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Sixth graders' attitudes about wild animals

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SIXTH GRADERS' ATTITUDES ABOUT WILD ANIMALS

by

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Sixth-grade students from three western Montana school districts were surveyed in an effort to gain an understanding of their attitudes about wild animals. Students' attitudes were analyzed based on gender and whether they lived in a rural or town setting in order to determine if there were differences in attitudes corresponding to these characteristics.

The survey consisted of three short stories depicting dilemmas involving wild animals and human beings, each followed by a set of three questions. Students were asked to provide written responses to the questions explaining what course of action they would take and why. The responses were analyzed based, in part, on a modification of Kellert's (1985) typology of attitudes. Several interesting differences were noted corresponding to both gender and rural or town residency.

Differences included the fact that girls in the study group expressed a higher percentage of ethically-based attitudes and negative attitudes than did boys. Boys and rural students expressed a higher percentage of utilitarian attitudes, and rural students also expressed a lower percentage of legalistic attitudes than did the rest of the study group.

In addition, student responses were analyzed based on a modification of Gilligan's (1982) concept of "connectedness" in perceiving relationships and interactions. Girls in the sample expressed feelings of connectedness with the animals depicted in the stories more frequently than did the boys.

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CHAPTER 1
INTRODUCTION

In order to develop teaching approaches that more effectively foster strong environmental attitudes and values, the teaching community needs to know how students perceive themselves and the environment in which they live. Without this baseline knowledge, any programs developed will be, at best, educated guesses about what development needs to take place in children's environmental values, and which approaches will be most effective in encouraging this development.

Knapp (1973) stressed the need for good instruments to assess environmental attitudes of elementary and secondary students. Several surveys have been developed to assess environmental attitudes of junior high school, high school, and college-age students (Bowman, 1974; Dyar, 1975; Pomerantz, 1977; Kellert and Westervelt, 1985).

This study is distinct from these past studies not only in its geographic scope and its focus on the sixth-grade level but also because it elicits student responses in an open format, rather than in a traditional questionnaire format. The open response format allows a new perspective on student attitudes and may bring to light attitudes that were not previously anticipated by researchers.

The topic of wild animals was chosen as a basis for this study, because it is a topic which is easily understood by students, and one that should stimulate clear expression of attitudes and values with respect to the ecosystem. How children perceive the value of other creatures in the environment and their responsibility to these creatures is a central issue in environmental concern.

Purpose and Need

Information collected in this investigation will be useful to educators and researchers in several different ways. First, by knowing how students perceive wildlife issues, teachers should be able to develop better educational approaches that children in this age group can relate to and understand. Educators could, for example, take advantage of strong scientific attitudes by developing a unit on environmental problems which approaches the problems from a scientific point of view.

Another way in which this study could be useful is in identifying "problem" areas in the general attitudes of this age group. For example, the study indicates that students at this age may not be as concerned with the ecological implications of wildlife issues as some teachers may feel is satisfactory, consequently teachers and administrators could choose to foster the development of ecological concerns in their approaches in studying the environment. This, of course, requires a value judgment on the part of the teacher as to what is a "good" attitude and what is not. Educators are influential in helping students to develop values and attitudes, and it would be unrealistic to assume that they could discharge their duties without making these judgments. The information provided by this study will allow educators to be more aware of aspects of their students' attitudes that could be strengthened (or weakened, as may be the case with negative attitudes).

Also, because gender and other demographic factors appear to be important with respect to attitudes, educators can use that informa-

tion to adjust their educational approaches to relate better to all types of students.

Thesis Statement

Sixth-grade students in West central Montana have attitudes about wild animals which may vary depending upon gender, and residency in rural or town settings. Generalizations can be drawn and distinctions made with respect to their attitudes and the demographic characteristics mentioned above.

Attitudes and Values Defined

Knapp (1973, p. 26) provided reasonable definitions of attitudes and values which were used as guides in the process of choosing stories for this instrument. An attitude is defined as "a person's favorable or unfavorable expression toward a class of objects or events." In other words, an attitude is an opinion expressed with regard to a certain situation. It does not necessarily dictate how a person will act, but only how he or she perceives a hypothetical situation.

A value, on the other hand, is defined as "a guiding force that determines the choices people make in living their life." A value, then, involves not only an opinion about a particular set of circumstances, but also a commitment to act in a way that supports that opinion. This implies a deeper conviction regarding an issue than does an attitude.

Certainly one would expect to be able to identify more easily attitudes than actual values in any age group, especially in

children as young as those involved in this study. The distinction between attitudes and values cannot be made in the context of this study.

The minds of children in this age group provide fertile ground for fostering the development of constructive attitudes and values because they may not be far along in the process of "hardening" attitudes and values. That is why it is important to study this age group in particular; educators need baseline information in order to facilitate the development of constructive attitudes and values.

CHAPTER 2
METHOD OF INVESTIGATION

In the course of this study an instrument was developed to assess sixth-grade students' attitudes about wild animals. The instrument consists of three short stories containing elements of moral dilemma, and several questions pertaining to the stories to which students were asked to respond. Students were allowed to respond as little or as much as they wished in these open questions. The stories and questions were designed to bring out ideas the students may have about wildlife and its place in the ecosystem as well as what the students believe their own place and obligations are with respect to wildlife.

Sixth-grade students were targeted for this study after consideration of the general intellectual capabilities of this age level, and after consultation with an experienced middle school teacher. Students at this level are generally able to conceptualize well (Inhelder & Piaget, 1958) so they were able to understand the questions and make valid responses.

An important challenge faced in developing this instrument was to avoid leading students to any particular conclusion. At this age children are particularly sensitive to finding the "right" answers to questions; answers that will please their teachers and other adults. Using an instrument which elicits student responses to stories helped to minimize this problem because this format does not correspond to the format of a conventional test. The construction and administration of this instrument was designed to encourage students to express freely their impressions of the stories and any ideas generated by them. In the process of developing this

instrument, a pilot study involving a small number of sixth-grade respondents was used to check for clarity and validity of the items. Once the pilot study was satisfactorily completed and the instrument had been approved by the thesis committee, approval was sought from Missoula School District One, as well as the Superior and Alberton, Montana school districts, for administration to sixth-grade classes. There was only one sixth-grade class each in Superior and Alberton. Two Missoula schools were chosen based on the recommendation of Missoula School District One's Director of Curriculum and Instruction in an attempt to administer the survey to a representative sample of Missoula sixth graders.

After consulting with the district administrators and teachers, a decision was made to administer the survey to each class as a whole and ask for written responses. The total sample consisted of 103 students.

Administration of the Survey

Arrangements were made with the teachers from each class to meet with their classes for about 45 minutes at a time convenient for them. All classes were surveyed personally by the author. Upon entering each classroom I identified myself as a student at the University of Montana who was interested in finding out how sixth graders felt about some issues. The students were then told that some stories and questions would be handed out and that we would read through them aloud one at a time, waiting after each story for everyone to answer the questions on their survey papers corresponding to that story. They were told to wait until the next story

was read before answering the corresponding questions so that the group could go through the survey as a class. This was done to insure that all students would receive instructions immediately prior to answering the questions for each story. In this way it was possible to stress repeatedly the importance of explaining in their answers not only what they would do in each situation but why. This was important because attitudes were almost exclusively revealed by their explanations of why they would take a particular course of action.

Before beginning the story section of the survey, students were asked to identify themselves as a boy or girl by circling the appropriate word at the top of their page (each paper was checked as it was collected to see that they had accurately identified themselves). They were also asked to identify themselves as living "in town" or "in the country" by circling the corresponding term. They were told that living "in town" meant that they lived in the town itself or in a neighborhood where they had neighbors nearby, whereas living "in the country" meant that they lived out in the surrounding area where they did not have many neighbors near them.

Before each story the students were reminded that the survey was not a test, that there were no right or wrong answers and that it was intended only to find out what they thought about the situations depicted in the stories. They were also told that they did not have to put their names on their papers. Students were encouraged to ask questions if any part of the instructions or survey was unclear.

After the introduction, each story and the corresponding questions were read aloud, and students were instructed to write their answers to the questions on the survey sheet, using the back if they needed more space. They were told that they could draw pictures on the back of the survey sheet if they finished before the rest of the class. After reading each story and corresponding questions I waited for all students to finish before going on to the subsequent stories.

