Animal cruelty and environmental education: Evaluating a school educational program to improve positive attitudes towards animals

A Research Design Proposal

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Part 1 – Cover page

The problem: Human-wildlife conflicts not only have significant direct consequences on human health and welfare, but also deteriorates psychological wellbeing. Biodiversity and the health of the ecosystem on the other hand have also suffered from human-wildlife conflict. This depreciation affected a plethora of species including the striped hyena that has been listed as "near threatened globally" by the International Union for the Conservation of Nature. Striped hyenas are Lebanon's national animal, which is where they've mostly witnessed poisoning, running over, and shooting on sight by frightened humans (New York Times, 2019). Hyenas aren't the only species witnessing injustice, horrific animal cruelty also happens very often in Lebanon to domesticated and stray animals like dogs, cats, and others.

Program: The keys to coexistence are education, communication, science, and behavior modification. As such, the program focuses on education with the aim of behavior modification (Kellert S. R., 1984). In other words, it is to assist children between the ages of 10 and 12 years old in developing compassion and positive attitudes towards animals. People & Animals (Savesky, & Malcarne, V. 1981), A Humane Education Curriculum Guide developed by the National Association for Humane and Environmental Education is used. Instead of adding a class to the already existing classes, the guides will blend with the existing courses namely math, social studies, language arts, health & sciences. Activities such as role playing, creative writing, readings, storytelling, photographs, and watching animal-related television programs are included in the program. The "farm animals" section of the curriculum is not used in this study. Both, non-message-based approaches (pet animals), and message-based approaches (wild-animals) will be used. There will be a focus on the aspects of animals that are most salient and relatable to the children.

Program theory: Recent studies have shown that environmental education should go beyond just the facts because knowledge and attitudes have a very low correlation; thus, mere knowledge does not promote compassion and positive attitudes (Morgan and Gramann, 1989, LaHart 1978.) The National Association for Humane and Environmental Education's curriculum guides focus on the goal of "assisting children in developing compassion, a sense of justice, and a respect for all living things" (Ascione, F.R. 1992), making it a perfect fit for our intended outcome. Lastly, the ages 10 to 12 years old were chosen because several researchers suggested that it is between these ages that the person is actively seeking knowledge to form attitudes towards animals which is exactly when the right intervention would be mostly impactful (Westervelt & Llewellyn, 1985).

The dependent variable in the study: The primary outcome of interest is positive attitudes towards animals.

Program inclusion criteria: Students between the ages of 10-12 years old in schools within and around the Jabal Moussa, Kesserouan area – one of the stiped hyenas preferred habitat – are eligible to participate. Number of participants is limited to the resource capacity namely conservationist trainers. The cap is 500 participants. Students must have similar, non-impeded cognitive and affective abilities, else, they will be excluded from the study.

Motivation of the Study: United nations partners are proposing to provide $2 million worth of funds over ten years to approved awareness and educational campaigns to reduce animal cruelty and human-wildlife conflicts for the conservation of biodiversity. Strong evidence is needed for program effectiveness before this kind of support is provided.

Part 2 – Outcome Measure

A) Identification and justification of appropriate latent construct

Attitudes towards animals is the latent construct we aim to examine. Attitudes isn't a quantitative measure that is easily examined. It isn't tangible; it's more conceptual and really hard to measure thus is considered a latent construct. Attitude is defined as "a settled way of thinking or feeling about something". It is an appropriate outcome for the study because positive attitudes towards animals nurtures coexistence and limits violence.

B) Valid and reliable instrument used to measure attitudes towards animals

The valid and reliable instrument that will be used to measure attitudes is the Animal Attitudes Scale. The explanation of the instrument development process "Analyzing Human-Animal Relationship Measures" is published in the peer-reviewed journal "Anthrozoös" 2:4, 236-244, by Robert H. Poresky (1989), DOI: 10.2752/089279389787057911

The reported Cronbach Alpha is about 0.9 (0.88 to be exact). The survey includes 20 questions regarding the use of animals which may be answered on a 5 Linkert scale as follows: **5** = Strongly Agree (SA); **4 =** Agree (A); **3** = Undecided (U); **2** = Disagree (D); **1** = Strongly Disagree (SD)

