Human dimensions of grizzly bear management in Montana

Descriptive statistics from a statewide survey of MT residents

Submitted to Montana Department of Fish, Wildlife, and Parks

March 13, 2020

Holly K. Nesbitt, Dr. Alexander L. Metcalf, and Dr. Elizabeth Covelli Metcalf

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Design and administration

We developed the questionnaire collaboratively with MT FWP.

FWP staff administered the survey according to a modified tailored design methodology, including three waves of contact. The first wave of questionnaires was delivered to the initial sample via US Postal Service in early November, 2019. A second wave of questionnaires was delivered to non-respondents in late November, 2019. The third wave of questionnaires was delivered to remaining non-respondents in early January, 2020. FWP staff entered data manually using SPSS. We conducted all analyses using RStudio.

UNIVERSITY OF MONTANA
W.A. FRANKE COLLEGE OF FORESTRY AND CONSERVATION

MONTANA FWP

«ADDRESS1»
«ADDRESS2»
«CITY», «STATE» «ZIP»-«ZIP4»

Dear Montana Household:

The University of Montana, in collaboration with Montana Fish, Wildlife & Parks (FWP), is conducting a study about grizzly bear management in Montana. You were randomly selected as a Montana resident to receive this survey – your responses are important and will help FWP to better manage grizzlies across Montana.

The questions in this survey explore your general views about grizzlies and your attitudes toward grizzly bear management actions. Your participation in this survey is completely voluntary – you may skip any question you do not wish to answer or stop the survey at any time. All your answers will be confidential – we will only report summaries of our findings. The identification number on your survey is there so we can check your name off the mailing list when you return your questionnaire, but your name will never be linked to your responses.

It should take about 15-20 minutes to complete the questionnaire. When you are done, **please use the postage-paid envelope to return the questionnaire to us**. Completing and returning the questionnaire implies your consent to participate in this study.

If you have any questions, please contact me (Alex Metcalf at the University of Montana) by phone at 406-243-4448 or by email at alex.metcalf@umontana.edu or you can contact Mike Lewis at FWP by phone at 406-444-4308 or by email at mlewis@mt.gov .

Sincerely,

Dr. Alexander L. Metcalf
W.A. Franke College of Forestry & Conservation
University of Montana

Martha Williams
Director
Montana Fish, Wildlife, & Parks

Grizzly Bear Survey

You have been randomly selected to help Montana Fish, Wildlife, & Parks (FWP) understand how Montanans like you view grizzly bear management. This survey has 8 sections with questions on your views about grizzly bears and their relationships with humans in Montana. Your responses are important – please answer questions carefully.

Are you the adult age 18 or older in your household who will have the next birthday?

- ☐ Yes → Please continue
- ☐ No → Please have the adult in your household who will have the next birthday complete the survey

Section 1 – Introduction

1. Here is a list of possible reasons why people live in Montana. Please indicate how important each item is to you as a reason for living in Montana using the 1 to 5 scale, where 1 is "Not at all Important" and 5 is "Extremely Important".
   (For each row, please circle only one number.)

	Not at all Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Family	1	2	3	4	5
Solitude	1	2	3	4	5
Recreation	1	2	3	4	5
Rural lifestyle	1	2	3	4	5
Job	1	2	3	4	5
Community	1	2	3	4	5
Hunting	1	2	3	4	5
Nature	1	2	3	4	5

Other reasons *(please specify)* _____

2. Grizzly bears… *(Please check only one box.)*
   - ☐ …live very far away from me
   - ☐ …live somewhat far away from me
   - ☐ …live in the same area as me, but I haven't seen any near my home
   - ☐ …live in the same area as me and I have seen some near my home
   - ☐ I don't know

3. In a few words, please tell us about your views on grizzly bears in Montana.
   _____
   _____

Section 2 – Your Views on Grizzly Bears

The following questions ask you about your views on the risks and benefits of grizzly bears and where you think grizzly bears belong in Montana.