When the whole class had finished all the stories and questions, the papers were collected. At that time I initiated a discussion about the stories and asked students to volunteer how they had answered the questions. The students readily volunteered answers and seemed to enjoy explaining how they had answered the questions. No new insights about their answers were gained in the discussions, but allowing the students an opportunity to share their ideas with their classmates was worthwhile nevertheless.

The Stories

Story #1

Mr. Z bought a large piece of land in the wilderness of Montana. After building a comfortable home on his land, he moved his family to Montana where they settled into their mountain hideaway, many miles from any town or settlement. After living there for several months, Mr. Z started hearing noises at night out back by his garbage bins. At first he tried to ignore the ruckus. Eventually the noise got louder and more frequent and he decided to go out and see what was going on. To his surprise he found a grizzly bear and two cubs thrashing in his trash! He tried to frighten the mother bear away, but she threatened him and chased him into the house. He barely got inside in time.

After giving the problem some thought he decided to buy a bear trap so that he could trap and kill the bear. He knows that is illegal because the grizzly bear is protected under Montana law, but he is frightened of the bears and decided that was his only solution to the problem.

Questions:

Do you think Mr. Z should trap and kill the bears?

Why or why not?

Do you like having grizzly bears living in Montana?

Why or why not?

Can you think of a better solution to this problem? If so, why do you think it is a better way to solve the problem?

Story #2

Mrs. Q lives alone in an old farmhouse just outside of town. For years she has had spiders living in her house. She has always found the spiders annoying, but this year there are even more than usual. They are making webs in her cupboards and they scare her when they skitter out from under her front porch. One morning she even found one in her shoe.

Mrs. Q has never liked spiders so she decides that she will get rid of them once and for all. A friend told her about a spray that not only kills the spiders that touch the spray, but also spreads sickness to all the spiders in the area. She knows that if she uses the spray, all the
spiders in the surrounding woods and meadows will die.

Questions:

Should she use the spray? Why or why not?

Would it matter if all the spiders in the area were killed? Why or why not?

Can you think of a better solution to this problem? If so, why do you think it is a better way to solve the problem?

Story #3

Mr. & Mrs. X want to build a wilderness ski resort in the mountains of Montana. They have some land that offers a beautiful view of the surrounding landscape, but right in the middle of the

property where they would have to locate the lodge is a big pond. The pond would have to be drained in order to build the resort. No one uses the pond, but large numbers of fish and other water creatures live and breed in the pond. There is even a group of rare fish that are close to becoming extinct.

Both Mr. & Mrs. X decide to rent a bulldozer and drain the pond so that they can build their resort.

Questions:

Do you think they should drain the pond? Why or why not?

Do you feel that the lives of the fish and other animals in the pond are important? Why or why not?

Can you think of a better solution to this problem? If so, why do you think it is a better way to solve the problem?

CHAPTER 3
METHOD OF ANALYSIS

Interpretation of the results of this survey emphasized types of attitudes expressed by children using a modified version of Kellert's (1985) attitude typology from his study of age-related development of children's attitudes toward animals. This typology served as a guide in categorizing student responses, but did not form the sole basis of analysis. After careful consideration, a typology was chosen, rather than a hierarchical scale of levels of development. Hierarchical scales imply that one attitude is either more or less advanced than another, when in fact, an attitude may simply be different from another. The assumption that we can rate attitudes in this way is not valid within the scope of this study (developing a hierarchical scale of levels of environmental attitude and values development would be a major project in itself), and could exert a negative influence on objectivity in interpreting results and their implications. The typological scale leaves these level judgments out of the construction and interpretation of the study. However, should future investigators wish to reinterpret the results based on a hierarchical arrangement of the descriptors in the typology, that option would remain open to them. Also, educators can decide if certain types of attitudes are more or less desirable to encourage in their students, and could use this instrument as a means of assessing their students' attitudes. This typology includes the following categories: naturalistic, ecological, humanistic, ethical, scientific, aesthetic, utilitarian, dominionistic, and negative (see description of each type in Chapter 4).

Attitudes expressed may not always fit into a prescribed category so unique attitudes were given full consideration. Consideration of individual attitudes was given, in part, by categorizing responses based on their main concerns, in addition to their attitude types, and by collecting interesting excerpts from many of the responses.

Background information on gender and rural or town residence of students was collected and analyzed to determine if any differences were associated with these factors. Frequency distributions of each type of response were prepared for the different demographic groups (e.g., female students, rural students, etc.) and for the sample as a whole. Percentages were also used to summarize and compare responses of the different groups.

Data were compiled using a Clipper program developed for this project by Steve Saroff of CK Computer Consultants. The source code for the program is available from the author upon request.

Arcsin stretch transformations were performed on the data discussed in Chapter 4 in order to equalize the percentage differences near the upper and lower limits of the percentage range with differences in the middle of the range. Stretching the numbers near zero and 100 is necessary because a small change is of more consequence when a percentage is near zero or 100. For example, reducing the percentage of students who expressed utilitarian attitudes from 4% to 2% would have reduced the number of such attitudes by one-half, whereas reducing the percentage from 50% to 48% would make little real difference (Kenny, 1987).

The stretch transformations were performed in order to check the relative importance of the percentage differences cited in the discussion (the stretch transformation data are listed in the appendix).

Tests of statistical significance were not considered appropriate or useful in this study, due to the qualitative nature of the subject and the limited sample size. Instead, the analysis focused on the practical significance of the responses and their implications.

This study is intended to be an initial survey of attitudes which may shed light on possible differences based on demographic factors, and provide direction for future research in environmental attitudes, and not a definitive statistical representation of the population's attitudes.

Example of Analysis

In order to illustrate the process used to analyze the surveys, a sample analysis follows, based on record number one. In story one, question a. ("Do you think Mr. Z should trap and kill the bear? Why or why not?") this student expressed a concern that the cubs would be left alone to die if the mother bear were killed. This fit most appropriately into the category of an ethical attitude which includes concerns about cruelty. The concern about the cubs was also noted as a "main concern" (the key word "cubs" was used).

In question b., "Do you like having grizzly bears living in Montana? Why or why not?", She answered, "no because the bears will kill people and they can really hurt a person" (spelling corrected).

This is a negative attitude response based on fear of the animal. Also, because she answered the question in a way that was unfavorable toward having the animals around, this was compiled as an unfavorable response in tables 11 and 12.

In response to the question a., after story two, this student said that the woman should use the spray "because I would [not] like to get bit from the spider" (spelling corrected). This is a negative attitude response based on fear of being bitten by the spiders. It is also an "unfavorable" response to the question. Question b. asked "Would it matter if all the spiders in the area were killed? Why or why not?." To this she responded, "No, because there are spiders everywhere else too so they can still bite you" (spelling corrected). She has assigned a different significance to this question than the author intended, but she still responded with a negative attitude. This attitude has already been counted in question a., and each type of attitude was counted only once in each story, so it was not counted again. The unfavorable response for question b. was counted, however.

Story three, question a. asked "Do you think they should drain the pond? Why or why not?" The student responded, "No because there are living animals in that pond they can't just kill the fish and the other animals" (spelling corrected). This was not as clear an expression of an attitude as many responses, but it implied an ethical concern about taking lives. As such, it was counted as an ethical attitude response.

Question b. asked "Do you feel the lives of the fish and other animals in the pond are important? Why or why not?" She responded,

"Yes because they are animals they make other animals that way we have a lot of fish." This response was also a difficult one to categorize, however, having a lot of fish probably means having a lot of fish to consume (she says "that way we have a lot of fish," emphasis added), so it was counted as a utilitarian response. It could also have been categorized as a naturalistic response if it was taken to mean that having a lot of fish was nice just for the sake of having them around, or as an ecological response if it was taken to show a concern for the fish becoming extinct. Categorizing the more vague responses required a judgment from the researcher based on the context and the perspective gained from reading all the responses on that individual's survey paper. Making an educated guess with respect to these answers was determined to be more useful than discarding them.

This student did not make any comments which were considered to be "connected", in the sense described in the following chapter, in the course of answering the survey questions. An example of a "connected" response is "...they are living like us..." (record #81, question 3. b.) or "...they have heart and brains just like ours and how would you like it if someone drained the oxygen out of the earth?" (record #92, question 3. b.). These responses express a feeling of connectedness with other living things by relating the animals' lives and experiences to their own.