High scores indicate pro-animal welfare attitudes and items marked with ** are reverse-worded. Meaning a 5 is actually considered a 1, a 4 is a 2 and vice versa. Here's an example of one of the questions: Too much fuss is made over the welfare of animals these days when there are many human problems that need to be solved. SA A U D SD**

We will be using the short version of the scale (a 5-item version as opposed to 20 items) to measure the one-year outcome post completion of the program. It correlates highly with the full 20 item scale (r's > .95) and has good reliability. The short version development process is explained in "Brief Measures of

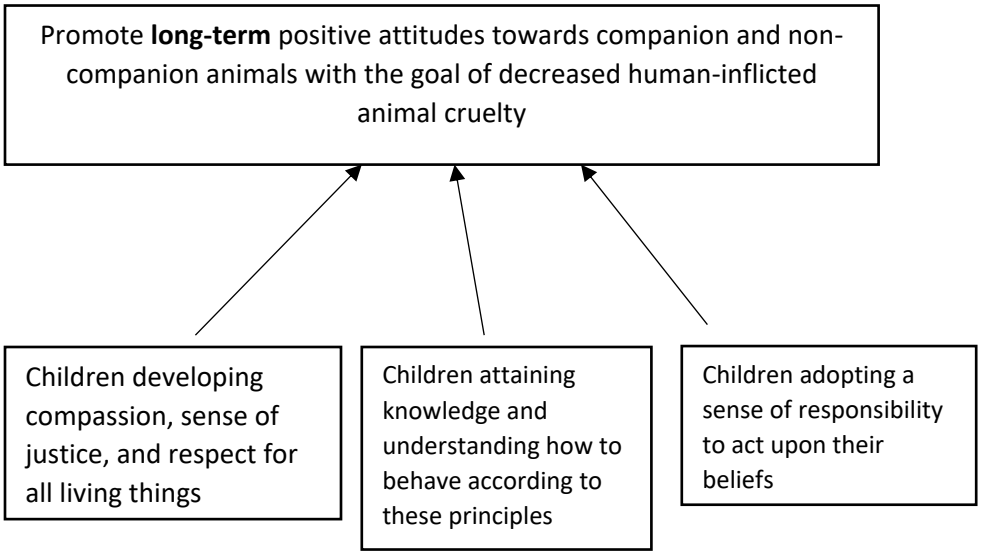
the Animal Attitude Scale" also published in the journal "Anthrozoös" by Harold Herzog, Stephanie Grayson & David McCord in 2015; volume 28, issue 1, pages 145-152, DOI: 10.2752/089279315X14129350721894

Part 3 – Theory of Change

A) Identifying long-term goals & Assumptions

The study's focus stems from the excessive human-animal conflicts and cruelty that have risen especially after the economic deterioration in Lebanon.

a. Long-term and intermediate goals



b. Assumptions

The intermediate goals act as prerequisites leading up to the long-term goals. Developing a connection with animals, knowing how to behave, then actually feeling responsible to act rightfully improve the likelihood of behavior change towards affirmed positive attitudes.

For the outcome: “Children developing compassion, sense of justice, and respect for all living things”, the assumption is:

Assumption 1: Children need more than just knowledge and awareness of the importance of animals in the ecosystem to advocate against animal cruelty; they need to develop a connection with animals which nurtures compassion, respect, and the sense of justice. It is more efficient to direct children towards positive attitudes as opposed directing adults, since beliefs haven’t been rooted yet.

For the outcome: “Children attaining knowledge and understanding of how to behave according to these principles”, the assumption is:

