Can Zoos Use Educational Information to Increase Visitors' Pro-Conservation Behavior

Intentions Through Animal Connectedness?

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Abstract

Biodiversity loss is an ever-increasing and human-inflicted problem that humans have to target collectively. Zoos can do their part by educating their visitors about the need for more pro-conservation measures and sustainable behavior. This study evaluated the relationship between education and pro-environmental behavior intentions, with a potential moderating effect of animal connectedness, building on a growing body of prior research on pro-environmental intentions and behavior. In contrast to entertainment-focused educational information, it was expected that sustainability-focused educational information would result in increased pro-conservation behavior intentions and that animal connectedness would strengthen this relation. Participants in three conditions (sustainability-focused, entertainment-focused and control condition) were measured using an online questionnaire and educational videos in a between-groups experimental design. However, this paper merely compares the sustainability-focused with the entertainment-focused condition. A simple linear regression with a sample size of 301 was conducted. The results were not in line with the prediction that pro-conservation behavior intentions are higher associated with sustainability-focused than entertainment-focused information. Also, the prediction that animal connectedness moderates the effect of education on pro-conservation behavior intentions was not supported either. The findings suggest that solely education did not suffice to predict a change in behavior intentions. Therefore, zoos should provide visitors with emotionally salient information to provoke pro-conservation behavior intentions. Finally, future research should focus on tailoring presented information to address the population of interest more specifically.

Keywords: Conservation, Zoo, Zoo-Visitors, Sustainability, Pro-conservation behavior intentions, Pro-conservation intentions, Education, Video-Education, Animal connectedness

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Humans' actions and decisions have a tremendous negative influence on the environment and climate (Keil et al., 2015). Precisely, some of those decisions include deforestation and water pollution, which have a negative impact on animals and species diversity (Sunlu, 2003). Another root of the ongoing biodiversity loss is the tourism industry. Markedly, decisions in favor of tourism, such as mass tourism, can harm the environment tremendously (Sunlu, 2003). According to Keulartz (2015), zoos are considered tourist attractions; hence zoos can impact the environment in various ways. To illustrate, while many people appreciate seeing animals in a safe environment, some argue that these enclosures are just for human entertainment and destructive to species diversity and the environment (Keulartz, 2015). In contrast, research has shown that certain species can also be conserved because of zoos (Ballantyne et al., 2007) which introduces a controversy around zoos (Keulartz, 2015). Moreover, apart from the zoo's conservation potential, 700 million annual visitors show that zoos have reach to appeal to a large audience (Grajal, 2010). This gives zoos not only the ability but the responsibility to send a message to change people's behavior (Moss et al., 2014). For example, zoos could provide visitors with fact-based information or statistics regarding the animals exhibited. That information might inspire some zoo visitors to critically reflect and think about their own life choices and behavior in regard to animal conservation (Moss et al., 2014). Therefore, it is essential to research under which circumstances education can impact human pro-conservation behavior intentions.

Education could potentially be the gateway to raising awareness of a zoo's conservation abilities and thus change some people's minds and behavioral intentions (Taylor & Duram, 2021). However, according to a prior study, only 4 percent of zoo visitors visit the zoo for educational purposes (Ballantyne et al., 2007). This is why it is crucial to determine

other factors that would persuade visitors to act and would also encourage visitors to be interested in the factual information provided. Factual information can be a form of education that can be defined as "the process of facilitating learning or the acquisition of knowledge, skills, values, beliefs and habits" (*SDG Resources for Educators - Quality Education*, 2018). Hence, more education means more knowledge but only when the sources are reliable and trustworthy.

In times of the internet and with it an infinite source of reliable and unreliable information, it is difficult to estimate which education is good education. This has the potential to divide the population based on where they acquire their knowledge. Markedly, Drijfhout et al. (2022) found that experts in the environmental field may strongly deviate from the public's opinion when it comes to decisions regarding wildlife management. For instance, in Australia, experts realized how an overabundant koala species induces widespread tree dieback while the public associates the charismatic animal as a symbol for their country (Drijfhout et al., 2022). This example shows how some people retrieve reliable information whereas others do not, which results in disagreement. Hence, education plays a crucial role in people's decision-making processes and zoos could make trustworthy education available to the visitors.