CHAPTER 4
RESULTS OF INVESTIGATION

The results of this study indicate that there were differences in attitudes between the demographic groups. Overall, however, attitudes expressed were quite similar from one group to another. Differences were noted based on distribution of attitude types, main concerns, "connected" responses ("connectedness" will be discussed in a later section), and unfavorable responses (those that suggested killing the bear, using the spray on the spiders, draining the pond, or indicated in the second question of each story that they did not like having the animals around, did not believe that their existence mattered or did not believe that the animals' lives were important).

Description of Subgroups

Each subgroup and the number of students in each are listed in Table 1. The subgroups are based on gender (boy or girl), the school they attend (Superior, Alberton, Rattlesnake, or Porter) and whether they identified themselves as living in town or in the country (town or rural). The subgroups composed of the students from Superior and Alberton combined (S + A) and Missoula's Rattlesnake and Porter schools combined (R + P) provided another way in which to look for differences based on residency in more rural or more metropolitan areas. The rural and town subgroups are based on the students' own perception of where their homes are, and the S + A and R + P subgroups are based solely on the school districts in which they reside.

TABLE 1. Number of Students in Each Subgroup

Girls	45
Boys	58
Superior (Sup)	26
Alberton (Alb)	16
Rattlesnake (Rat)	23
Porter (Por)	38
Rural	23
Town	80
S + A	42
R + P	61
Total Sample	103

TABLE 2. Total number of sixth-grade students in each district

Missoula	577
Superior	28
Alberton	17

Attitudes

Tables of the frequency distributions and percentage summaries of attitudes resulting from this investigation follow. Letters in the tables represent attitude types. The attitude types are:

L=legalistic
N=naturalistic
E=ecological
H=humanistic
B=ethical
S=scientific
A=aesthetic
U=utilitarian
D=dominionistic
C=negative

*Legalistic = concern for staying within the bounds of the law.

*Naturalistic = appreciation of, or affection for nature (natural processes, wildlife and the outdoors).

*Ecological = concern for the well-being of the ecosystem and an awareness of the importance of parts of the system to the whole.

*Humanistic = concern for preferences and desires of human beings.

*Ethical = concern for ethics in human-wild animal interactions; includes concern about cruelty, injustice and recognizing rights.

*Scientific = interest in the physical characteristics and behavior of animals.

*Aesthetic = appreciation of animals for their beauty or for animals as symbols (for example, as symbols of Montana's unique wild character).

*Utilitarian = valuing wildlife or wilderness for its practical uses to humankind, i.e. for food, clothing or potential for development.

*Dominionistic = interest in mastery of and dominion over nature; the belief that human beings should subdue wildlife and take over wilderness.

*Negative = concern for avoiding animals due to dislike, fear, or prudence.

TABLE 3. Frequency Distribution and Percentages[1] (in parentheses) of Attitude Types for Stories 1 + 2 + 3

Group	Girls	Boys	Sup	Alb	Rat	Por	Rural	Town	S+A	R+P	Whole Group
Attit.											
L	21 (9)	26 (9)	14 (10)	4 (5)	13 (11)	16 (9)	8 (6)	39 (10)	18 (8)	29 (10)	47 (9)
N	36 (16)	46 (16)	22 (1)	15 (18)	16 (14)	29 (17)	21 (16)	61 (16)	37 (16)	45 (16)	82 (16)
E	46 (20)	62 (21)	30 (20)	18 (21)	24 (21)	36 (19)	25 (19)	83 (21)	48 (21)	60 (21)	10 (1)
H	2 (1)	1 (0)	0 (0)	2 (2)	1 (1)	0 (0)	1 (1)	2 (1)	2 (1)	1 (0)	3 (1)
B	59 (26)	59 (20)	31 (21)	18 (21)	29 (25)	40 (23)	26 (20)	92 (24)	49 (21)	69 (24)	11 (3)
S	2 (1)	4 (1)	1 (1)	2 (2)	0 (0)	3 (2)	2 (2)	4 (1)	3 (1)	3 (1)	6 (1)
A	12 (5)	16 (6)	15 (10)	1 (1)	5 (4)	7 (4)	9 (7)	19 (5)	16 (7)	12 (4)	28 (5)
U	28 (12)	61 (21)	26 (18)	18 (21)	16 (14)	29 (17)	27 (21)	62 (16)	44 (19)	45 (16)	89 (17)
D	0 (0)	1 (0)	1 (1)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	1 (0)	0 (0)	1 (0)
C	20 (9)	17 (6)	8 (5)	7 (8)	11 (10)	11 (6)	10 (8)	27 (7)	15 (6)	22 (8)	37 (7)
Total	226	293	148	85	115	171	130	338	233	286	519

TABLE 4. Frequency Distribution and Percentages[2] (in parentheses) of Attitude Types for Story 1

Group	Girls	Boys	Sup	Alb	Rat	Por	Rural	Town	S+A	R+P	Whole Group
Attit.											
L	20 (44)	26 (45)	13 (50)	4 (25)	13 (57)	16 (42)	8 (35)	38 (48)	17 (41)	29 (48)	46 (45)
N	24 (53)	38 (66)	16 (62)	9 (56)	13 (57)	24 (63)	14 (61)	48 (60)	25 (60)	37 (61)	62 (60)
E	10 (22)	12 (21)	8 (31)	3 (19)	2 (9)	9 (24)	5 (22)	17 (21)	11 (26)	11 (18)	22 (21)
H	0 (0)	1 (2)	0 (0)	1 (6)	0 (0)	0 (0)	0 (0)	1 (1)	1 (2)	0 (0)	1 (1)
B	24 (53)	25 (43)	14 (54)	7 (44)	13 (57)	15 (40)	11 (48)	38 (48)	21 (50)	28 (46)	49 (48)
S	2 (4)	2 (3)	1 (4)	1 (6)	0 (0)	2 (5)	1 (4)	3 (4)	2 (5)	2 (3)	4 (4)
A	7 (16)	13 (22)	12 (46)	1 (6)	2 (9)	5 (13)	5 (22)	15 (19)	13 (31)	7 (12)	20 (19)
U	0 (0)	6 (10)	1 (4)	3 (19)	0 (0)	2 (5)	4 (17)	2 (3)	4 (10)	2 (4)	6 (6)
D	0 (0)	1 (2)	1 (4)	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	1 (2)	0 (0)	1 (1)
C	9 (20)	7 (1)	3 (12)	4 (25)	6 (26)	3 (8)	5 (22)	11 (14)	7 (17)	9 (15)	16 (16)

[1]Frequency of particular attitude expressed by subgroup, divided by total number of attitude responses expressed by that subgroup (multiplied by one hundred).

[2]Frequency of particular attitude expressed by subgroup for story one, divided by the total number of attitude responses expressed by that subgroup for story one (multiplied by one hundred).

TABLE 5. Frequency Distribution and Percentages[3] (in parentheses) of Attitude Types for Story 2

Group	Girls	Boys	Sup	Alb	Rat	Por	Rural	Town	S+A	R+P	Whole Group
Attit.											
L	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
N	3 (7)	3 (5)	2 (8)	1 (6)	1 (4)	2 (5)	2 (9)	4 (5)	3 (7)	3 (5)	6 (6)
E	14 (31)	19 (33)	7 (27)	6 (38)	10 (44)	10 (26)	8 (35)	25 (31)	13 (31)	20 (33)	33 (32)
H	2 (4)	0 (0)	0 (0)	1 (6)	1 (4)	0 (0)	1 (4)	1 (1)	1 (2)	1 (2)	2 (2)
B	2 (4)	3 (5)	1 (4)	2 (13)	1 (4)	1 (3)	2 (9)	3 (4)	3 (7)	2 (3)	5 (5)
S	0 (0)	1 (2)	0 (0)	0 (0)	0 (0)	1 (3)	0 (0)	1 (1)	0 (0)	1 (2)	1 (1)
A	1 (2)	0 (0)	1 (4)	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	1 (2)	0 (0)	1 (1)
U	24 (53)	44 (76)	18 (69)	11 (69)	15 (65)	24 (63)	17 (74)	51 (64)	29 (69)	39 (64)	68 (66)
D	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
C	10 (22)	10 (17)	5 (19)	3 (19)	5 (22)	7 (18)	5 (22)	15 (19)	8 (19)	12 (20)	20 (19)

