guidelines. This meant making all questionnaires accessible online. This was straightforward to implement in the England as all school children began to work from home from April 2020. Multiple teachers across several schools in England were reached out to, and Wrenn School, Wellingborough completed the data collection with their pupils as a set homework task. 172 questionnaires were completed online from March to June 2020.

However, schools in Kenya and South Africa had different restrictions. School children in both Kenya and South Africa were told to work from home. A teacher in Kenya assured us that they could be completed online and returned within the same timescale as the questionnaires in England. This, however, did not happen due to a multitude of reasons including insufficient access to internet cafes for the children to complete online. The schools in question had no access to personal laptops, or devices at home that would have enabled them to complete the online questionnaire independently. Therefore, it was advised to wait until this could be done in person when schools reopened in Kenya. This was achieved through another contact of the school, who was able to get physical copies of the questionnaires to the school. 100 were given to students, and 95 were returned completed and sent over as photographs.

A similar situation occurred in South Africa, where data collection could only be achieved once the school children has returned. These were printed in person and completed, scanned, and returned to researchers at GVI in October 2020. Out of the 116 that were completed, 97 were used for further analysis as the remaining responses were incomprehensible.

### ***5.2.3 Questionnaire development***

#### ***5.2.3.1 Pilot study***

A pilot questionnaire was developed with approximately 20 questions so that there was sufficient information to extrapolate data and gain inference from. To answer the research

questions, key concepts were developed that needed to be formulated into age relatable questions. This was developed into a questionnaire that was used for the pilot study that was ran with a teacher in the U.K. (Table 5.2).

**Table 5.2** Pilot questionnaire layout

Question	Response		
	Boy	Girl	Prefer not to say
Age			
Gender	Boy	Girl	Prefer not to say
Have you ever seen an elephant in the wild? (Not in zoos)	Y		N
Would you like to see elephants in the wild?	Y		N
Do you think elephants are important?	Y		N
Do you think that elephants help other species, including both plants and animals?	Y		N
Are you afraid of elephants?	Y		N
Do you like to see the pictures of elephants, without feeling the desire the see them in the wild?	Y		N
Would you like to learn more about elephants?	Y		N
Do you think that elephants have the right to be free?	Y		N
Do you think elephants are under threat?	Y		N
Do you know what poaching is?	Y		N

Have you ever considered a career in wildlife conservation?	Y	N
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Piloting is essential to check if respondents understand the questions as intended, determine the timescale of completion, and to enable feedback. The pilot questionnaire (Table 5.2) was given to a class of 20 students aged between 10 and 16 at Dixon’s Trinity Academy, Bradford, England which was accessible. There were some questions which could have been improved. For example, considering children’s hobbies to measure as respondent data for all participants. It was also determined that beginning a question with “Do you think that...” was unsuitable for this study, as responses will likely be yes, which would lack workable information. This leading question was removed, to prevent social desirability bias (Larson, 2019). It was also decided that adding an open question (why, how, etc..) option for several questions would be beneficial to gain a better level of their understanding. Additionally, the question regarding poaching was not actually measuring their knowledge of poaching, just a perception of their knowledge. It was decided that an improved way would be to ask the students what threats there are to elephants, and then categorise their answers further. Finally, the question with regards to wildlife conservation was determined to be ambiguous. There may not be an understanding amongst the demographic of what a career in wildlife conservation is, and what it consists of. Therefore, a better option would be to list several popular career choices and ask the children to rank them from least favourite to most favourite. Taking all this into account, the pilot questionnaire was enhanced, and the final version can be seen in Table 5.3.

### 5.2.3.2 Final study

Table 5.3 shows the final questionnaire used in the present study:

**Table 5.3** Amended questionnaire from pilot study used as the final copy for disseminating across study sites

**Questionnaire**

*Please fill out this questionnaire to the best of your ability. Please circle any Yes/No answers*

1. What is your age? \_\_\_\_\_

2. Which country do you live in? \_\_\_\_\_

3. What gender are you?

Male \_\_\_\_\_ Female \_\_\_\_\_ Other \_\_\_\_\_ Prefer not to say \_\_\_\_\_

4. What are your hobbies? Please give three:

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5. Which of the images below is an elephant? Please tick one:



6. Are elephants important?

Yes No

7. If Yes to question 6, why do you think elephants are important?

8. Do you think that elephants help other plants and animals?

Yes    No

9. If Yes to question 8, how do you think elephants help other plants and animals?

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10. Are you afraid of elephants?

Yes    No

11. If Yes to question 10, why are you afraid of elephants?

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12. Would you like to see elephants in the wild?

Yes    No

13. Would you like to learn more about elephants?

Yes    No

14. Do you think elephants should be kept in fenced areas?

Yes    No

15. Elephant numbers all over the world are under threat. Rank the most important (1) to the least important (4) reason why you think this is:

Loss of habitat from cutting down trees \_\_\_\_\_

Killing elephants to sell their tusks \_\_\_\_\_

Humans and elephants not being able to live together \_\_\_\_\_

Too many different animal species in the same area \_\_\_\_\_

16. Please rank the following careers from your most favourite (1) to least favourite (8):

Teacher \_\_\_\_\_

Doctor \_\_\_\_\_

Veterinarian \_\_\_\_\_

Artist \_\_\_\_\_

Musician \_\_\_\_\_

Athlete \_\_\_\_\_

Wildlife Guide \_\_\_\_\_

Business manager \_\_\_\_\_

17. What do you think elephants eat? (Choose one)

Trees \_\_\_\_\_

Grasses \_\_\_\_\_

Both trees and grasses \_\_\_\_\_

Other small animals \_\_\_\_\_

18. Do you think elephants can damage trees?

Yes    No

19. What do you think a wildlife guide does?

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*End of questionnaire*

These were given to each school at the study sites. Student participating in the study in Kenya and South Africa can be seen in Figure 5.1. Questions were unambiguous by making sure multiple aspects were not asked at once. Some of the questions were not open ended or unstructured so it was crucial that the options were fine grained enough to collect appropriate data to answer the research questions. In this context, scaling of answer options is important to reflect the different types of answering options.