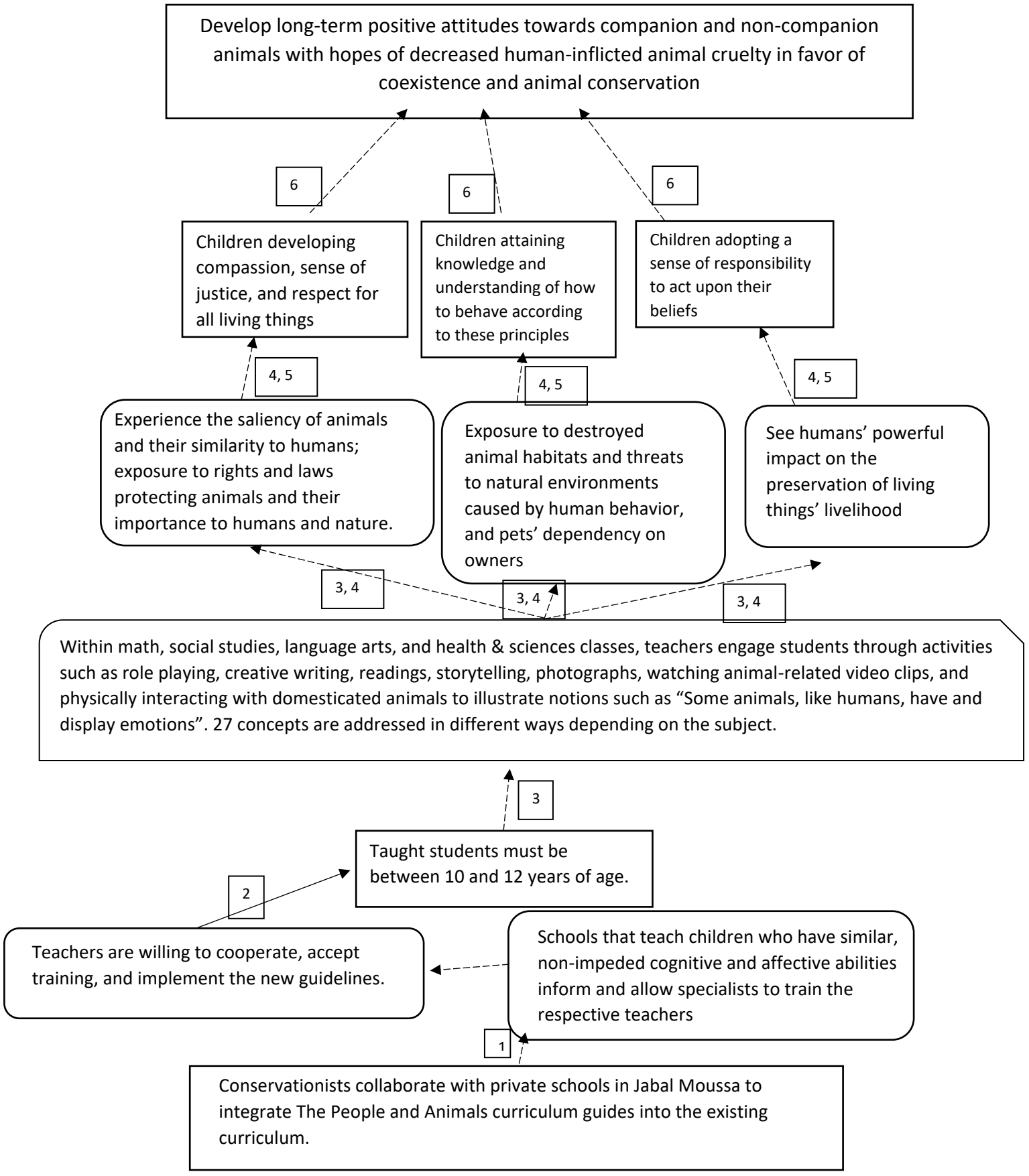
Assumption 2: Developing compassion is a prerequisite that is complimented by knowing how to act and behave with compassion.

Lastly, for the outcome: “Children adopting a sense of responsibility to act upon their beliefs”, the assumption is:

Assumption 3: It’s one thing having compassion and the feeling of respect towards animals, however, it’s another thing to not feel responsible to act upon personal beliefs. Having a sense of responsibility to act accordingly is the final needed step that improves the likelihood of behavior change.

These assumptions clarify why and how this program is different from traditional awareness and educational programs.