TABLE 6. Frequency Distribution and Percentages[4] (in parentheses) of Attitude Types for Story 3

Group	Girls	Boys	Sup	Alb	Rat	Por	Rural	Town	S+A	R+P	Whole Group
Attit.											
L	1 (2)	0 (0)	1 (4)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	1 (2)	0 (0)	1 (1)
N	9 (9)	5 (5)	4 (4)	5 (5)	2 (2)	3 (3)	5 (5)	9 (9)	9 (9)	5 (5)	14 (14)
E	22 (49)	31 (53)	15 (58)	9 (56)	12 (52)	17 (45)	12 (52)	41 (51)	24 (57)	29 (48)	53 (51)
H	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
B	33 (73)	31 (53)	16 (62)	9 (56)	15 (65)	24 (63)	13 (57)	51 (64)	25 (60)	39 (64)	64 (62)
S	0 (0)	1 (2)	0 (0)	1 (6)	0 (0)	0 (0)	1 (4)	0 (0)	1 (2)	0 (0)	1 (1)
A	4 (9)	3 (5)	2 (8)	0 (0)	3 (13)	2 (5)	3 (13)	4 (5)	2 (5)	5 (8)	7 (7)
U	4 (9)	11 (19)	7 (27)	4 (25)	1 (4)	3 (8)	6 (26)	9 (11)	11 (26)	4 (7)	15 (15)
D	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
C	1 (2)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3)	0 (0)	1 (1)	0 (0)	1 (2)	1 (1)

[3]Frequency of particular attitude expressed by subgroup for story two, divided by the total number of attitude responses expressed by that subgroup for story two (multiplied by one hundred).

[4]Frequency of particular attitude expressed by subgroup for story three, divided by the total number of attitude responses expressed by that subgroup for story three (multiplied by one hundred).

The analysis of the combined responses of the study group based on modification of Kellert's (1985) typology indicated that the female students expressed a higher percentage of ethically-based attitudes than did their male counterparts (26% vs. 20%). Interestingly, girls also expressed more negative attitudes (attitudes based on fear, dislike, or prudence with respect to the animals) than did boys (9% vs. 6%). This difference was small, but may indicate that although girls tend to be more afraid of the animals they do not consider taking actions against the animals appropriate. Perhaps their moral concerns over-ride their fear or dislike of the animals. Boys expressed a higher percentage of utilitarian attitudes than did girls (21% vs. 12%). The relative absence of utilitarian attitudes in the sample of girls may correspond with their higher percentage of ethical attitudes; they may have been less inclined to consider animals' material value if they were concerned with the moral implications of the animals' treatment.

Students identified as rural tended to be less legalistic in expressed attitudes than those identified as living in town (6% vs. 10%). Likewise, students from Superior and Alberton schools expressed a lower percentage of legalistic attitudes than did students from Missoula's Rattlesnake and Porter schools. This seems reasonable based on the fact that the rural students live more independently in an isolated setting. They may be less exposed to societal norms and pressures than the other students and so may be less concerned with the legal implications of the hypothetical actions outlined in the stories. The rural subgroup along with the Superior/Alberton subgroup also expressed a slightly higher per-

centage of aesthetic attitudes than did the students living in town or the Missoula students (7% vs. 5% and 7% vs. 4%, respectively). This was an unexpected outcome, but reasonable in light of the fact that a desire for beautiful surroundings may have prompted their families to choose to live in a rural setting. Rural students expressed a higher percentage of utilitarian attitudes than did town students (21% vs. 16%). This seems contradictory to the aesthetic nature of their expressed attitudes. However, the percentage of aesthetic attitudes, while higher than that of the town students, was still small overall at 7%. A factor in the perceived contradiction may be that the rural children expressing aesthetic attitudes were not the same ones that expressed the utilitarian attitudes. Certainly, different reasons exist for choosing to live in a rural setting.

Analysis of the attitudes expressed in story one revealed some of the same trends found in the combined data from all three stories. Girls were more ethical in their responses than the boys (53% vs. 43%), also more negative (20% vs. 12%), and boys were more utilitarian (10% vs. 0%). In addition, boys expressed a higher percentage of naturalistic attitudes than did girls in this story (66% vs. 53%). This difference could be explained by differences in the amount of outdoor experience between the two groups. If boys generally spend more time outdoors in the natural environment, then it would be reasonable to expect a greater affection for the natural world. Whether there is, in fact, a difference in the amount of outdoor experience between girls and boys would have to be determined in further study.

In story one, the rural students expressed a lower percentage of legalistic attitudes than the town students (35% vs. 48%) as was the case in the combined data. The greater overall frequency of legalistic attitudes in this story is explained by the fact that the illegality of killing the bear was mentioned in the story itself. Therefore, it would be expected that this concern would be adopted by a relatively larger proportion of students than if it had not been mentioned.

Attitudes expressed in response to story two showed significant overall differences from attitudes expressed in the other stories. Many of these differences may have stemmed from the fact that the story involved spiders, rather than creatures more conventionally considered to be within the realm of "animals". Students may have found greater difficulty relating to spiders on a personal level than to bears or even fish. The results indicate that utilitarian and negative attitudes were much stronger in response to story two than in response to stories one or three. There were also more ecological responses than in story one, based on students' understanding of the role that spiders play in the food chain.

Utilitarian attitudes were expressed by 53% of girls, 76% of boys, 64% of town students, 74% of rural students, 69% of Superior/Alberton students and 64% of Missoula students. The majority of these students cited the role that spiders play in controlling insect pests. These attitudes were typed as utilitarian, rather than ecological, because the responses referred to alleviating the discomfort and annoyance that human beings experience due to the

other insects, rather than to an integral role spiders play in the ecosystem.

Negative responses were given by 22% of girls and 17% of boys. Most of the negative responses were based on a fear of spiders biting or being poisonous, or both, and on annoyances or phobias with respect to spiders. Percentages of rural and town students expressing negative attitudes were similar (22% and 19% respectively) as were Superior/Alberton and Missoula percentages (19% and 20%, respectively). Fears and phobias of spiders are common, so these results were not surprising.

Responses to questions about story three were also unique in several respects. Ethical attitudes were expressed most frequently with 73% of girls, 53% of boys, 64% of students living in town, and 57% of students living in a rural setting responding in this way. Ecological attitudes were also expressed frequently: 49% of girls, 53% of boys, 52% of rural students, and 51% of town students expressed ecological attitudes.

There were some differences among subgroups with respect to the percentage of each group expressing naturalistic attitudes. Higher percentages of girls and rural students expressed naturalistic attitudes than the other subgroups (20% of girls, 9% of boys, 22% of rural students, 11% of town students, 21% of Superior/Alberton, and 8% of Missoula students). There were also differences between the subgroups based on utilitarian responses. Boys and rural students expressed utilitarian attitudes most frequently with 19% of boys, 26% of rural students, and 26% of Superior/Alberton expressing this attitude type, contrasted by 9% of girls, 11% of town students, and

7% of Missoula students. This relative distribution was also found in the data from all three stories combined.

Main Concerns

In reviewing and analyzing the responses from this instrument it became clear that certain specific concerns were being expressed repeatedly. The author believed that it would be interesting to look at the responses based not only on attitude types, each of which may include several different concerns, but also based on the specific concerns that were cited. These frequently cited concerns were compiled under the heading of "main concerns" in the tables above. Main concerns were collected by looking for certain key words or phrases cited by respondents. Only those concerns that were cited three or more times were analyzed.

Main concerns data compiled from stories one, two, and three are expressed in terms of mean number of responses per person in each subgroup (frequency of concern divided by the number of students in each subgroup), because the data could not be expressed accurately in terms of percentages. A percentage of each subgroup expressing each main concern could not be used because the data are from the three stories combined and some of the same students could have expressed those main concerns in each story. Further, the main concerns could not be expressed as a percentage of total responses for each subgroup because main concerns are only those concerns expressed repeatedly and not all concerns expressed by students.