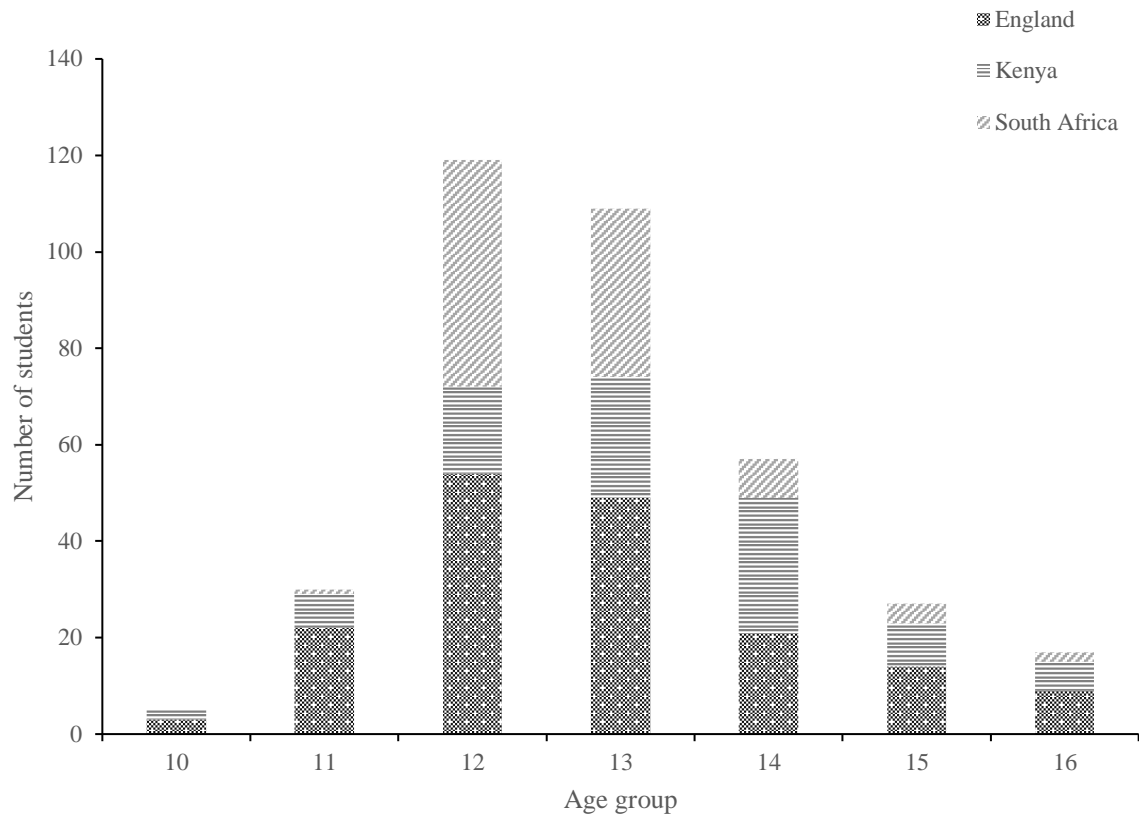
**Figure 5.1** School children in South Africa (Site 2; Top image) and Kenya (Site 3; Bottom image) completing questionnaires. There are no images of school children completing the questionnaire in England as these were completed online

#### **5.2.4 Data analysis**

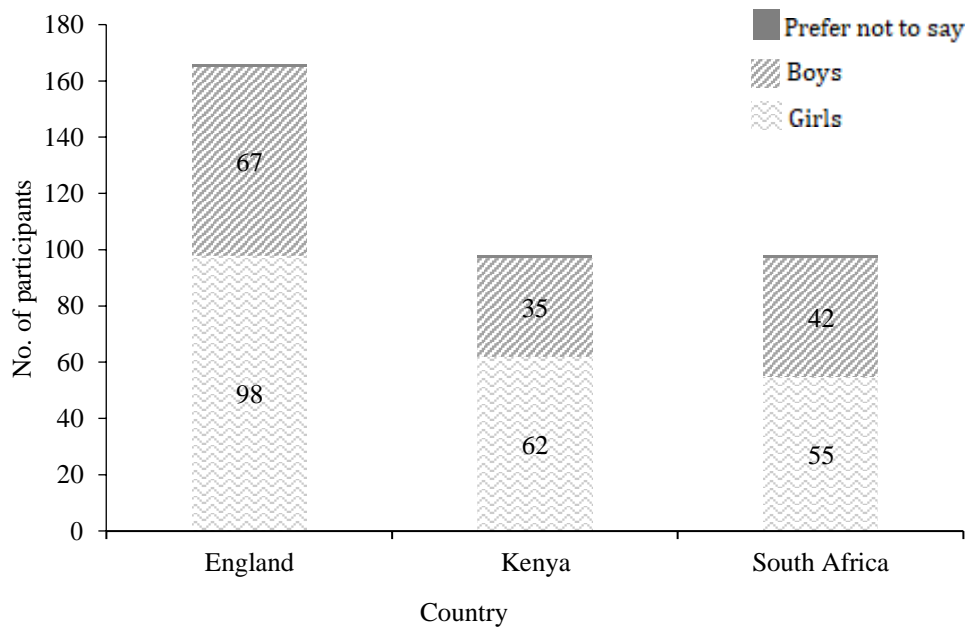
Descriptive statistics were used to explore school children's fear of elephants and their desire to see elephants in the wild; school children's views on the importance of elephants and how they perceive this within ecosystems; whether they can identify elephants and their perception of threats to elephants; and whether they value wildlife guiding as important career choice. Data visualisation was used to interpret responses. Additionally, a Likert scale was used to measure respondents' attitudes towards career choices. Neutral responses are distributed across the vertical axis at 0. The negative responses are then stacked to the left of the vertical axis and positive answers to the right. The less important the career choice is, the more it is skewed to the left. The link between children's reasons for fear and desire to see elephants in the wild as well as their perception of elephant important within ecosystems was examined. To better examine relationships between fear and desire, responses were categorised based on keywords. Each category was compared with association to fear. All responses tested were binary: 'Yes', 'No'. The significance of interactions of reasons for fear and desire, and importance related to ecosystems was tested using Chi-square tests of independence. Binomial logistic regression tests were considered to determine how much of the variation was explained by the independent variable. However, Chi-square tests were deemed more suitable for the study questions. All statistical analyses were performed using R (R Core Team, 2014).

#### **5.3. Results**

Data were collected from each school, and then analysed both independently and collectively, depending on the research question. There were 364 respondents in total: 172 students completed the questionnaire at the school in U.K. (Wrenn School), 95 in Kenya (Brainhouse School) and 97 in South Africa (Diputhi School). Most participants were aged between 12-13, (n=118 and n=109, respectively) (Figure 5.2). In total, 60% of school children were girls, 39% were boys and 1% preferred not to say (Figure 5.3).



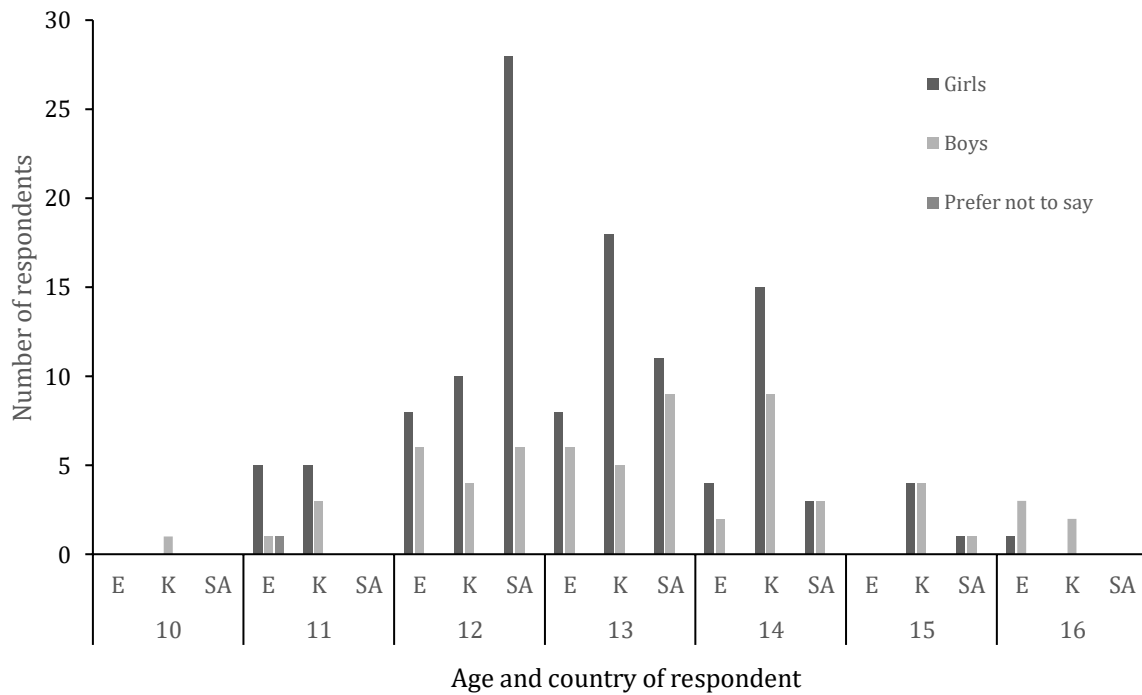
**Figure 5.2** Demographic of sample population participating in the data collection (n= 364).