4. How strongly do you agree or disagree with the following statements? Please use the 1 to 5 scale, where 1 is "Strongly Disagree" and 5 is "Strongly Agree".
   (For each row, please circle only one number.)

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
I feel threatened by grizzly bears	1	2	3	4	5
I think grizzly bears are beautiful animals	1	2	3	4	5
Grizzly bears limit my recreational opportunities	1	2	3	4	5
I travel to see grizzly bears	1	2	3	4	5
Grizzly bears are a burden I'd rather not deal with	1	2	3	4	5
I think grizzly bears are important for ecosystem health	1	2	3	4	5
I avoid recreating in areas with grizzly bears	1	2	3	4	5
I enjoy knowing that grizzly bears exist in Montana, even if I never see one	1	2	3	4	5
I am concerned about road closures to protect grizzly bear habitat	1	2	3	4	5
I think grizzly bears can positively contribute to the outdoor economy in Montana	1	2	3	4	5

5. Think about where grizzly bears currently exist in Montana. How strongly do you agree or disagree with the following statements? Please use the 1 to 5 scale, where 1 is "Strongly Disagree" and 5 is "Strongly Agree".
(For each row, please circle only one number.)

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
I think grizzly bears pose a safety risk to people I care about	1	2	3	4	5
I feel that my personal safety is threatened by grizzly bears	1	2	3	4	5
I am concerned about grizzly bears damaging things that I care about	1	2	3	4	5
Grizzly bears negatively affect my economic well-being	1	2	3	4	5

6. How strongly do you agree or disagree with the following statements? Please use the 1 to 5 scale, where 1 is "Strongly Disagree" and 5 is "Strongly Agree".
(For each row, please circle only one number.)

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
I think grizzly bears do not belong where people live	1	2	3	4	5
I think grizzly bears have a right to exist in Montana	1	2	3	4	5
I think grizzly bears do not belong in places where people recreate	1	2	3	4	5
I think grizzly bear populations are expanding naturally	1	2	3	4	5
I think grizzly bears should not be anywhere in Montana	1	2	3	4	5
I think people should learn to live with grizzly bears near their homes	1	2	3	4	5
I think grizzly bears are being imposed on me by other people	1	2	3	4	5
I think grizzly bears are part of what makes Montana special	1	2	3	4	5

7. I think grizzly bear populations in Montana are… *(Please check only one box.)*
   - ☐ …much too low
   - ☐ …too low
   - ☐ …the right size now
   - ☐ …too high
   - ☐ …much too high
   - ☐ I don't know

8. I think grizzly bear populations where I live are… *(Please check only one box.)*
   - ☐ …much too low
   - ☐ …too low
   - ☐ …the right size now
   - ☐ …too high
   - ☐ …much too high
   - ☐ I don't know

9. Ten years from now, I anticipate that grizzly bears will… *(Please check only one box.)*
   - ☐ …live very far away from me
   - ☐ …live somewhat far away from me
   - ☐ …live in the same area as me, but it is unlikely I will have seen any near my home
   - ☐ …live in the same area as me and it is likely I will have seen some near my home
   - ☐ I don't know

10. Please indicate how strongly you agree or disagree with the following statement about grizzly bears. *(Please check only one box.)*

    "It is important to maintain a self-sustaining grizzly bear population in Montana."
    - ☐ Strongly disagree
    - ☐ Disagree
    - ☐ Neither agree nor disagree
    - ☐ Agree
    - ☐ Strongly agree

11. In a few words, please describe what you believe 'successful' grizzly bear management would look like in Montana.

    _____

    _____

Section 3 – Emotional Response to Grizzly Bears

The following questions ask how you would feel in response to a scenario involving a grizzly bear. Please indicate how you would feel across three different scales of nervous to relaxed, upset to pleased, and scared to not scared using the -3 to +3 scale, where -3 is nervous and +3 is relaxed, -3 is upset and +3 is pleased, and -3 is scared and +3 is not scared.
(For each row, please circle only one number.)