Just as with the trustworthiness of information, the message behind the information that is transmitted can differ. For example, the presented educational information can focus on entertainment or sustainability. This is why people can have a different takeaway from the educational information presented depending on the entertainment-focused or sustainability-focused context. On the one hand, entertainment-focused information might lighten people's moods; on the other hand, sustainability-focused information might encourage people to think on a deeper level (Tribe & Booth, 2003). The impact of those different types of educational information could lead to divergent behavioral intentions. Therefore, it is crucial to determine

which type of educational information can lead to which types of behavioral intentions. This is why it is helpful to research which kind of facts elicits more changes in pro-conservation intentions to know how to influence people's behavior successfully.

In general, no matter the type of information presented, it tends to be more appealing if it not only informs but evokes an emotion (Howell et al., 2019). This is why combining factual information with a component that elicits emotions can be beneficial. Emotions come into play when zoo visitors form connections to specific zoo animals, as that would increase the chances of them caring about the respective animal (Howell et al., 2019). This is why education might spark interest in more people who are building a connection with animals because this connection serves as a motivational factor to help animals. Thus, caring about animals' future might be a factor for a possible change in conservation behavior intentions (Skibins & Powell, 2013) which is why it is important to further investigate that matter.

Caring about something can be enough of a motivator to reconsider one's general behavior intentions, which is why it is essential to find out what makes individuals care about animals. Specifically, this can be enhanced through an emotional connection that a human builds to a certain kind of animal (Skibins & Powell, 2013). This concept of connectedness can be challenging to grasp (Howell et al., 2019; Townsend & McWhirter, 2005) but it can also be imagined as a "feeling of oneness with another and empathetic concern" (Howell et al., 2019) for the animals. Findings in another study showed that this oneness strongly predicts people's willingness to help (Cialdini et al., 1997) which can be seen as a significant factor involved in pro-conservation behavior intentions. Furthermore, it was discovered which themes were associated with the connection between humans and animals the most. For example, a human-animal connection was shown to be more likely if the animal has similarities to humans, inspires emotions, is physically close to and interacts with a human in a non-verbal manner (Howell, McLeod, Coleman, 2019). A lot of those themes were

associated with charismatic megafauna. Megafauna are enormous mammals from a particular region, habitat, or geological period (Simpson et al., 1989). Thus, the findings of the studies as mentioned earlier demonstrate that humans feel particularly connected with megafauna and a possible connection can enhance helping behavior. Consequently, if educational messages were to be presented with megafauna as an example, people might connect emotionally to the animals which in turn might increase their willingness to support the conservation of the animals they connected to.

The general goal of this study is to test how zoos can make use of education in order to foster visitors' pro-conservation behavior intentions. Therefore, we aim to investigate which educational messages motivate people to set their behavior intentions in a more conservation-oriented way. To put that into context, we implement different education approaches and test their effectiveness in increasing pro-conservation behavior intentions. As mentioned above, sustainability-focused and entertainment-focused facts can function as educational messages and thus, can have a different effect on visitors' pro-conservation behavior intentions. More specifically, sustainability-focused messages can increase people's awareness of the quality of nature and the environment and why there is a need to protect it. In contrast, entertainment-focused educational information is rather pleasure-targeted and does not have to have a deeper meaning. Therefore, I expect sustainability-focused educational information to be associated with higher pro-conservation behavior intentions than entertainment-focused educational information.

Next, an emotional attachment can encourage individuals to reflect on their behavior in order to care for people or things that matter to them. To put that into context, animal connectedness can be defined as a person's emotional attachment to an animal (Skibins & Powell, 2013) and therefore, it might impact people's behavioral intentions in regard to certain animals. Additionally, a human-animal connection could motivate people to set new or

improved intentions for the future and, speaking of animals those behavior intentions could also involve pro-conservation (Skibins & Powell, 2013). This is why I also hypothesize that animal connectedness moderates the effect of education on pro-conservation behavior intentions. Thus, higher animal connectedness increases the effect of education on pro-conservation behavior intentions whereas lower conservation caring does not show a significant impact on pro-conservation behavior intentions.