**Figure 5.3** Gender split of participants across each country that partook in the study

**5.3.1 Do school children from all countries perceive elephants as a threat or something they want to see in the wild?**

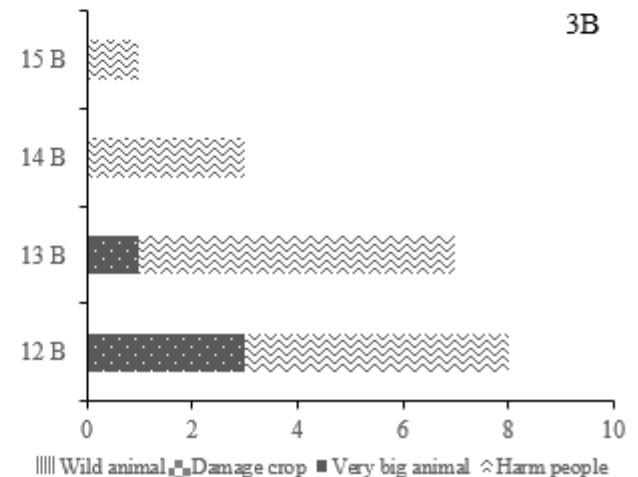
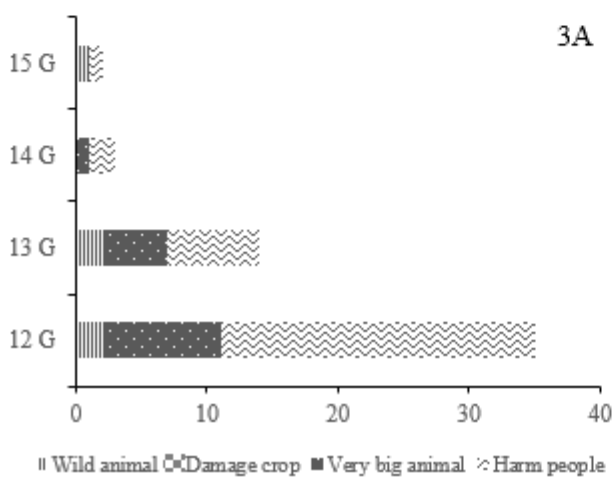
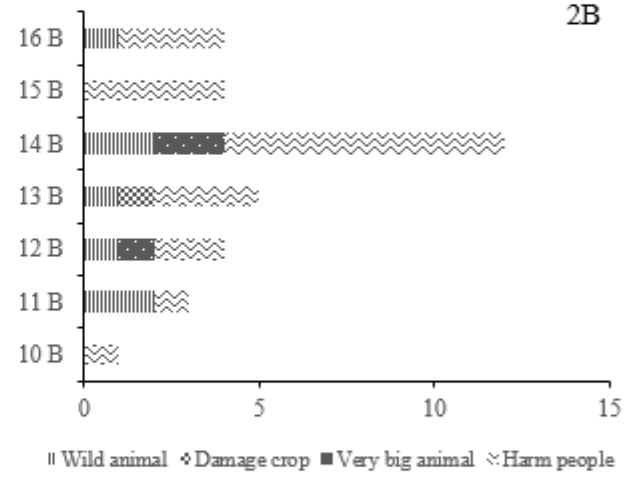
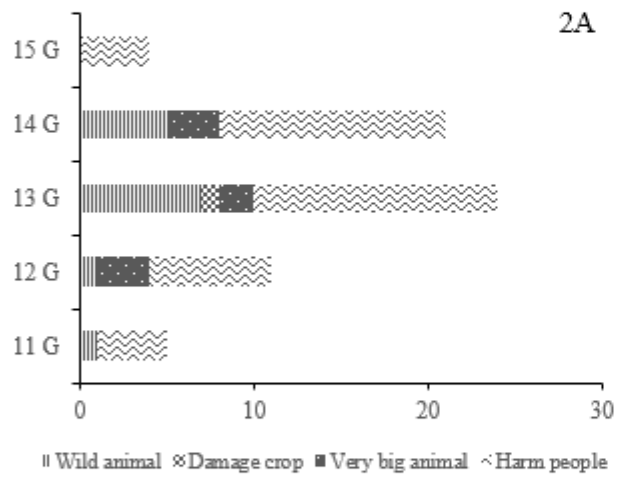
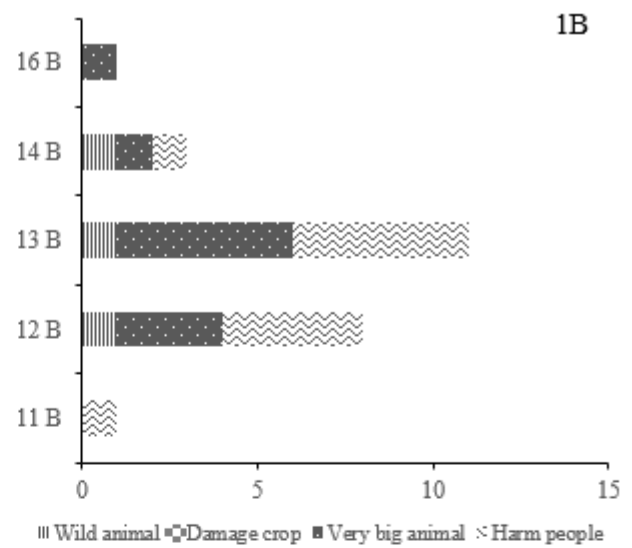
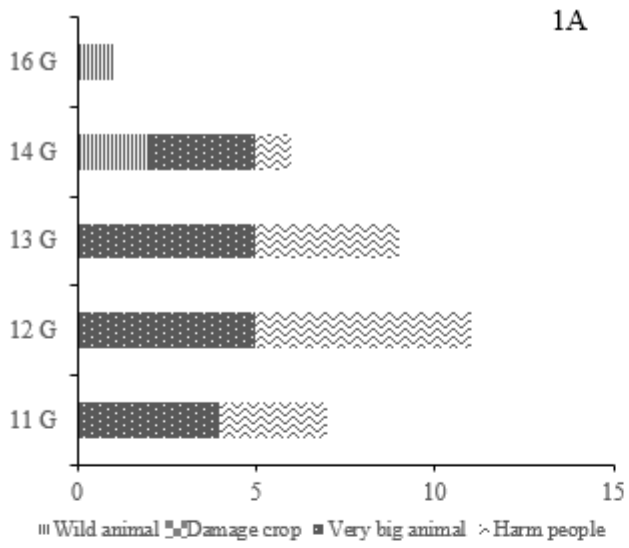
Out of the total responses (n=364), 186 respondents were afraid of elephants, of which 11% thought that elephants were important (n=22). Figure 5.4 shows the distribution of responses for each age and country. 12-year-old girls in South Africa were the most afraid of elephants (28). The older age group (15–16-year-olds) were less afraid overall of elephants. Collectively, girls were found to be more afraid of elephants than boys (33%; 18% respectively). This trend could be influenced by a great number of girls completing the survey (England: 26 and 18; Kenya 52 and 28 and South Africa: 43 and 19).