Specific main concerns are
C=well-being of cubs
R=animals' rights to live or be left alone
S=Appreciation of animals' strength or size
H=concern that animals' homes are being disrupted or taken away
M=contribution to Montana's unique character
B=animals' beauty
N="neat" or "cool"
F=food chain
D=dangerous nature of animal
Z=recreational opportunities
A=nature
I=animals' contribution to insect control
E=extinction
P=value for food or clothing
X=fewer animals of that kind around
Y=excitement in seeing animals
W=interest in seeing animals
V=fairness
U=similarity to human beings and human pursuit of survival
L=like or like to see
Q=annoyance or phobia
G=fact that animals were there first
J=cruelty or meanness.

TABLE 7. Frequency Distribution and Average Number of Responses per Person[5] (in parentheses) of Main Concerns for Stories 1 + 2 + 3

Group	Girls	Boys	Sup	Alb	Rat	Por	Rural	Town	S+A	R+P	Whole Group
Concern											
C	11 (0.2)	15 (0.3)	8 (0.3)	4 (0.3)	7 (0.3)	7 (0.2)	7 (0.3)	19 (0.2)	12 (0.3)	14 (0.2)	26 (0.3)
R	23 (0.5)	23 (0.4)	16 (0.6)	5 (0.3)	10 (0.4)	15 (0.4)	10 (0.4)	36 (0.5)	21 (0.5)	25 (0.4)	46 (0.4)
S	2 (0.0)	2 (0.0)	2 (0.1)	0 (0.0)	0 (0.0)	2 (0.1)	2 (0.1)	2 (0.0)	2 (0.0)	2 (0.0)	4 (0.0)
H	10 (0.2)	9 (0.2)	5 (0.2)	2 (0.1)	4 (0.2)	8 (0.2)	2 (0.1)	17 (0.2)	7 (0.2)	12 (0.2)	19 (0.2)
M	9 (0.2)	14 (0.2)	10 (0.4)	3 (0.2)	6 (0.3)	4 (0.1)	6 (0.3)	17 (0.2)	13 (0.3)	10 (0.2)	23 (0.2)
B	10 (0.2)	11 (0.2)	13 (0.5)	1 (0.1)	2 (0.1)	5 (0.1)	7 (0.3)	14 (0.2)	14 (0.3)	7 (0.1)	21 (0.2)
N	9 (0.2)	16 (0.3)	7 (0.3)	5 (0.3)	3 (0.1)	10 (0.3)	9 (0.4)	16 (0.2)	12 (0.3)	13 (0.2)	25 (0.2)
F	19 (0.4)	21 (0.4)	5 (0.2)	8 (0.5)	15 (0.7)	12 (0.3)	10 (0.4)	30 (0.4)	13 (0.3)	27 (0.4)	40 (0.4)
D	16 (0.4)	13 (0.2)	7 (0.3)	5 (0.3)	7 (0.3)	10 (0.3)	6 (0.3)	23 (0.3)	12 (0.3)	17 (0.3)	29 (0.3)
Z	1 (0.0)	5 (0.1)	2 (0.1)	2 (0.1)	0 (0.0)	2 (0.1)	2 (0.1)	4 (0.1)	4 (0.1)	2 (0.0)	6 (0.1)
A	8 (0.2)	11 (0.2)	2 (0.1)	6 (0.4)	1 (0.0)	10 (0.3)	8 (0.3)	11 (0.1)	8 (0.2)	11 (0.2)	19 (0.2)
I	21 (0.5)	37 (0.7)	19 (0.7)	8 (0.5)	13 (0.6)	18 (0.5)	15 (0.7)	43 (0.5)	27 (0.6)	31 (0.5)	58 (0.6)
E	27 (0.6)	30 (0.5)	14 (0.5)	9 (0.6)	13 (0.6)	21 (0.6)	10 (0.4)	47 (0.6)	23 (0.5)	34 (0.6)	57 (0.6)
P	3 (0.1)	9 (0.2)	5 (0.2)	3 (0.2)	0 (0.0)	4 (0.1)	4 (0.2)	8 (0.1)	8 (0.2)	4 (0.1)	12 (0.1)
X	6 (0.1)	12 (0.2)	4 (0.2)	5 (0.3)	3 (0.1)	6 (0.2)	7 (0.3)	11 (0.1)	9 (0.2)	9 (0.1)	18 (0.2)
Y	1 (0.0)	2 (0.0)	1 (0.0)	0 (0.0)	2 (0.1)	0 (0.0)	0 (0.0)	3 (0.0)	1 (0.0)	2 (0.0)	3 (0.0)
W	3 (0.1)	6 (0.1)	2 (0.1)	2 (0.1)	1 (0.0)	4 (0.1)	2 (0.1)	7 (0.1)	4 (0.1)	5 (0.1)	9 (0.1)
V	11 (0.2)	3 (0.1)	3 (0.1)	0 (0.0)	3 (0.1)	8 (0.2)	3 (0.1)	11 (0.1)	3 (0.1)	11 (0.2)	14 (0.1)
U	4 (0.1)	2 (0.0)	1 (0.0)	0 (0.0)	3 (0.1)	2 (0.1)	0 (0.0)	6 (0.1)	1 (0.0)	5 (0.1)	6 (0.1)
L	10 (0.2)	10 (0.2)	3 (0.1)	2 (0.1)	7 (0.3)	8 (0.2)	0 (0.0)	20 (0.3)	5 (0.1)	15 (0.2)	20 (0.2)
Q	9 (0.2)	7 (0.1)	4 (0.2)	2 (0.1)	3 (0.1)	7 (0.2)	5 (0.2)	11 (0.1)	6 (0.1)	10 (0.2)	16 (0.2)
G	7 (0.2)	8 (0.2)	3 (0.1)	1 (0.1)	8 (0.3)	3 (0.1)	0 (0.0)	15 (0.2)	4 (0.1)	11 (0.2)	15 (0.1)
J	8 (0.2)	4 (0.1)	1 (0.0)	3 (0.2)	3 (0.1)	5 (0.1)	4 (0.2)	8 (0.1)	4 (0.1)	8 (0.1)	12 (0.0)

[5]Frequency of particular main concern expressed by subgroup, divided by the total number of individuals in that subgroup.

TABLE 8. Frequency Distribution and Percentages[6] (in parentheses) of Main Concerns for Story 1

Group	Girls	Boys	Sup	Alb	Rat	Por	Rural	Town	S+A	R+P	Whole Group
Concern											
C	11 (24)	15 (26)	8 (31)	4 (25)	7 (30)	7 (18)	7 (30)	19 (24)	12 (29)	14 (23)	26 (25)
R	5 (11)	2 (3)	2 (8)	1 (6)	3 (13)	1 (3)	2 (9)	5 (6)	3 (7)	4 (7)	7 (7)
S	2 (4)	2 (3)	2 (8)	0 (0)	0 (0)	2 (5)	2 (9)	2 (3)	2 (5)	2 (3)	4 (4)
H	2 (4)	0 (0)	0 (0)	0 (0)	1 (4)	1 (3)	0 (0)	2 (3)	0 (0)	2 (3)	2 (2)
M	8 (18)	12 (21)	8 (31)	2 (13)	6 (26)	4 (11)	4 (17)	16 (20)	10 (24)	10 (16)	20 (19)
B	8 (18)	10 (17)	12 (46)	1 (6)	2 (9)	3 (8)	4 (17)	14 (18)	13 (31)	5 (8)	18 (17)
N	7 (16)	15 (26)	6 (23)	4 (25)	2 (9)	10 (26)	8 (35)	14 (18)	10 (24)	12 (20)	22 (21)
F	2 (4)	2 (3)	1 (4)	1 (6)	1 (4)	1 (3)	1 (4)	3 (4)	2 (5)	2 (3)	4 (4)
D	9 (20)	8 (14)	3 (12)	3 (19)	6 (26)	5 (13)	4 (17)	13 (16)	6 (14)	11 (18)	17 (17)
Z	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
A	3 (7)	5 (9)	0 (0)	1 (6)	0 (0)	7 (18)	2 (9)	6 (8)	1 (2)	7 (12)	8 (8)
I	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
E	6 (13)	2 (3)	2 (8)	1 (6)	1 (4)	4 (11)	1 (4)	7 (9)	3 (7)	5 (8)	8 (8)
P	0 (0)	4 (7)	0 (0)	2 (13)	0 (0)	2 (5)	2 (9)	2 (3)	2 (5)	2 (3)	4 (4)
X	6 (13)	9 (16)	4 (15)	4 (25)	2 (9)	5 (13)	5 (22)	10 (13)	8 (19)	7 (12)	15 (15)
Y	1 (2)	2 (3)	1 (4)	0 (0)	2 (9)	0 (0)	0 (0)	3 (4)	1 (2)	2 (3)	3 (3)
W	2 (4)	6 (10)	1 (4)	2 (13)	1 (4)	4 (11)	1 (4)	7 (9)	3 (7)	5 (8)	8 (8)
V	6 (13)	2 (3)	1 (4)	0 (0)	2 (9)	5 (13)	1 (4)	7 (9)	1 (2)	7 (12)	8 (8)
U	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
L	8 (18)	9 (16)	2 (8)	2 (13)	6 (26)	7 (18)	0 (0)	17 (21)	4 (10)	13 (21)	17 (17)
Q	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
G	3 (7)	6 (10)	2 (8)	1 (6)	5 (22)	1 (3)	0 (0)	9 (11)	3 (7)	6 (10)	9 (9)
J	2 (4)	2 (3)	0 (0)	0 (0)	0 (0)	4 (11)	0 (0)	4 (5)	0 (0)	4 (7)	4 (4)