Method

Participants

This study was conducted through a convenient sampling (snowball sampling technique), where the research team initially recruited family and friends through email or social media. Five hundred seventy-six people started the survey, of which 498 gave informed consent. Only participants who reliably completed the study were included in our analysis. Consequently, 229 subjects were removed from the sample. They were removed because the participants did not pass the attention check, did not complete the study, or completed the survey in less than 10 minutes which we deemed not possible. As a result, the final number of participants was 347. We did not exclude participants who failed the manipulation check because it did not prove to be a consistent measure as data showed that the participants in the control group got the manipulation wrong more than the others. For the respective analyses, participants in the control group were excluded. Therefore the final sample size was $N = 301$ with 42.5% male, 55.5% female and 2% non-binary or other and with ages ranging from 18 to 85 ($M = 36.7$, $SD = 16.2$). With 21.9% of Dutch and 41.5% of German participants, those nationalities were the majority of the sample (see Appendix A for the list of all nationalities). They were required to speak either English, Dutch or German. Additionally, the participants had to be at least 18 years old to participate in the research. There was no compensation for participation.

Design

A between-groups experiment was conducted with two experimental conditions and a control group condition. The independent variable was the level of the manipulation, presenting information in either an entertainment-focused or sustainability-focused way. The moderator variable was animal connectedness and the dependent variable was pro-conservation behavior intentions. As this study was conducted as part of a more extensive bachelor's thesis project, the specific variables of interest were chosen from a more comprehensive list of materials (see Appendix C for the list of materials used in this paper). A minimum of 134 participants was needed for this study, according to an a priori power analysis, completed with G*Power (Faul et al., 2009), with an effect size of $f^2=.10$, power of .81, and $\alpha= .05$.

Materials

The study was conducted through Qualtrics XM. Participants were first asked to complete questionnaires regarding their demographics (age, gender, nationality). After filling out the pre-manipulation measures, participants had to watch a 4:27 minute-long video (taken from Leipzig zoo) of Siberian tigers or Panthera tigris altaica playing in a zoo enclosure. In the video, participants in the experimental groups were given different information about tigers, intended to activate either entertainment-focused or sustainability-focused thoughts in the subjects. The entertainment-focused group was presented with ten fun facts about tigers in the wild and the zoo (see Appendix B). The facts consisted of information such as "A tiger's roar can be heard about 3 kilometers away". The sustainability-focused group saw ten statements, focusing on tiger habitats, endangerment and conservation efforts (see Appendix B). The information presented for this group consisted of facts such as "Non-sustainable palm oil production is destroying tiger habitats in Indonesia and threatening the tiger population". The control group watched the video without any additional information.

Following the manipulation, the participants were asked to complete a questionnaire measuring their **conservation caring** (Skibins & Powell, 2013; α = 0.93) which was on a 9-point scale from strongly disagree to strongly agree. Precisely, the first part of the scale (questions one to eleven) which targeted care and concern for species was used to examine **animal connectedness** ($M = 4.67$, $SD = 1.62$) whereas the second part of the scale (questions twelve until twenty-one) focused on people's behavior orientations which is why we used it to evaluate the participants' **pro-conservation behavior intentions** ($M = 4.04$, $SD = 1.50$). For example, a statement that is included is "I would write a letter/sign a petition to a government official supporting the protection of this species".

As an attention check, we added an item to the conservation caring scale, where we asked the participants to click "agree". Additionally, (after the manipulation) we set up a manipulation check, asking participants to select out of three facts the one they just saw in the video.

Procedure

After receiving approval from the ethical committee of the University of Groningen, the link to the study was distributed to participants by the research team. Then participants received information about the study and gave informed consent to their participation. After choosing their language, they completed the pre-manipulation questionnaire including demographics, values and beliefs. However, values and beliefs are part of the larger research project but they are not targeted in this research paper. Following that, Qualtrics randomly assigned subjects to one of the manipulation conditions; after which the post-manipulation questionnaire was filled out, including animal connectedness and pro-conservation behavior intentions. Completing the study took participants approximately 20-30 minutes.

<center>**Results**</center>

This study examined whether higher pro-conservation behavior intentions were associated with a sustainability-focused or an entertainment-focused presentation of

education. Moreover, it tested whether the level of pro-conservation behavior intentions was positively correlated with animal connectedness. Precisely, it explored whether animal connectedness moderates the effect of sustainable education on pro-conservation behavior intentions. SPSS (Version 27) and the add-on PROCESS model were used to perform a linear regression analysis to test both hypotheses.