**Figure 5.4** Demographic of sample population and their fear of elephants at each country level (n=187): E = England; K = Kenya and SA = South Africa.

Children in England were less afraid of elephants than children in Kenya and South Africa. 73% of the respondents in England were not afraid of elephants, compared to 17% in Kenya and 35% in South Africa out of the total sample size from each school.

All students that were afraid of elephants were asked for their reasoning of this fear to measure their opinions. The open-ended question showed variations in responses. Categories using keywords from all responses were identified. These were as follows: ‘Wild animal’, ‘Harm people’, ‘Crop damage’ and ‘Very big animal’. There were mixed distributions of responses across all countries, age group and gender (Figure 5.5). Of the 186 respondents who were afraid of elephants, only one commented that they were afraid of all animals, and not elephants only. All the remaining reasons for fear were directly associated to elephants.



**Figure 5.5** Categorical responses of fear of elephants for each gender and age group. Each graph represents a different country and gender: 1A and 1B = England, 2A and 2B = Kenya, 3A and 3B = South Africa; G = Girls, B = Boys

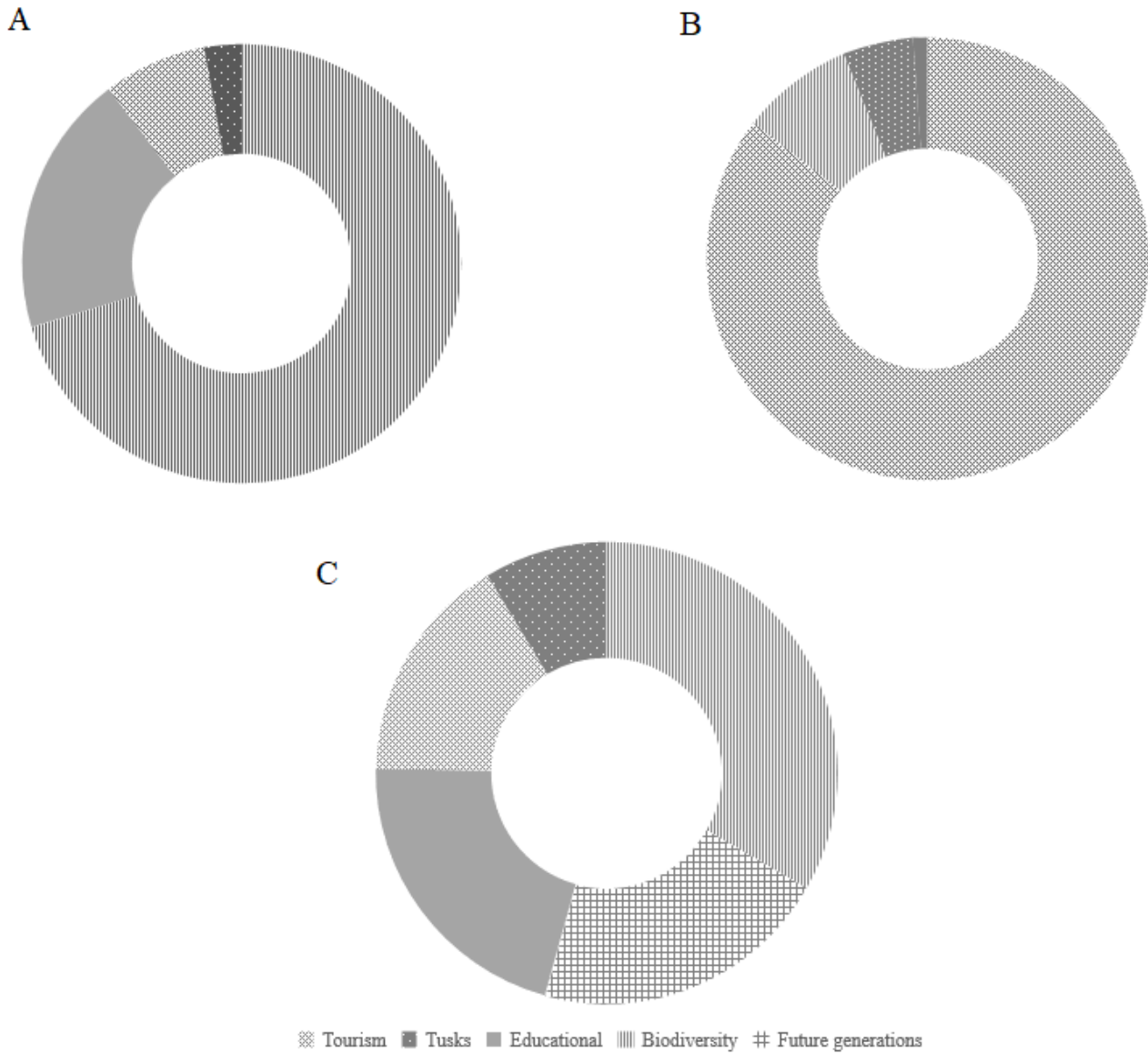
It was then determined whether the children's fear influenced the likelihood of wanting to see an elephant in the wild. Out of the 186 who responded with 'Yes' to being afraid of elephants, 168 wanted to see an elephant in the wild even with this fear. Pupils in England who fear elephants less, would like to see elephants in the wild more ( $X^2(1) = 20.6, P < 0.001$ ). Fear of elephants was not found to influence the desire to see elephants in the wild in South Africa and Kenya ( $X^2(1) = 0.4, P = 0.8, X^2(1) = 0.6, P = 0.4$ , respectively) (Table 5.4).

Most of these respondents were afraid of elephants as they can 'Harm people' (75%). Only 20 respondents did not want to see elephants in the wild. Even though 46% of participants had a fear of elephants, they would still like to see them in the wild.

Each identified fear category was tested to determine any associations with desire. The 'Damage crop' category was not used as there were only two responses. In England, school children who chose the remaining three categories were less likely to want to see elephants in the wild (Wild animal:  $X^2(1) = 6.08, P < 0.001$ ; Harm people:  $X^2(1) = 9.45, P < 0.001$ ; Very big animal:  $X^2(1) = 9.45, P < 0.001$ ). There were no differences found for each category and desire to see elephants in Kenya and South Africa (Table 5.4).

### ***5.3.2 Do school children recognise the importance of elephants within ecosystems?***

Firstly, it was determined whether school children thought that elephants were important: 90% of all participants thought that elephants were important. Five factors were identified as reasons for why the respondents justified their importance (Figure 5.6). These included the following: elephants are essential for tourism and an income revenue ('Tourism'); their tusks are important for income and medicinal reasons ('Tusks'); we can learn a lot from elephants from the past and we should learn to care for them ('Educational'); they are important for other plants and animals ('Biodiversity') and finally, they are important for future generations to see ('Future generations'). The most important factor varied significantly depending on location (Figure 5.6).