[6]Percentage of subgroup expressing particular main concern for story one (frequency of particular concern expressed by subgroup for story one, divided by the number of individuals in that subgroup, multiplied by one hundred).

TABLE 9. Frequency Distribution and Percentages[7] (in parentheses) of Main Concerns for Story 2

Group	Girls	Boys	Sup	Alb	Rat	Por	Rural	Town	S+A	R+P	Whole Group
Concern											
C	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
R	1 (2)	3 (5)	1 (4)	2 (13)	0 (0)	1 (3)	1 (4)	3 (4)	3 (7)	1 (2)	4 (4)
S	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
H	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
M	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
B	1 (2)	0 (0)	1 (4)	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	1 (2)	0 (0)	1 (1)
N	2 (4)	1 (2)	1 (4)	1 (6)	1 (4)	0 (0)	1 (4)	2 (3)	2 (5)	1 (2)	3 (3)
F	11 (24)	14 (24)	3 (12)	4 (25)	10 (44)	8 (21)	6 (26)	19 (24)	7 (17)	18 (30)	25 (24)
D	7 (16)	5 (9)	4 (15)	2 (13)	1 (4)	5 (13)	2 (9)	10 (13)	6 (14)	6 (10)	12 (12)
Z	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
A	1 (2)	4 (7)	2 (8)	2 (13)	0 (0)	1 (3)	3 (13)	2 (3)	4 (10)	1 (2)	5 (5)
I	21 (47)	36 (62)	18 (69)	8 (50)	13 (57)	18 (47)	15 (65)	42 (53)	26 (62)	31 (51)	57 (55)
E	2 (4)	1 (2)	0 (0)	0 (0)	1 (4)	2 (5)	0 (0)	3 (4)	0 (0)	3 (5)	3 (3)
P	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
X	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Y	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
W	1 (1)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)	1 (1)	0 (0)	1 (1)
V	0 (0)	1 (2)	0 (0)	0 (0)	1 (4)	0 (0)	0 (0)	1 (1)	0 (0)	1 (2)	1 (1)
U	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
L	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Q	8 (18)	7 (12)	4 (15)	2 (13)	3 (13)	6 (16)	5 (22)	10 (13)	6 (14)	9 (15)	15 (15)
G	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
J	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

[7]Percentage of subgroup expressing a particular main concern for story two (frequency of particular concern expressed by that subgroup for story two, divided by the number of individuals in that subgroup, multiplied by one hundred).

TABLE 10. Frequency Distribution and Percentages[8] (in parentheses) of Main Concerns for Story 3

Group	Girls	Boys	Sup	Alb	Rat	Por	Rural	Town	S+A	R+P	Whole Group
Concern											
C	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
R	17 (38)	18 (31)	13 (50)	2 (13)	7 (30)	13 (34)	7 (30)	28 (35)	15 (36)	20 (33)	35 (34)
S	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
H	8 (18)	9 (16)	5 (19)	2 (13)	3 (13)	7 (18)	2 (9)	15 (19)	7 (17)	10 (16)	17 (17)
M	1 (2)	2 (3)	2 (8)	1 (6)	0 (0)	0 (0)	2 (9)	1 (1)	3 (7)	0 (0)	3 (3)
B	1 (2)	1 (2)	0 (0)	0 (0)	0 (0)	2 (5)	2 (9)	0 (0)	0 (0)	2 (3)	2 (2)
N	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
F	6 (13)	5 (9)	1 (4)	3 (19)	4 (17)	3 (8)	3 (13)	8 (10)	4 (10)	7 (12)	11 (11)
D	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Z	1 (2)	5 (9)	2 (8)	2 (13)	0 (0)	2 (5)	2 (9)	4 (5)	4 (10)	2 (3)	6 (6)
A	4 (9)	2 (3)	0 (0)	3 (19)	1 (4)	2 (5)	3 (13)	3 (4)	3 (7)	3 (5)	6 (6)
I	0 (0)	1 (2)	1 (4)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	1 (2)	0 (0)	1 (1)
E	19 (42)	27 (47)	12 (46)	8 (50)	11 (48)	15 (40)	9 (39)	37 (46)	20 (48)	26 (43)	46 (45)
P	3 (7)	5 (9)	5 (19)	1 (6)	0 (0)	2 (5)	2 (9)	6 (8)	6 (14)	2 (3)	8 (8)
X	0 (0)	3 (5)	0 (0)	1 (6)	1 (4)	1 (3)	2 (9)	1 (1)	1 (2)	2 (3)	3 (3)
Y	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
W	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
V	5 (11)	0 (0)	2 (8)	0 (0)	0 (0)	3 (8)	2 (9)	3 (4)	2 (5)	3 (5)	5 (5)
U	4 (9)	2 (3)	1 (4)	0 (0)	3 (13)	2 (5)	0 (0)	6 (8)	1 (2)	5 (8)	6 (6)
L	2 (4)	1 (2)	1 (4)	0 (0)	1 (4)	1 (3)	0 (0)	3 (4)	1 (2)	2 (3)	3 (3)
Q	1 (2)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3)	0 (0)	1 (1)	0 (0)	1 (2)	1 (1)
G	4 (9)	2 (3)	1 (4)	0 (0)	3 (13)	2 (5)	0 (0)	6 (8)	1 (2)	5 (8)	6 (6)
J	6 (13)	2 (3)	1 (4)	3 (19)	3 (13)	1 (3)	4 (17)	4 (5)	4 (10)	4 (7)	8 (8)

[8]Percentage of subgroup expressing particular main concern for story three (frequency of particular concern expressed by that subgroup for story three, divided by the number of individuals in that subgroup, multiplied by one hundred).

The most frequently expressed concerns for the three stories combined were related to increases in numbers of insects and extinction. Concern about increasing numbers of insects refers to the concern that killing the spiders, in story two, would aggravate the overall problem of having too many annoying insects around since spiders control the insect population. Extinction concerns were expressed most frequently in story three with respect to the rare fish. This concern was probably so frequently cited because the story mentioned that some of the fish were close to extinction. This certainly would have reinforced any concerns the students might have had about the issue.

Concerns about the food chain and the animals' rights to live were the second most frequently cited main concerns. Food chain concerns arose most often in story two responses, based on the students' recognition that spiders exist toward the beginning of the food chain and so are important to the survival of many other creatures.

There were some differences in main concerns expressed based on gender and rural or town residency. For example, the concern that the animals were "here first" was mentioned 15 times overall, but not once by the students identified as living out of town. The average number of responses per person regarding this issue was also much lower for the Superior/Alberton group than for the Missoula group (.1 : .2). Girls were concerned about the issue of cruelty to the animals 2 : 1 over boys (.2 : .1). Other differences between subgroups with respect to main concerns were that boys expressed concerns about the value of animals for food or clothing propor-

tionately three times more often than girls, and Superior/Alberton students two times more than Missoula students. Also, girls expressed proportionately more concern about the issue of fairness to animals, than did boys (.4 : .1). Girls also expressed more fear and annoyance of animals than did boys (.4 : .2). This suggests that girls were generally able to separate their fear of or annoyance with animals from their decisions about how the animals in question should be treated. Another possibility is that girls in the sample were more able to express their fears of the animals than were the boys. This would be a reasonable outcome if there were greater societal expectations of bravery in boys and greater societal acceptance of fear and timidity in girls. If this were the case, then the boys may have repressed their more direct feelings of fear and instead expressed them by rationalizing killing the animals.