First of all, assumption checks for a linear regression found that linearity was not violated because the Normal P-P Plot indicated a linear relationship (see Appendix D, Figure 1). Second, this plot and the histogram of the residuals (see Appendix D, Figure 2) appeared to be approximately normally distributed, hence the normality assumption was met. Third, in light of the visual assessment of the scatterplot of standardized predicted values and studentized values (see Appendix D, Figure 3), the assumption of homoscedasticity was not violated either. Finally, we assumed independence of measurements because the participants were assigned to one group and informed not to complete the questionnaire more than once.

The analysis did not support the first hypothesis that predicted that pro-conservation behavior intentions are higher associated with sustainability-focused educational information than with the entertainment-focused approach. (t (3,297) = .031 , p = .976). Therefore, we did not find significant differences in pro-conservation behavior intentions between the participants in the sustainability-focused condition and the entertainment-focused condition.

Contrary to the prediction of the second hypothesis, a linear regression did not support the hypothesis that animal connectedness moderates the relationship between education and pro-conservation behavior intentions: While the ANOVA output shows that a significant amount of variance in pro-conservation behavior intentions is explained by the predictors education and animal connectedness (F (3,297) = 98.871, p < .001), the coefficients table indicates that the was no significant interaction between animal connectedness and education (t (3,297) = .241, p = .810), so no moderation effect was visible. In other words, the analysis

did not find a significant interaction effect (animal connectedness combined with education) on the participants' pro-conservation behavior intentions.

Discussion

Our study aimed to investigate how zoos can incorporate education that encourages pro-conservation behavior intentions in their visitors. Furthermore, we examined how animal connectedness could explain the effect of educational information on the visitors' intentions to engage in conservation. The first hypothesis that participants exposed to sustainability-focused educational information show more pro-conservation behavior intentions than participants in the entertainment-focused group was not supported. Additionally, the second hypothesis that the relationship between education and pro-conservation behavior intentions is moderated by animal connectedness was not backed by our findings either.

Regarding the first hypothesis, the participants in the sustainability-focused group did not show significantly more pro-conservation behavior intentions than those in the entertainment-focused group. The information zoo visitors received was presented in a relatively neutral fashion. In essence, the sustainability-focused educational information did not address the environmental problems and viable solutions in a way that participants could comprehend and alleviate them. Alternatively, Steg et al. (2019) suggest that information provision can promote behavior change when it elucidates environmental problems and ways to take action. Moreover, it should be taken into account that many people may be unaware of or unfamiliar with some environmental issues (Steg et al., 2019; Schultz, 2002). In order to overcome this knowledge deficit, it is crucial that the provided information is specific and the suggested solutions are feasible in regard to environmental problems and practical implications. Additionally, previous research states that information that is adapted to the unique characteristics of those receiving the information can encourage behavior change (Abrahamse et al., 2007; Jones et al., 2002; Steg et al., 2019). From that perspective, the

information presented in our study may have been too broad to change behavior intentions and should have been combined with direct audience-tailored approaches for change.

The results for the second hypothesis, according to which animal connectedness strengthens the association between education and pro-conservation behavior, were not significant. This could be due to the information given in the study. As it was mentioned in the introduction, animal connectedness can most likely be enhanced when people are physically close to the animals and are also able to interact with them in a non-verbal way (Howell et al., 2019). For instance, previous studies have shown a significant effect of close human-animal encounters on animal connectedness (Luebke et al., 2018). Additionally, humans appear to feel significantly more connected to animals that actively pay attention to them (Myers et al., 2004) which was not feasible through the informative video the participants were exposed to. Put briefly, the informational video shown in our study neither included physical closeness to the animal, nor non-verbal contact with the animal and thus potentially failed to stimulate animal connectedness. Consequently, an informational video that displays human-animal connections and includes emotional cues could have reached the participants on a deeper level, perhaps even similarly to a real-life human-animal encounter which was shown to be effective (Howell et al., 2019; Luebke et al., 2018).