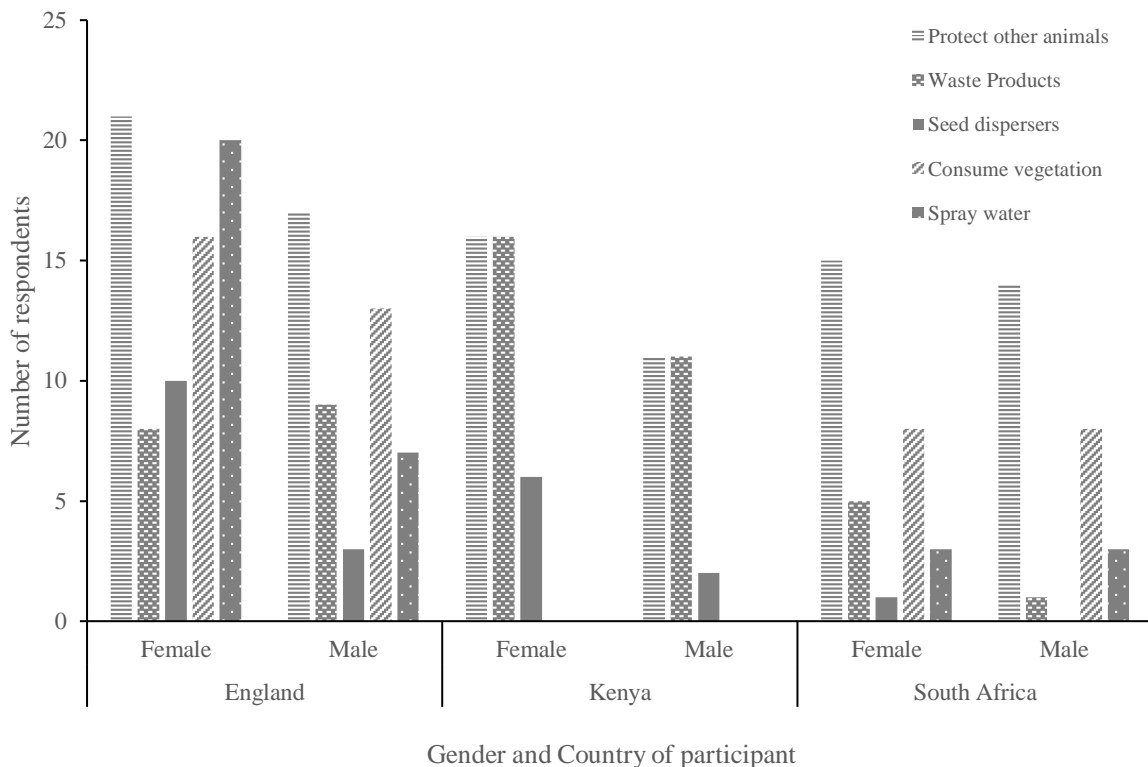


**Figure 5.6** Responses of why school children think elephants are important in each country.

A = England, B = Kenya, C = South Africa

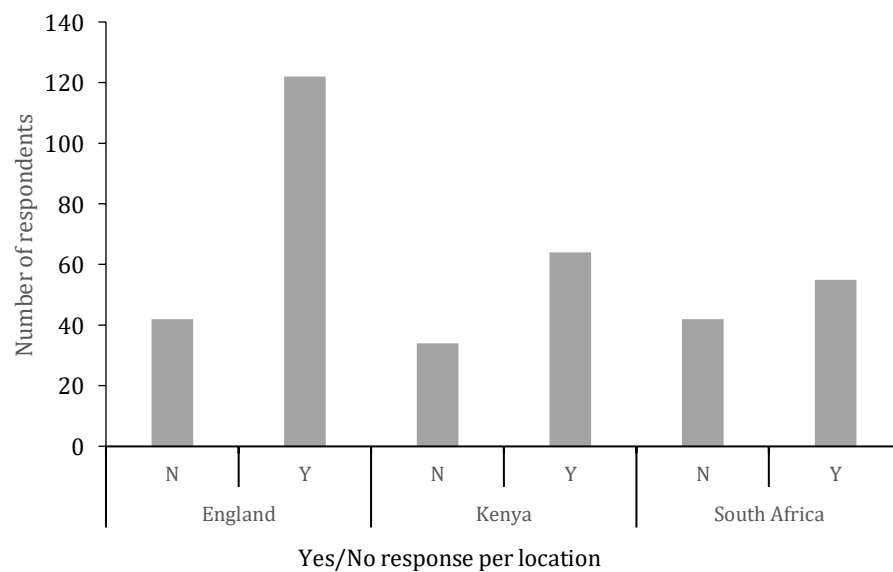
Considering all respondents, the largest category was ‘Biodiversity’ (42%), which suggests that school children are aware of elephant’s importance within the ecosystem. To test this further, all respondents were asked whether they thought that elephants help other plants and animals, followed by an open-ended response.

Most of the respondents (n=237) thought that elephants help other plants and animals. Of these, 25 respondents did not specify why they thought elephants were important and left the option blank. From the open-ended question, the responses were categorised into the following: ‘Protect other animals’; ‘Waste products’; ‘Seed dispersers’; ‘Consume vegetation’; ‘Spray water’. ‘Waste products’ were classified from responses stating that their faeces help other animals and ‘Spray water’ was classified from answers stating that elephants use their trunks to spray water on plants. The most common response from all countries was that elephants protect other animals(38%) (Figure 5.7). Results here also show that school children in England and South Africa are aware that elephants eat vegetation. A high proportion of respondents in England said that elephants help other plants and animals by spraying water on them (Figure 5.7).



**Figure 5.7** Explanations for the importance of elephants across all countries considering all respondents

Responses gave insights that children were aware and believed it is important that elephants ‘Consume vegetation’ in both England and South Africa. It was then determined whether respondents thought that elephants could damage trees. Interestingly, even though children from Kenya did not acknowledge that elephants consume vegetation, most participants thought that they damaged trees (65%). Most school children in England were aware that elephants damage trees (74%) (Figure 5.8). However, there were no associations between whether children thought elephants are important and if they damage trees ( $P > 0.05$  for all countries; Table 5.4).



**Figure 5.8** Total participant response to whether elephants damage trees

Chi-squared tests were used to test whether there was a difference between children who thought elephants were important or not in relation to several behavioural and environmental variables (Table 5.4). These were: their fear of elephants, the desire to see elephants in the wild; whether they want to learn more about elephants; whether elephants helped plants animals;

whether elephants should be kept in fenced areas and whether elephants damaged trees. Of these, school children in England who thought elephants were important thought that they helped other plants and animals ( $X^2(1) = 10.7, P < 0.05$ ) and wanted to learn more about elephants ( $X^2(1) = 3.97, P < 0.05$ ). Children who thought elephants were not important did have a fear of seeing them in the wild ( $X^2(1) = 7.95, P < 0.05$ ). The only association found with school children in Kenya, was between importance and learning: children who thought elephants were important would like to learn more about elephants ( $X^2(1) = 0.04, P < 0.05$ ; Table 5.4). There were no associations between importance and whether elephants should be kept in fenced areas and if they could damage trees ( $P > 0.05$ ; Table 5.4).