12. If you were on a hike in an undeveloped area of the state and saw a grizzly bear in the distance, to what extent would you feel…

Nervous					Relaxed
-3	-2	-1	+1	+2	+3

Upset					Pleased
-3	-2	-1	+1	+2	+3

Scared					Not scared
-3	-2	-1	+1	+2	+3

13. If you were on a walk near your home and saw a grizzly bear in the distance, to what extent would you feel…

Nervous					Relaxed
-3	-2	-1	+1	+2	+3

Upset					Pleased
-3	-2	-1	+1	+2	+3

Scared					Not scared
-3	-2	-1	+1	+2	+3

Section 4 – Grizzly Bear Management

State and federal wildlife agencies can take a variety of actions to manage grizzly bears, including monitoring, research, education and outreach to the public. In some instances, grizzly bears involved in conflict might be relocated to another area, removed to a zoo, or euthanized (i.e., put to death). Currently, while under federal protection, hunting grizzly bears is illegal in the lower-48 states. If hunting became legal, state agencies could initiate regulated hunting of grizzly bears. The following questions ask about your current satisfaction or dissatisfaction with grizzly bear management and your views toward a possible grizzly bear hunting season.

14. How satisfied are you with grizzly bear management in Montana? *(Please check only one box.)*
    - ☐ Very unsatisfied
    - ☐ Unsatisfied
    - ☐ Neither unsatisfied nor satisfied
    - ☐ Satisfied
    - ☐ Very satisfied

15. Overall, how would you rate the state of grizzly bear management in Montana. *(Please check only one box.)*
    - ☐ Very unsuccessful
    - ☐ Unsuccessful
    - ☐ Neither unsuccessful nor successful
    - ☐ Successful
    - ☐ Very successful

16. Please indicate how strongly you agree or disagree with the following statement about grizzly bear management. *(Please check only one box.)*

    "Current grizzly bear management does not meet my expectations."
    - ☐ Strongly disagree
    - ☐ Disagree
    - ☐ Neither agree nor disagree
    - ☐ Agree
    - ☐ Strongly agree

17. What statement best reflects your views toward a potential grizzly bear hunting season? *(Please check only one box.)*
    - ☐ Grizzly bears should never be hunted
    - ☐ I would support a very limited grizzly bear hunting season that does not affect their population size
    - ☐ I would support enough grizzly bear hunting to manage their population size
    - ☐ I would support as much grizzly bear hunting as possible

18. Please indicate how strongly you agree or disagree with the following statement about hunting grizzly bears. *(Please check only <u>one</u> box.)*

    "Regulated hunting of grizzly bears should be used as a tool to reduce grizzly bear-human conflict."

    - ☐ Strongly disagree
    - ☐ Disagree
    - ☐ Neither agree nor disagree
    - ☐ Agree
    - ☐ Strongly agree

19. Please indicate how strongly you agree or disagree with the following statement about hunting grizzly bears. *(Please check only <u>one</u> box.)*

    "*People should have the opportunity to hunt grizzly bears as long as their population can withstand hunting pressure.*"

    - ☐ Strongly disagree
    - ☐ Disagree
    - ☐ Neither agree nor disagree
    - ☐ Agree
    - ☐ Strongly agree

Section 5 – Reducing Conflict with Grizzly Bears

Grizzly bears can be attracted to human-related food items (such as garbage, bird feeders, pet food, crops, fruit trees, livestock, farm animals, fowl, beehives, or grills/smokers) which can increase conflict with humans. The following questions ask about actions people can take to deter grizzly bear attraction to these foods and reduce the potential for grizzly bear-human conflict.

20. Please indicate whether or not you have taken the following actions to reduce the potential for grizzly bear-human conflict within the past three years, or indicate your willingness to take this action in the future.
    (For each row, please circle only one number.)