Apart from physical closeness to and non-verbal interaction with animals, other studies found that negative emotional salience of the given information could encourage behavioral change. Precisely, Steg and De Groot (2019) found that people who are emotionally negatively impacted by certain information are more willing to change that emotional state, essentially changing their behavior in order to remove the negative emotion associated with their behavior. This idea is supported by another study, conducted by Hughes et al. (2011), in which participants were actively addressed and presented with the drastic consequences of their actions through footage of dead and injured animals, combined with

approaches for behavioral change. The given information potentially evoked emotions like guilt to cause behavioral change. Therefore, it is possible that the kind of information that was used in our study did not have enough emotional salience to evoke pro-conservation behavior intentions. To sum up, educational information can inspire positive emotions by means of physical closeness to or non-verbal contact with an animal. However, negative emotions may also be able to increase animal connectedness and, in turn, pro-conservation behavior intentions.

Our study had several strengths and limitations that should be taken into account. First of all, an online convenience sample is a very efficient technique to obtain a high number of participants in a short amount of time because it was possible to collect data from multiple continents within the time span of a week. However, a drawback of this technique may be the lack of experimental control because researchers are not able to ensure that participants are in a similar environment or mindset while participating in the study. Second of all, with a sample size of 301 participants from 26 different countries, our sample captures a vast population which on the one hand may result in good external validity but on the other hand this also means our results may not be generalizable to more specific populations (Jager et al., 2017). Third of all, offering the self-report questionnaire in multiple languages can increase ambiguity in the choice of words. Precisely, it was repeatedly reported in the feedback we received that the German word for "wild animals" was misleading because its meaning depends on the context. This can pose a threat to the consistency of the item's interpretation and can thus, decrease the study's validity, especially when only a minority of the sample is affected by it. Lastly, the participants spent around twenty minutes on the questionnaire which is a fraction of one day. Therefore, it is unlikely that the content of the study would impact most participants on a long-term basis. This is why a previously mentioned study made use of follow-up emails as a reminder and reinforcement of what the participants learned which

resulted in a long-term pro-conservation effect on the participants' behavior (Hughes et al., 2011). For example, our study could have benefited from adding either a digital handout sheet with the study's key information or a digital recap of the study's content a month after the questionnaire was filled in. However, if one aims to measure actual behavior changes instead of solely a change in behavior intentions, it would be most beneficial to adopt a longitudinal design in future research which could be facilitated by email reminders.

While some argue that zoos are merely a money-making-machine, zoos have the tools and abilities to conserve species (Ballantyne et al., 2007). Nevertheless, I am questioning if zoos *should* actually keep conserving nearly extinct species because the alternative to extinction is captivity. While humans cannot know with certainty if all species would want to be saved, it is known that zoos profit financially from conserving species. One could argue that primal instincts fuel the survival mechanism (Darwin & Kebler, 1859) which could mean that animals would actually not mind living in a zoo as long as their survival is guaranteed as long as possible. Nevertheless, some types of zoo animals are inherently rooted to live in freedom rather than in captivity (Keulartz, 2015). From that perspective, ensuring the species' conservation by capturing it would threaten the animal's core need to be independent irrespective of extinction risks.

Taking into account their special need for independence, if wild animals were forbidden in zoos whereas other species are allowed, it would still be challenging to determine where to draw the line. As mentioned in the introduction, this controversy represents an ethical dilemma which warrants further investigation for future generations of humans and animals. Overall, it would be relevany to identify which animals are kept in zoos solely for financial gain rather than for environmental aspects. Therefore, future research should on the one hand determine which species (for example wild animals) definitely suffer too much from being captivated in zoos. On the other hand, researchers should examine which species could

potentially be exhibited in zoos better than large mammals (for instance amphibia) in order to be conserved whilst still attracting visitors (Keulartz, 2015).

In summary, 25 percent of species worldwide are endangered (*The IUCN Red List of Threatened Species*, 2021), which is not only inflicted by humans but will also eventually lead to global threats to humankind. Since humans' overall behavior is crucial to ensure a decrease in biodiversity loss, our study investigated factors that were expected to increase pro-conservation behavior intentions. Zoos should use their tremendous influence to display scientific information about species. Most importantly, this information should tell people what important role in species conservation every single one of them is actually playing. In order to counteract the dilemma of the controversy regarding zoos, they should engage in significant systematic changes that are recognizable to every single visitor. Those changes could include introducing smaller animals like amphibia or reptiles in the zoo whilst explaining how they are similar to humans to facilitate animal connectedness. Finally, even though the relation between education and pro-conservation behavior intentions (alongside animal connectedness) was insignificant, future research should focus on how to successfully appeal to the public through information. Asking the right questions and addressing the essential topics may achieve actual significance, for instance by increasing the education's specificity and focusing more on appealing to people's emotions.