Finally, it was determined whether school children were aware of what elephants eat: Trees and Grasses. When considering all responses, most school children were aware that elephants eat both trees and grasses (59%). A small number of students in each country thought that elephants consume other small animals (Appendix 2; Figure A.2.2).

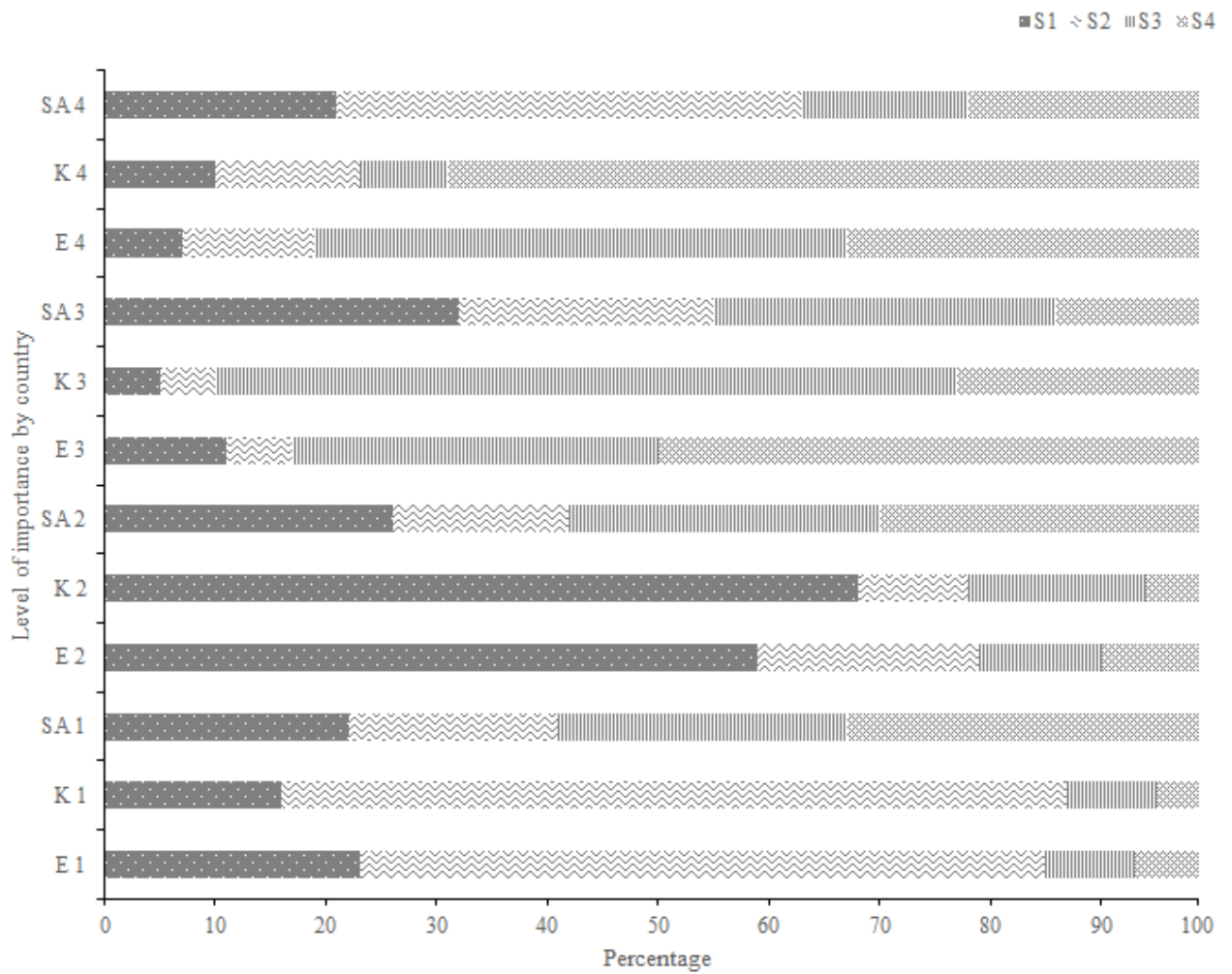
**Table 5.4** Chi-squared test results showing the relationship between two variables for each country

		<b>England</b>			<b>Kenya</b>			<b>South Africa</b>		
<i>Variables</i>		<b>x</b>	<b>df</b>	<b>P-value</b>	<b>x</b>	<b>df</b>	<b>P-value</b>	<b>x</b>	<b>df</b>	<b>P-value</b>
<b>Q1</b>	Fear + Desire	20.6	1	<b>&lt;0.05</b>	0.4	1	0.8	0.6	1	0.4
	Wild animal + Desire	6.06	1	<b>&lt;0.05</b>	0.1	1	0.9	0.7	1	0.7
	Harm people + Desire	9.45	1	<b>&lt;0.05</b>	0.2	1	0.9	0.66	1	0.42
	Very big animal + Desire	9.45	1	<b>&lt;0.05</b>	0.4	1	0.8	0.74	1	0.39
<b>Q2</b>	Important + Help plants and animals	10.7	1	<b>&lt;0.05</b>	0.62	1	0.42	0.4	1	0.8
	Important + Fear	7.95	1	<b>&lt;0.05</b>	0.5	1	0.8	0.4	1	0.8
	Important + Desire	1.5	1	0.22	0.4	1	0.8	1.3	1	0.9
	Important + Learn	3.97	1	<b>&lt;0.05</b>	8.9	1	<b>&lt;0.05</b>	1.03	1	0.31
	Important + Fence	0.5	1	0.46	0.4	1	0.8	2.816	1	0.09
	Important + Damage	3.06	1	0.08	0.3	1	0.8	0.82	1	0.36

### ***5.3.3 Can school children that have different levels of exposure to elephants identify elephants and do they perceive any threats to elephants?***

A picture of an elephant and rhino was used in the questionnaire to determine whether school children from each country were able to identify an elephant. Three students from England and one student from Kenya incorrectly identified an elephant as a rhino. All remaining participants could correctly identify an elephant (n=360).

All participants were asked to rank why they thought elephant numbers were under threat from the most important (1) to the least important (4). Four reasons were provided for the participants to select (S) from: Loss of habitat from cutting down trees (S1); Killing elephants to sell their tusks (S2); Humans and elephants not being able to live together (S3); Too many different animal species in the same area (S4) (Figure 5.9). There were mixed distributions of responses across all countries (Figure 5.9).