There were many differences between subgroups with respect to the main concerns data compiled for each story individually. However, the issue of main concerns was not central to the thesis of this study, so comparisons of the responses from each subgroup for each of the three stories, based on the tables above, will be left to the reader.

Unfavorable Responses to Questions

The study sample's responses were also analyzed with respect to whether the students responded to the questions after each story in a way that was favorable or unfavorable toward the existence of the animals.

TABLE 11. Frequency Distribution of Unfavorable Responses

Group	Girls	Boys	Sup	Alb	Rat	Por	Rural	City	S+A	R+P	Whole Group
Story #											
1 a)	1	8	2	3	2	2	5	4	4	5	9
b)	3	2	2	0	0	3	2	3	1	4	5
2 a)	14	14	9	2	4	13	11	17	6	22	28
b)	10	9	6	2	3	8	8	11	4	15	19
3 a)	3	6	3	1	2	3	4	5	3	6	9
b)	1	1	1	0	0	1	1	1	1	1	2
1+2+3	32	40	23	8	11	30	31	41	19	53	72

TABLE 12. Percentage of Each Subgroup Making Unfavorable Responses

Group	Girls	Boys	Sup	Alb	Rat	Por	Rural	City	S+A	R+P	Whole Group
Story #											
1	9	17	15	19	9	13	17	12	22	11	14
2	53	40	58	25	30	55	45	46	44	46	46
3	9	12	15	6	9	11	12	10	17	9	11
1+2+3	12	12	15	8	8	13	12	11	14	11	12
(% of Total Responses)											

With respect to the three stories combined, Superior students responded unfavorably 15% of the time, followed by rural students at 14%, Porter school students at 13%, girls and boys both at 12%, in-town students at 11%, and Alberton and Rattlesnake students at 8%. The average for the sample as a whole was 12%.

The girls responded with a lower percentage of unfavorable answers than boys in stories one and three, but a higher percentage in story two. Rural students and Superior/Alberton students responded with a higher percentage of unfavorable answers than the in-town and Missoula students in stories one and three, but lower in story two.

Connected Responses

Carol Gilligan put forth new ideas regarding gender differences in psychological development in her book In a Different Voice (1982). Gilligan's main assertion was that girls' psychological development historically has been investigated from a male perspective and based on a male, not a female intellectual style. This has resulted in the misconception that girls are generally inferior in intellectual prowess. Based on her assertion, Gilligan reassessed the interpretations from Kohlberg's famous study of levels of moral development and found that the girls in the study were not responding in a way that was in some way inferior to the boys' responses, rather that they were responding differently, based on a much different concept of human relationships. The girls tended to see the relationships in Kohlberg's hypothetical moral dilemma as points of strength, relating to each character with empathy. The boys, on the other hand, tended to see the relationships depicted in the story as confrontational and threatening. Thus, the girls responses did not fit neatly into Kohlberg's levels of moral development. In the girls' efforts to make sense out of a set of circumstances that seemed completely unacceptable, they seemed to be confused and weak-minded to interviewers who were trying to fit the responses into the prescribed developmental levels.

In reality, according to Gilligan, the female conception of human relationships finds strength in connectedness, whereas the male conception finds strength in separateness.

An attempt was made in the course of analyzing the responses obtained in this study to determine if boys and girls perceived

human-animal relationships differently, in light of Gilligan's revelations regarding the different ways in which females and males perceive human relationships. The concept of connectedness is less concrete with respect to human-animal relationships than with respect to human relationships, largely because of the absence of clear lines of human-animal communication. Therefore, broader criteria were used in defining "connected" responses in this study. Any response which related the animals' experience to human experience, or expressed a feeling of empathy for the animals and their situation was regarded as being "connected".

TABLE 13. Frequency of "Connected" Responses

Group	Girls	Boys	Sup	Alb	Rat	Por	Rural	City	S+A	R+P	Whole Group
Story #											
1	5	2	5	0	1	1	5	2	2	5	7
2	1	1	1	1	0	0	2	0	1	1	2
3	16	11	6	5	8	8	11	16	2	25	27
1+2+3	22	14	12	6	9	9	18	18	5	31	36

TABLE 14. Percentage of Each Subgroup Making a "Connected" Response

Group	Girls	Boys	Sup	Alb	Rat	Por	Rural	City	S+A	R+P	Whole Group
Story #											
1	11	3	19	0	4	3	12	3	9	6	7
2	2	2	4	6	0	0	5	0	4	1	2
3	36	19	23	31	35	21	26	26	9	31	26

TABLE 15. Average Number of "Connected" Responses per Person[9]

Group	Girls	Boys	Sup	Alb	Rat	Por	Rural	Town	S+A	R+P	Whole Group
Story #											
1+2+3	.49	.24	.46	.38	.39	.24	.43	.30	.22	.39	.35

Based on this definition of connectedness, girls more frequently expressed a feeling of connectedness with the other animals than did boys, as summarized in tables 13, 14, and 15. This was true with respect to responses for all three stories combined and

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[9]Total number of "connected" responses expressed by subgroup, for all three stories combined, divided by the total number of individuals in that subgroup.

for stories one and three separately. Girls expressed a feeling of connectedness with the spiders in story two with the same frequency as boys, but the percentage of girls responding this way was still higher because there were fewer girls in the study group.

Interestingly, the rural students expressed proportionately more connected responses than did the in-town students. Students from the Superior and Alberton districts, however, expressed a lower percentage of connected responses than did students from Missoula. Perhaps students living in closer proximity to other animals have developed a keener sense of connection to other creatures than have those living in towns.

Student Comments

The sixth-grade students expressed many thoughts and ideas in the course of writing their responses to the study questions. Many of their responses demonstrated amazing insight and eloquence.

The bear dilemma in story one inspired numerous comments. A girl from Superior said, "This bear is really special to me." Another explained, "Montana is mostly forest and if you get rid of a forest animal it would be like killing part of a forest". A boy from Superior said, "...it would be an honor to know that these bears that are so close to being extinct are living in Montana..." A girl in Alberton described bears as "...wonderful creatures" and an Alberton boy wrote, "...[bears are] an animal of beauty and grace." Another explained, "Montana is a wilderness state...it gives Montana a special quality to have a grizzly bear in Montana knowing that a lot of places don't even have mountains and forests."

A boy from Missoula's Rattlesnake school said, "They are a magnificent animal and we have to learn to live with them." At Porter school in Missoula a girl said, "They are part of the wilderness and they make up our culture," and a boy, "Bears belong to the wilderness."

The spiders' plight in story two did not inspire as much comment as did the bears'. Students did express some insightful ideas but they tended to speak more generically about the spiders. For example, some boys explained, "Everything has a purpose," and "I believe in live and let live."

Story three provoked some interesting comments regarding the water creatures in the pond. One girl in Superior said, "Move the people not the fish." A boy in Superior reasoned, "The resort would bring money." In Alberton a girl declared, "Animals shouldn't die just because of humans..." and "...buildings trash the earth..." Another said, "If our lives are important theirs are too. "An Alberton boy stated, "The wildlife comes first in my book...soon after wildlife is gone everything is gone." Finally, a boy from Rattlesnake school in Missoula pointed out, "There are lives involved. They don't get to argue about it. They're making decisions for the fish and pond life."

These samples of students' comments indicate the level of sophistication many of them used in considering the problems outlined in the three stories.

Practical Implications

The information gathered in this study is interesting from an empirical standpoint. However, the information will also have some practical significance with respect to helping teachers help students think about environmental problems and possible solutions.