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Appendix A

Frequency table of participants' nationalities

		Frequency	Percent
Valid		301	100
	Albania	1	.3
	America	16	5.3
	Argentina	1	.3
	Azerbaijan	1	.3
	Basque	1	.3
	Czech Rep.	3	1
	Egypt	1	.3
	France	2	.6
	Germany	125	41.5
	Great Britain	3	1
	India	16	5.4
	Ireland	3	1
	Italy	4	1.3
	Luxembourg	1	.3
	Mauritius	1	.3
	Mexico	1	.3
	Netherlands	66	21.9
	Norway	1	.3
	Poland	1	.3
	Portugal	3	1
	Romania	1	.3
	Scotland	1	.3
	Slovakia	2	.7
	Sweden	1	.3
	Syria	3	1
	Turkey	42	13.9
	Total	301	100.0

Appendix B

Manipulation

Facts presented to the participants in the entertainment-focused condition

English Version

- Tigers have been around for a long time, about 2 million years.

- A tiger's roar can be heard about 3 kilometers away

- A tiger's urine smells like buttered popcorn

- Tigers can roar but not purr

- This zoo gives the opportunity to encounter tigers up to 10 meters close while remaining safe

- Every Wednesday, this zoo has Tiger training programs for the visitors to watch

- Twice a week, this zoo feeds the tigers by simulating a hunting act for zoo visitors to observe

- Next to the tiger exhibit, this zoo offers drinks for the visitors to enjoy while observing the tigers

German Version

- Der Urin eines Tigers riecht nach frischem Popcorn

- Das Brüllen eines Tigers kann man bis zu 3 Kilometer weit hören

- Tiger gibt es schon seit ungefähr 2 Millionen Jahren

- Tiger können brüllen aber nicht schnurren

- Dieser Zoo bietet die Möglichkeit, sich Tigern auf bis zu 10 Meter zu nähern und dennoch in Sicherheit zu sein.

- Jeden Mittwoch gibt es in diesem Zoo ein Tiger-Trainingsprogramm, bei dem die Besucher zusehen können.

- Zweimal pro Woche wird bei der Tigerfütterung eine Jagd simuliert, welche die Zoobesucher beobachten können.

- In der Nähe des Tigergeheges bietet der Zoo Getränke an, die die Besucher genießen können, während sie die Tiger beobachten.

Dutch Version

- De urine van een tijger ruikt naar (beboterde) popcorn

- De brul van een tijger kan je wel op 3 kilometer afstand horen

- Tijgers bestaan al heel lang, al ongeveer 2 miljoen jaar

- Tijgers kunnen wel brullen maar niet spinnen:

- Deze dierentuin biedt bezoekers de mogelijkheid om de tijgers op een veilige manier van slechts 10 meter afstand te bekijken

- Elke woensdag heeft deze dierentuin trainingsprogramma's met de tijgers waar bezoekers naar mogen kijken

- Twee keer per week krijgen de tijgers te eten door het simuleren van een jacht waar de bezoekers naar mogen kijken

- Deze dierentuin biedt drankjes aan voor de bezoekers om van te genieten tijdens het kijken naar de tijgers

Facts presented to the participants in the sustainability-focused condition

English Version

- Non-sustainable palm oil production is destroying tiger habitats in Indonesia and threatening the tiger population

- Siberian tigers live in forests mostly untouched by humans. Out of all tiger species, their home has the most complete ecosystem

- In order to conserve the habitat of one tiger, approximately 10 000 hectares of forest have to be protected.

- Tigers contribute to the health of ecosystems by keeping herbivore populations under control

- After a century of decline, Siberian tiger populations are stable or increasing in India, Nepal, Bhutan, Russia and China.

- Siberian tiger habitats consist of different forests and taiga.