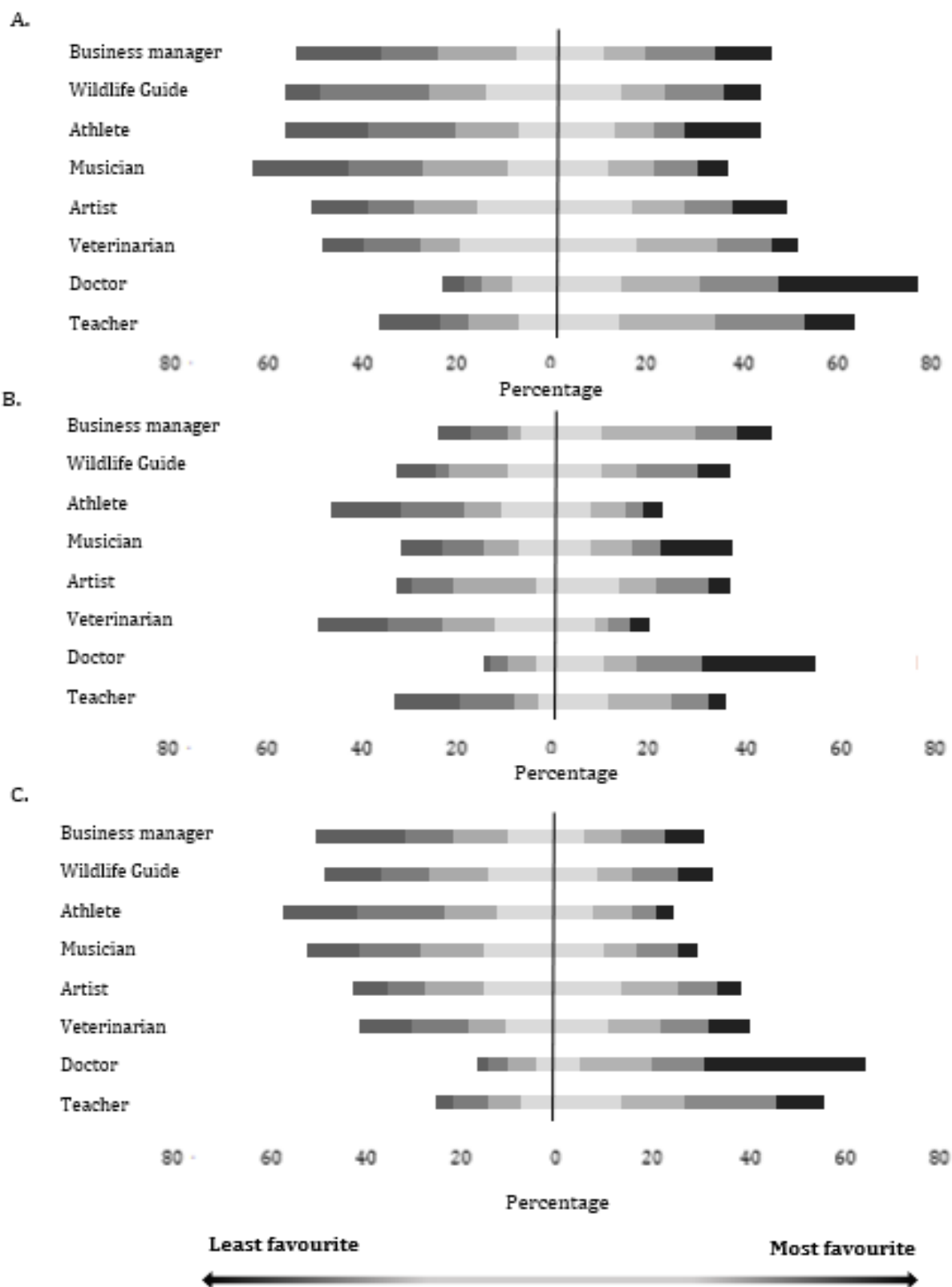
**Figure 5.9** Percentage split of the level of importance of elephant decline per country (E = England, K = Kenya, SA = South Africa). S1, S2, S3, S4 – see text (section 5.3.3).

#### ***5.3.4 Do school children recognise the importance of wildlife guides as a career choice?***

To determine whether school children thought that wildlife guides were valued as a career choice, participants were then asked to rank eight career options from most favourite (1) to least favourite (8). These career options were as follows: ‘Teacher’, ‘Doctor’, ‘Veterinarian’, ‘Artist’, ‘Musician’, ‘Athlete’, ‘Wildlife Guide’ and ‘Business Manager’. The responses were analysed by gender split and each country.

Data was then collated data from all students and their favourite career choices across each country were identified. Figure 5.10 shows the distribution of responses for the most favourite career choice. Neutral responses (career choice ranked 3<sup>rd</sup> and 4<sup>th</sup>) are distributed across the vertical axis at 0. The negative responses are then stacked to the left of the vertical axis and positive answers to the right. The less important the career choice is, the more it is skewed to the left. The more important the career choice is, the more it is skewed to the right. In all countries, school children’s favourite career choice was a Doctor (A =29%, B = 34%, C = 41%; Figure 5.10).

Across all countries and gender (Figure 5.10), ‘Wildlife Guide’ was not considered as the most important career choice (Appendix 2: Table A.2.1).



**Figure 5.10** Response values on a Likert-scale showing importance of career choices per country: A = England, B = Kenya, C = South Africa

School children were asked what they thought a wildlife guide does, so it could be determined whether or not they knew what this job role involves. This was done via an open-ended response to gauge their opinions.

According to Henke and Krausman (2017), a wildlife guide “guides guests through nature, whether by vehicle, canoe, horseback or on foot. Their job is to explain some of the remarkable secrets hidden within the natural environment, and to act as a link between the guests and nature. They are also considered to be crucial to conservation since they are able to spread its message far and wide through many people they meet with their role”. The responses were categorised into the following: ‘Guide and teach tourists/people’ (Category1), ‘Care for animals’(Category2), ‘Follow the rules of the park’(Category3). Most students thought that a wildlife guides role was to guide and teach tourists and people (n=288). Twelve students in England and three in South Africa responded with ‘I don’t know’ (Table 5.5).

Sixteen girls in Kenya and South Africa responded with ‘He guides and teaches the tourists’. None of the remaining responses were gender specific.

**Table 5.5** Categorized responses of what pupils from different countries and gender perceive a ‘Wildlife Guides’ role is

<i>Country</i>	<i>Gender</i>	<i>Category1</i>	<i>Category2</i>	<i>Category3</i>
England	Girl	68	19	0
	Boy	47	11	0
Kenya	Girl	78	16	7
	Boy	29	4	2
South Africa	Girl	36	17	1
	Boy	30	11	2

## 5.4 Discussion

Overall, this study indicates that the differences in level of exposure to elephants is significant in influencing school children’s perception of elephants and their conservation. With regards to location, school children feared elephants where elephants were native, and students who feared elephants in an area where they were not present were less likely to want to see elephants in the wild. The importance of elephants to the ecosystems they inhabit was only recognized by school children in Kenya. This study showed that there was a distinct misunderstanding of how elephants benefit other species as well as their feeding behaviours. School children from all levels of exposure were able to identify an elephant correctly. The perception that elephants were in decline due to too many species in one place, was prevalent throughout school children in South Africa. It was also determined that a wildlife guide as a career choice was not valued as highly compared to

other career choices. The emergent insights and issues are summed up as follows, with suggestive measures of improvement of awareness of elephant conservation for each concept:

***5.4.1 Do school children from all countries perceive elephants as a threat or something they want to see in the wild?***

The level at which school children from different levels of exposure feared elephants and whether that impacted their desire to see elephants in the wild was identified. The study site in South Africa represented an area where HEC is present, due to the proximity of a wildlife reserve (Karongwe Private Game Reserve) to the school. HEC is a complex and pervasive problem which is heightened when elephants share the same habitat and often compete for the same resources as humans (Parker, 2007), largely driven by conflict for the same space due to habitat fragmentation and land use change (Perera, 2009). HEC is not a pertinent issue in the study site in Kenya or England, but the demographic may be aware of these issues through environmental education practises.