B) Backward mapping and connecting outcomes



C) Interventions (numbers on diagram above)

1. Conservationists are trained professionals and experts in The National Association for Humane and Environmental Education's curriculum guides who have pre-researched schools' contact details
2. Teachers are capable of understanding and applying the new curriculum and methods of teaching
3. Non-message-based activities were coordinated and arranged with the respective destinations (zoos, shelters etc.)
4. Students do not miss classes often and are actively engaged in the activities
5. Children absorb and understand what they are learning
6. Participants apply what they learned

Part 4 – Model and Competing Hypotheses

A) Counterfactual

1. Treatment group

The treatment groups would be children enrolled in the schools that agreed to take part in the program. The control and treatment groups will be chosen randomly (randomization process – lottery for seats).

The schools that qualify for the program are within the Jabal Moussa Biosphere, Kesserouan area. The typical participant is 10 to 12 years old child, registered in one of the above-mentioned schools and has non-impeded cognitive and affirmative abilities.

2. Ideal Counterfactual

Ideally, the counterfactual will be T1 + (C2-C1); it would represent what the world would have looked like if the program had not been implemented. The counterfactual is T1 + secular trends and excluding the intervention (treatment activity). See “CF” in the diagram below. Important notice: the treatment and

control groups would only differ in whether or not they underwent the treatment. We will be testing for group equivalence using a table of contrasts to ensure that randomization was “happy”.

3. Control group

The control groups are the schools that agreed to participate in the program but were not selected (randomly) to take part in the treatment. The study will consider multiple schools with similar characteristics (namely ethnicity, race, sex, age**,** education level, region**,** social class), then control for possible organizational differences (financial health/teacher pay, resources, class size etc.) (Quasi-experiment). Since the school had already agreed to participate in the program, then data may be collected and outcomes may be observed. They will not receive the curriculum guides, neither the training to apply it before the end of the program.

B) Study Timeframe

The study timeframe is approximately 2 years. Our treatment will last one academic year, and there will be an evaluation of attitudes one-year post-treatment.

Studies have shown that the implementation of the People and Animals curriculum guide for one academic year showed durable improvements in positive attitudes (Ascione, F. R. 1992). The positive effects of the People and Animals intervention remained intact two years past the completion of the program. The improvement in attitudes toward animals even extended to human-directed empathy at the Year 1 and Year 2 post testing (Ascione, F. R., & Weber, C. V., 1996). Additionally, several other studies suggest that humane education has a positive influence on children's development in prosocial conduct and empathy, and the effect can persist for 6 to 18 months (Evans, R., Murphy, S. & Scourfield, J. 2015).

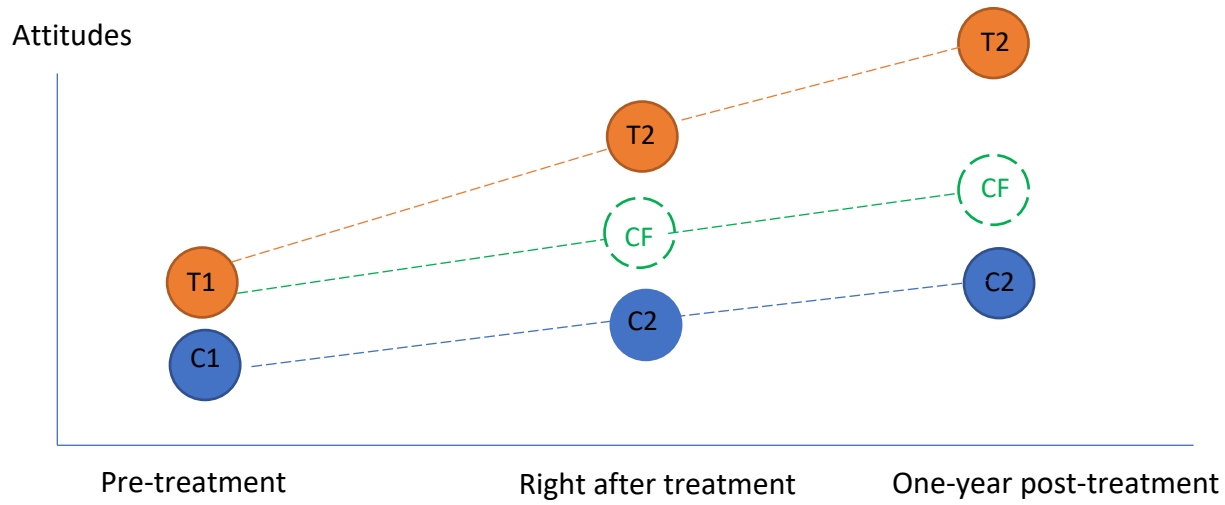
Note: Attitudes take time to formulate; the costs of a shorter time-frame of the treatment is not having enough time to guide the children to have warmer attitudes towards animals. On the other hand, a longer

time-frame (one-year post-treatment) may face a problem of non-random attrition and budget constraints.