- The zoo featured in this video is part of an international community of zoos running cooperative breeding programs throughout Europe

- There are currently 287 Siberian tigers in the European breeding program, providing opportunities for research and vet training

- This zoo donates to the International Union for Conservation of Nature tiger protection program, which has increased tiger populations on project sites by 40%

- This zoo teaches visitors about the threats tigers face and how everyone can help

- This zoo's breeding program leads to higher birth rates, gene diversity, and cub survival

German Version

- Sibirische Tiger leben in vom Menschen weitgehend unberührten Wäldern. Im Vergleich zu anderen Tigerarten hat das Zuhause der sibirischen Tiger das vollständigste Ökosystem.

- Um den Lebensraum eines einzigen Tigers zu erhalten, müssen etwa 10 000 Hektar Wald geschützt werden.

- Tiger unterstützen die Gesundheit des Ökosystems, indem sie dazu beitragen die Population von Pflanzenfressern kontrollieren

- Nach einem Jahrhundert des Rückgangs sind die Populationen des Sibirischen Tigers in Indien, Nepal, Bhutan, Russland und China stabil oder nehmen zu

- Derzeit befinden sich 287 sibirische Tiger im europäischen Zuchtprogramm, das Möglichkeiten für Forschung und tierärztliche Ausbildung bietet.

- Dieser Zoo spendet für das Tigerschutzprogramm der Weltnaturschutzunion, welche die Populationen in verschiedenen Projekten bereits um 40 % erhöht hat.

- Dieser Zoo informiert über die Bedrohungen denen Tiger ausgesetzt sind, und darüber, wie Besucher den Tigern helfen können.

- Das Tigerzuchtprogramm dieses Zoos führt zu einer höheren Geburtenrate, einer größeren Genvielfalt und einer höheren Überlebensrate der Jungtiere.

Dutch Version

- Siberische tijgers leven in bossen die door mensen nauwelijks zijn aangetast. Van alle tijgersoorten hebben siberische tijgers het meest complete ecosysteem

- Om de natuurlijke leefomgeving van één tijger te behouden moet ongeveer 10.000 hectare aan bos worden beschermd

- Tijgers dragen bij aan gezonde ecosystemen door de herbivoor populaties onder controle te houden

- Na een eeuw aan bedreigingen zijn siberische tijgerpopulaties stabiel of nemen ze toe in India, Nepal, Bhutan, Rusland en China

- Het europese fokprogramma heeft op dit moment 187 siberische tijgers. Het programma biedt mogelijkheden voor het opleiden van onderzoekers en dierenartsen.

- Deze dierentuin draagt financieel bij aan het International Union for Conservation of Nature tijger-beschermingsprogramma, dat de tijgerpopulaties heeft doen toenemen met 40%

- Deze dierentuin leert bezoekers over de dreigingen die tijgers ervaren en hoe iedereen hierbij kan helpen

- Het fokprogramma van deze dierentuin leidt tot hogere geboortecijfers, genetische diversiteit, en overleving van tijgerwelpjes

Appendix C

Measures

Pro-Conservation Behavior Intentions

The conservation caring scale was developed by Skibins and Powell (2013). Items twelve to twenty-one were used to assess pro-conservation intentions.

Existing connection to wildlife

1. I actively seek opportunities to view wildlife

2. I feel a deep connection to wildlife

3. I am highly motivated by the need to interact with wildlife

4. I spend a lot of time learning about wildlife

Conservation caring

5. Ensuring this species' survival is my highest priority

6. My emotional sense of well-being will be severely diminished by the extinction of this species

7. I need to learn everything I can about this species

8. I would protest this site if I learned of the mistreatment of this animal

9. I will alter my lifestyle to help protect this species

10. My connection to this animal has increased my connection to the species as a whole

11. Wildlife protection must be society's highest priority

Behaviour-species oriented

12. I will donate up to $75 to "adopt" this animal at this site

13. I will make a charitable contribution up to $150 to help purchase habitat in the wild for this species

14. I will become a member of an organization committed to protecting this species, within the next 6 months

15. I will volunteer at an event designed to help the conservation of this species, within the next 6 months

16. Before my visit is over, I will sign up for a mailing/email to receive updates about the care and conservation of this animal

Behaviour-biodiversity oriented

17. Even if I never return, I will provide ongoing financial support to this site

18. If asked, I would donate as much as $50 to help protect a species I've never heard of

19. I will endorse a public policy that severely restricts future growth & development in order to protect wildlife

20. Elected officials' views on wildlife will be a major factor in my voting

21. Even when they are more expensive or harder to find, I will buy groceries & products that support wildlife conservation