Even though the issue of HEC was prevalent in South Africa, only a small proportion of respondents recognised that elephants could damage crops in this respect. Attitudes of fear of elephants was predominantly due to their ability to harm people and owing to their size across all levels of exposure. The perception that elephants can harm people, could be largely driven by anecdotal evidence from family members in countries where elephants are indigenous (Okello et al., 2014; Stormer et al., 2019), and driven by environmental programmes in countries where elephants are not present. In locations where elephants were indigenous, there were no associations to their desire of wanting to see elephants in the wild. However, school children in England who feared elephants were less likely to want to see them in the wild. Therefore, environmental education practises on elephant conservation should target fear responses in children, as the

perception that elephants can harm people could be a motivating factor for not wanting to conserve this species.

#### ***5.4.2 Do school children recognise the importance of elephants within ecosystems?***

African elephants are essential for many flora and fauna species within ecosystems, including the people that live amongst them (Western, 1989; Brooks et al., 1983). They play a key, ecological role in maintaining the linkages in a food web and their extinction would cause a cascade of change in ecosystems (Western, 1989). Elephants are also important agents of seed dispersal, increasing habitat mosaic and diversifying mammalian communities (Campos-Arceiz and Blake, 2011; Bunney et al., 2017). Not only are they important environmentally, but they are also economically important (see Chapter 1). Elephants are crucial for wildlife tourism as they are key species that tourists want to see, which promotes wildlife tourism in areas with elephant's presence and provide career opportunities in this sector. This was recognised by children in Kenya, but not as valued in South Africa. A small percentage of school children in England determined that elephants are important due to their tourism potential.

The study has shown how children living within a country where elephants are indigenous value elephant's potential for tourism greater than school children who live next to a protected area. This is concerning as the situation of people living next to protected areas and lack of understanding of conservation are key challenges facing wildlife protection, which can be addressed through job creation (McDuff and Jacobson, 2000). Additionally, it was identified that the proportion of students living near a wildlife reserve believed that elephants were important because of their tusks. Local communities need improved education, so that people's livelihoods are in some way

connected with wildlife. Ideally, there should be a drive towards local community living next to wildlife conservation areas becoming future experts on conserving wildlife.

Results also show that biodiversity is recognised as an important factor when considering the importance of elephants. However, across all levels of exposure, there was a distinct misunderstanding that elephants protect other animals, and furthermore in England and South Africa, participants thought that elephants were important due to their ability to spray water on other animals and vegetation. This was also matched in their understanding of what elephants eat, where a large proportion of respondents thought that elephants consume trees and grasses independently, and some even thought that elephants consume other small animals across all levels of exposure. Added to this, most students in South Africa and a significant proportion of students in Kenya were not aware that elephants damage trees. However, unless students are taught that elephants are mixed feeders, responses from this answer will likely be driven by any pictures of elephant's respondents have seen and the environment that elephants are shown in. For future studies, impact should be used instead of 'damage' as damage can create bias towards only focussing on the negative aspects of elephant feeding behaviour.

Collectively, there is a need to improve views on elephant's role in the ecosystem across all levels of exposure. School children in England were most aware of elephant's importance due to biodiversity, but significantly less understanding was expressed by children in Kenya and South Africa. Education practises need to be tailored towards young demographics where elephants are indigenous, so that they value the role of elephants within ecosystems to gain a better understanding of their significance as a species and resultantly the need for elephant conservation.

### ***5.4.3 Can school children that have different levels of exposure to elephants identify elephants and do they perceive any threats to elephants?***

This study then assessed whether children at all levels of exposure were able to identify an elephant from two pictures that was given on the questionnaire. This as an important determinant of valuing elephant conservation, as if the participants were unable to identify the subject species, then ultimately, this connection and motivation to conserve elephants will not be valued. Even though students were able to correctly identify elephants, it is unfortunate that some people that are living next to protected areas have never had a chance to appreciate wildlife due to lack of resources. They do not have the privilege of driving a car to safely watch the wild animals. These opportunities should be encouraged for both children and adults to enhance their understanding of wildlife and value conservation practises. There is however a growing number of people from local communities becoming involved with wildlife research and conservation, with some even becoming experts.

With this, it is paramount that the ability to recognise the importance of elephant conservation must be supported with knowledge. Elephant populations have been declining in range and numbers for decades due to ivory poaching, habitat loss and land fragmentation (Lemieux and Clarke, 2009; Thouless et al., 2016). Results for school children in Kenya and England showed that the most important reason for elephant decline was due to the ivory industry. However, school children in South Africa believed that the main reason elephants were under threat was due to too many species being in one place. This opinion could be due to the location of this school, in a small village with limited access to surrounding areas, including a wildlife reserve within proximity. It is important that environmental education practises raise awareness of all threats the elephants, to design optimal strategies that enhance and foster conservation practices.

#### ***5.4.4. Do school children recognise the importance of wildlife guides as a career choice?***

Compared to other options of career choices, a wildlife guide as a career choice was not valued highly amongst other career choices. When asked what participants thought a wildlife guide does, some girls from Kenya and South Africa responded with ‘He guides and teaches the tourists’. This shows that there is a slight bias towards school children believing that wildlife guides are male, which could prevent them from valuing this as a career choice. A large proportion of students from all levels of exposure were aware of what wildlife guides do, however a large number of students believed they directly cared for the animals. As aforementioned, there is a large proportion of internationals working as wildlife guides across in both Kenya and South Africa. This career choice should also be valued and encouraged among the younger demographic, particularly girls, where working as a wildlife guide is a viable career choice.

There are limitations to this study. Only three schools were sampled which were accessible at the time, but this could be enhanced by repeating the questionnaire across different schools and age groups and across a broader spatial scale. Attitudes toward animals, which depend on factors such as the characteristics of the animals concerned (Kellert, 1983; Herzog and Burghardt, 1988; Driscoll, 1992; Eddy et al., 1993; Plous, 1993; Gunnthorsdottir, 2001; Nakajima et al, 2002). In addition, religious, socio-economic, and cultural differences can influence people’s attitudes toward animals (Kendall et al., 2006). There has been substantial research to understand public attitudes toward the conservation of wild animals (Kellert, 1980; Kellert and Dunlap, 1989). Therefore, future studies could also incorporate attitudes towards the cultural importance of elephants. In addition to this, educational workshops based on this study’s findings could be designed to improve the understanding of perceptions towards elephant conservation. A similar questionnaire could then be distributed after the workshop takes place to determine perceptions

before and after and gauge any changes in response.

A recurring theme in this study's findings was that better education practises are required to increase knowledge across young demographics both living near and living without elephants. Key concepts such as HEC should be disseminated to groups that are directly impacted by these conflicts, but this should also be delivered across groups without HEC, to improve understanding of the broader issues surrounding elephant conservation.

The perception of elephant conservation through questionnaires in this study has provided pertinent data about the comprehension of significant themes such as fear of elephants as they can cause harm, understanding elephant importance within ecosystems, and the value of a wildlife guide as a career choice. The participants revealed a varied level of understanding of elephants in general, their behaviours towards elephants and human-elephant wildlife conflict. Understanding conservation issues and the development of positive attitudes by the people towards wildlife are crucial for stakeholders (Neupane et al., 2017). In order to promote sustainable human elephant interactions, enlarging the base of stakeholders to include children and local communities should be encouraged (Taruvunga and Mushunje, 2014).