C) Diagram of Expectations

We will be using the pre-test post-test with comparison design because secular trends are expected (C2 is not equal to C1) and T1 is not expected to be equal to C1 either since there could be a possibility that different schools with varied socio-economic status, geography, teachers' influence etc. could show a difference between the two groups.

Ideally, the program would look like this:



For the estimator [(T2-T1) – (C2-C1)] to be valid, the assumption that "the comparison group measures the changes we would expect to observe in the treatment group over time independent of the treatment" must be met (a test of group equivalence will be conduct as previously mentioned).

We could expect secular trends in the study as we do know with certainty that maturation and/or other correlated variables (competing hypotheses) may exist. The children at the age of 10-12 are in the processes of forming beliefs and attitudes towards animals; therefore, there could be changes

independent of the program such as parents' influences, personal experiences, natural changes caused by maturity/puberty etc. The study uses a control group and randomization to control for maturation and selection biases. Note that program success means positive attitudes increase. The higher the score of positive attitudes the better the results.

D) Treatment Effects

The most appropriate estimate for the study is Intention to Treat (ITT) since there is no way to measure non-compliance. The treatment is given through the day-to-day regular classes at school. It is either the student attends classes or not in which case they'd either be in the control group or dropped out of the study.

E) Justification of Proposed Design – Literature Review

We will mimic – to a certain extent – Ascione's 1992 study design but use a much better measurement instrument with a higher Cronbach Alpha. The other studies allowed us to consider multiple measuring tools to avoid testing bias and apply two periods to test durability.

The three studies that assisted in formulating our proposed design are explained below.

1. Morgan, J. M., & Gramann, J. H. (1989). Predicting Effectiveness of Wildlife Education Programs: A Study of Students' Attitudes and Knowledge toward Snakes

The program was a field experiment with a 2 x 4 factorial design, 7 distinct treatments, and 1 control group. The amount of information that was given to children about snakes and the level of involvement that students had with live specimens were the two educational components that were systematically modified by this design.

The table below summarizes both factors.

	Level of involvement			
Amount of information	None	Mere exposure	Mere exposure and modeling	Mere exposure, modeling, and direct contact
No slide show	5.63	5.7	6.5	6.37
Slide show	5.88	5.95	6.04	6.71

*Scores ranged from 1 (most negative) to 9 (most favorable).

This program's main objective was to refute widespread misconceptions regarding snakes.

The reflexive design was used (T2-T1) because it is expected that there is no change outside of the treatment. The outcomes were measured using a semantic differential that was designed and pre-tested to assess students' attitudes about snakes. This scale had five scale items, each of which was anchored by a pair of opposing adjectives along a nine-point scale 1 (the worst) to 9 (most favorable). The test's reliability (Cronbach's alpha) was 0.95. The same pupils were also given a knowledge test on snakes that had 24 multiple-choice questions. The reliability score for the knowledge test was 0.77.

2. Ascione, F. R. (1992). Enhancing children's attitudes about the humane treatment of animals: Generalization to human-directed empathy

The treatment implemented was based on the NAHEE curriculum guides. Teachers in the treatment group were expected to dedicate at least 40 hours of classroom instruction based on the guides during the academic year.

The study used a pretest-posttest with comparison design with 16 classrooms randomly assigned to an experimental group and another 16 assigned to a control group.

Four instruments were used to measure outcomes:

a) A questionnaire assessing children’s experience with companion animals and other animal-related settings (example: zoos)
b) Primary Attitude Scale (PAS). Cronbach alpha: 0.63.

c) Intermediate Attitude Scale (IAS). Cronbach alpha: 0.69
d) Empathy Index. Coefficient alphas were range from .54 to .79; both convergent and discriminant validity have been demonstrated (Bryant 1982).