The most striking revelation for the author was the overall level at which sixth-grade students were able to consider the wildlife issues portrayed in the stories. Most students saw clearly the moral and ecological implications of the problems and the possible courses of action. Generally, the students were very sympathetic and empathetic in their responses to the animals' situations. There was a striking paucity of dominionistic and humanistic attitudes expressed in the survey, and relatively few negative attitudes were expressed. This outcome would lead one to believe that educators should not be afraid to tackle difficult wildlife and other environmental issues in their classes at this age level. The results also suggest that most students at this grade level do not need a massive sensitization to the problems that can be created for wild animals by human beings. Instead, educators could be more effective by helping students to clarify their concerns, and come to a deeper understanding of their attitudes and values with respect to wild animals. For those who have not developed a personal concern for wildlife and other environmental issues, this process would help to make them more aware of the issues and how other kids their age perceive the issues. Regardless of one's mindset about a given controversy, awareness helps people to develop informed and well-reasoned attitudes about any issue.

Each person has a right to form his or her own opinions and attitudes, but those attitudes should not be born of ignorance.

Utilitarian attitudes, expressed more frequently by boys and rural students, are not necessarily problematic. However, educators who strive to encourage a sense of appreciation for wildlife that goes beyond utility may want to incorporate activities into their lessons which bring to light other aspects of animals' existence and value. For example, exploring the importance that each animal has in the ecosystem may foster ecological attitudes, studying the interesting facets of different animals' day-to-day existence may foster naturalistic attitudes, and discussing the ethical implications of animals' treatment may foster ethical concerns. Because certain groups seem to exhibit utilitarian attitudes more than others, teachers should choose activities which relate these issues to these groups' experiences.

The greater percentage of negative responses from girls could be explained by lower levels of outdoor experience or by a greater freedom in expressing fears by girls, as discussed earlier. If the fears are in fact due to having less outdoor experience, educators could make an effort to provide quality outdoor time with their classes. This could help to make the outdoors and its wildlife less threatening. On the other hand, if girls' higher relative frequency of negative responses stems from a feeling of greater freedom in expressing their fears, then this could be an entirely healthy and justified phenomenon. Those of us living in Montana understand that some fear of wild creatures is well justified. Fears of wild animals should not be exaggerated, however, and positive outdoor

education should help to make wildlife less foreign and less frightening.

The fact that boys responded negatively to the questions more often than girls, but expressed fewer fears about animals could lead to different conclusions. To the author, it suggests that boys should be encouraged to express freely any fears they may have with respect to wildlife so that these fears are less likely to be played out by rationalizing negative actions toward animals.

CHAPTER 5
SUGGESTED IMPROVEMENTS FOR THE INSTRUMENT AND ANALYSIS

In the course of administering and analyzing the results of this survey, several possible improvements have come to mind. First, the issue of legality with respect to killing the bear could have been implied in a less influential manner within the story. It was intended to bring out attitudes that may have existed but not otherwise been expressed in the respondents' answers. However, it may well have skewed the data to show a higher relative proportion of legalistic attitudes. The same could be true of the mention of extinction in story three. Again, it was intended to provide a way to bring out existing concerns about extinction and endangered species, but it probably should have been done in a more controlled manner. If one or two attitudes were prompted, the other possible attitudes could have been referred to in a comparable way. However, this possible skewing of the data should not have changed the relative frequencies of attitudes between subgroups and so should not have affected the comparisons made in this analysis.

Improvement could also be made in the effectiveness of question c. in each section. This question was intended to provide a means of expressing attitudes for those respondents who could not accept the two basic alternatives suggested in each story. Although many students provided alternative courses of action in this question, virtually no attitudes were expressed that could be coded based on the typology used in the study. Generally, respondents explained <u>what</u> alternative action they would take but not <u>why</u>. Question c. could have been made more effective by explaining more clearly in the instructions, how to approach that question. If that question

cannot be made more effective it could be deleted from the instrument. It did provide a way for students to express other ideas, however, and may have prevented some degree of frustration on the part of respondents who could not accept the other alternatives.

An exit interview with the teachers in each class regarding any related topics that the class may have recently studied may have clarified some of the differences found between classes. For example, students in Superior expressed a much higher percentage of aesthetically-based attitudes than did students in the other schools. This might well have been prompted by a recent class discussion regarding the beauty of grizzly bears and their role as a symbol of Montana's unique character. Without information from the teachers, however, no such assumptions can be made.

The analysis could have been improved by considering more fully the responses which did not fit a prescribed attitude or main concern category. The analysis focused on a few key concepts, and in so doing may have missed some interesting information. For example a comparison could have been made of the frequency of expressed passivity in avoiding potential conflicts with the animals. Several respondents suggested that the best way to solve the problem was to move away and leave the animals alone, a response that does not fit into the attitude typology as it was defined in this study. These other comparisons might have been made by expanding the typology to include the other attitudes expressed, or by considering those issues in a separate analysis.

Overall, however, the instrument worked well and solicited clear and useful responses which helped to illuminate the attitudes held by this sample.

CHAPTER 6
TOPICS FOR FURTHER STUDY

The information gathered in this study, elucidated the need for further study on a number of questions. Some of the differences between demographic groups could be explained by a number of factors related to the groups. For example, to what extent did differences in levels of outdoor experience, if there are differences, affect the responses of boys and girls? Also, what specific characteristics shaped the differences in the responses of the rural students? A clarification of the influence that these and other cofactors have on the differences outlined in this study would be helpful in more fully understanding the implications of the results.

Future research could investigate the influence that socio-economic factors have on children's attitudes about wild animals and could explore the possibility of a correlation between parent occupations and attitudes about wildlife. For example, the responses from children whose parents work in resource extraction industries could be compared to responses from children whose parents work in service industries.

This study was intended to be a preliminary survey of sixth-graders' attitudes about wild animals. The data gathered provide useful information regarding how some students at this age-level perceive the relationship between human beings and some wild creatures. This preliminary information could be used to develop a more comprehensive instrument to gather input from a larger sample of a larger population. The data obtained in such a study could provide a statistical representation of the attitudes of a number of

different populations (e.g., Sixth graders compared to high school seniors or Montana students compared to Michigan students).

CHAPTER 7
CONCLUSION

In order to develop and implement environmental education programs in the schools effectively, educators and administrators must have an understanding of children's present way of thinking about and perceiving the environment and their relationship to it. Although there have been several different instruments developed to assess environmental attitudes of various groups, there was a need for an instrument to provide preliminary assessment of environmental attitudes of younger school children and to help target future research.

In this study, an instrument was developed to assess the attitudes that sixth graders in three western Montana school districts have about wild animals. The information gained in the study will be useful to educators and curriculum researchers in developing and implementing effective programs that take into account the general character of this age group's environmental attitudes and perceptions.

With the development of effective environmental education programs, perhaps our society can begin to tackle the problems which threaten the existence of life on our planet, and learn to live in ways that contribute to the earth's ecosystem rather than destroy it.

APPENDIX

Arcsin Two-stretch Transformations For Data Cited in Discussion of Attitude Differences (Kenny, 1987, p. 334)

p.22	26% (1.070)	20% (.927)	(difference = .143)			
	9% (.609)	6% (.495)	(difference = .114)			
p.23	21% (.952)	12% (.707)	(difference = .245)			
	6% (.495)	10% (.644)	(difference = .149)			
	7% (.536)	5% (.451)	(difference = .085)			
	7% (.536)	4% (.403)	(difference = .133)			
p.24	21% (.952)	16% (.823)	(difference = .129)			
	53% (1.631)	43% (1.430)	(difference = .201)			
	20% (.927)	12% (.707)	(difference = .220)			
	10% (.644)	0% (.000)	(difference = .644)			
	66% (1.897)	53% (1.631)	(difference = .266)			
p.24 & 25	35% (1.266)	48% (1.531)	(difference = .265)			
p.25	53% (1.631)	76% (2.118)	64% (1.855)	74% (2.071)	69% (1.961)	64% (1.855)
p.26	22% (.976)	17% (.850)	(difference = .126)			
	22% (.976)	19% (.902)	(difference = .074)			
	19% (.902)	20% (.927)	(difference = .025)			
	73% (2.049)	53% (1.631)	64% (1.855)	57% (1.711)		
	49% (1.551)	53% (1.631)	52% (1.611)	51% (1.591)		
	20% (.927)	9% (.609)	22% (.976)	11% (.676)	21% (.952)	8% (.574)
P.26 &27	19% (.902)	26% (1.070)	26% (1.070)	9% (.609)	11% (.676)	7% (.536)

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