Appendix D

Figure 1.
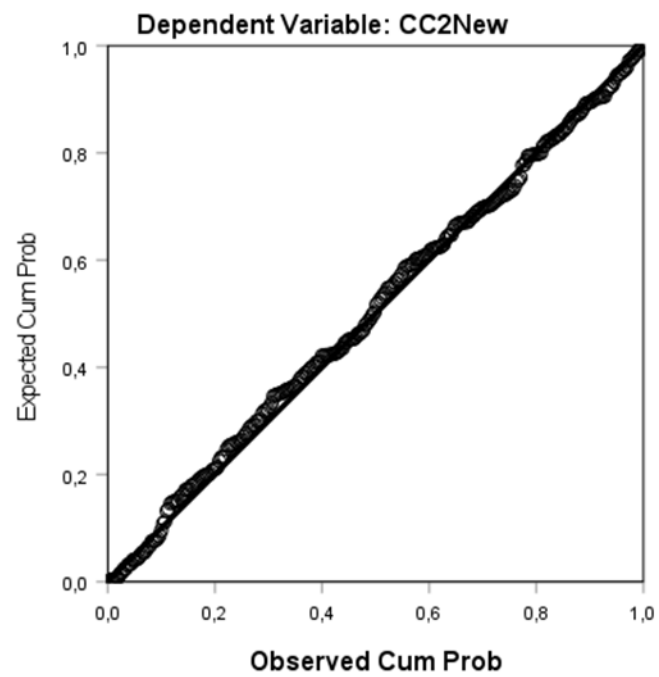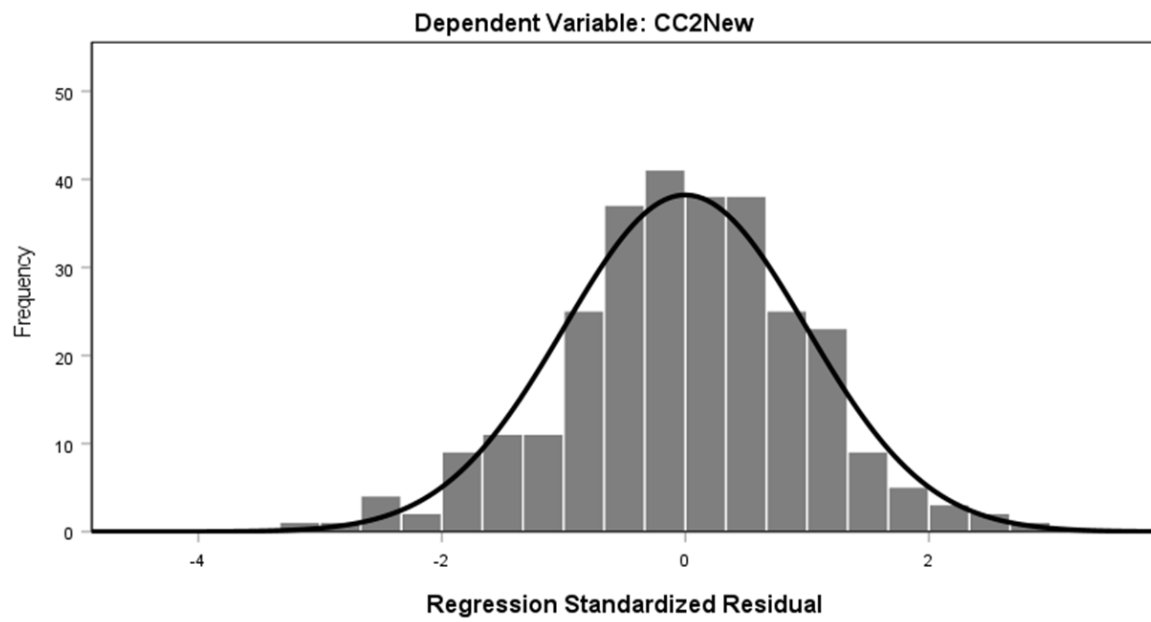
Normal P-P Plot of Regression Standardized Residual

Figure 2.

Histogram

Dependent Variable: CC2New

Figure 3.

Scatterplot

Dependent Variable: CC2New