3. White, Eberstein, K., & Scott, D. M. (2018). Birds in the playground: Evaluating the effectiveness of an urban environmental education project in enhancing school children's awareness, knowledge and attitudes towards local wildlife.

"Bird Buddies" - a UK-based environmental education project designed for urban primary school children aged 7–10 was the program that was being evaluated. It is a six-week bird-feeding and monitoring initiative within schools. The project's main objectives were to provide kids the chance to interact with nature, teach them about and cherish local biodiversity, monitor animals, and demonstrate how they can improve their surroundings.

The pre-test post-test only randomized controlled trial design was used because it is expected that there is no change outside of the treatment. (Reflexive design)

A structured questionnaire developed by the researchers themselves was used to assess participating children's pre-project. Participants responded to a post-project survey that was comparable in content and format to the pre-project survey in order to gauge changes in knowledge of and attitudes toward birds (Cronbach's alpha was 0.85). A nine-item, semi-structured project evaluation survey was emailed to the lead teachers right after the project (Cronbach's alpha 0.74). A brief online survey was given to each participating teacher one year after the project's termination to find out if their class or school was still feeding or monitoring birds, and if so, how much and what kind of activity was involved.

F) Threats to Validity

- Selection +1

Since the schools choose whether or not to take part in the program it means they are more prone to address the children towards positive attitudes, but it does not mean that the students themselves are more prone to have positive attitudes. The children's attitudes remain completely random using lottery/randomization techniques. Furthermore, the study is prone to omitted variable bias if other factors that may affect positive attitudes are not taken into consideration. These include parent's attitudes and influence, personal experience and more. The study controls for these factors to ensure selection bias does not occur.

- Non-random attrition +1

At the time of post-testing, attrition may occur for the reasons of moving to other classrooms or schools or even because they were repeatedly absent during the post-testing phase of the study. The study shall examine characteristics of those that stay versus those that leave. We wouldn't expect a large number of participants to leave the study unless in the case of extreme intervening events which would bias our study. In the non-extreme sense, participants are likely to leave the treatment and control groups at equal rates.

- Maturation +0

Maturation is expected as we are examining children who are in the process of developing and mentally maturing. Natural improvements (or deterioration) of positive attitudes are highly plausible especially in a span of 2 years. A comparison group is used to remove the trend but it remains tricky to differentiate.

- Secular trends +1

Not applicable in this case. Generally, macroeconomic occurrences do not interfere with attitudes towards animals.

- Study time-frame (how do you know it's long enough?) +1

The time-frame of the study is backed by previous research which indicates that positive attitudes may remain intact for 6 to 18 months. Furthermore, our program is built on a 1-year curriculum guide that has been rigorously tested and proven to be effective in previous studies.

- Testing +1/+0

This may be something to be careful of since we will be using similar questionnaires 3 times. The first is during pre-testing, the second is right after the completion of the treatment and the last is 1 year after the program finalization. The first two use the same questionnaire and the third is a summarized version of the first. It could be a cause of concern, however, there is a 1-year gap between each administering of the questionnaire. This could be enough to avoid testing bias.

- Regression to the mean +1

This could be an issue should the treatment group have severely low positive attitudes to begin with. However, the study specifically targets an age group that generally remain in the process of formulating attitudes meaning they are not likely to have established extreme attitudes just yet.

- Seasonality +1

Not applicable in this case. The study occurs throughout the full academic year.

- Intervening events +0/+1

There might be intervening events that are out of the researcher's control such as the closing of one school that is either part of the control or treatment groups. Lebanon is going through dire economic times which may lead to major cuts in teachers, resources, or even closure of schools.

- Measurement error +1

We use highly reliable instruments with a Cronbach alpha of 0.9.

Other implementation challenges may be the possibility that the study isn't externally valid. The samples are taken from 1 district that is highly prone to wildlife encounters in general due to the close proximity of wildlife and human habitats. The sample may not be indicative of the general public.

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