	I would not be willing to do this action	I have not done this action in the past three years, but would be willing to in the future	I have done this action in the past three years	This action is not applicable to me
Secure attractants on your property	1	2	3	☐
Follow food storage guidelines on public lands	1	2	3	☐
Carry bear spray when recreating and/or hunting	1	2	3	☐
Participate in livestock carcass removal programs	1	2	3	☐
Alter livestock practices to mitigate risk of grizzly bear predation	1	2	3	☐

21. In the past three years, have you carried a firearm to deter grizzly bears?
    - ☐ No
    - ☐ Yes

22. Do you think that a firearm or bear spray is more effective at preventing a grizzly bear attack? *(Please check only one box.)*
    - ☐ Firearm
    - ☐ Firearms and bear spray are equally effective
    - ☐ Bear spray
    - ☐ I don't know

23. Please indicate how strongly you agree or disagree with the following statement about hunting grizzly bears. *(Please check only one box.)*

"Hunting grizzly bears will make them more wary of humans."

- ☐ Strongly disagree
- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly agree

Section 6 –Wildlife Agencies & Public Input

The following questions ask about your attitudes toward the actions of wildlife management agencies and the opportunity for public input on grizzly bear management decisions.

24. How strongly do you agree or disagree with the following statements about Montana Fish, Wildlife, & Parks (FWP)? Please use the 1 to 5 scale, where 1 is "Strongly Disagree" and 5 is "Strongly Agree".
(For each row, please circle only one number.)

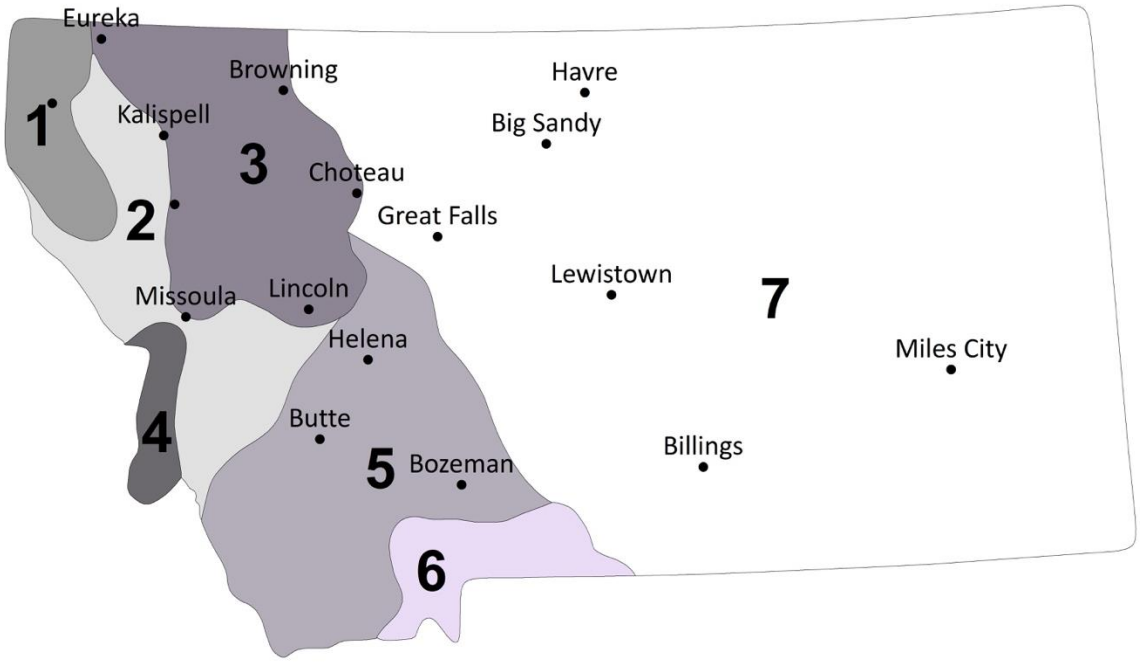
	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree	I Don't Know
I trust that FWP knows how to effectively manage grizzly bear populations	1	2	3	4	5	☐
I trust that FWP thinks in a similar way as I do about grizzly bears	1	2	3	4	5	☐
I trust that FWP knows how to respond to grizzly bear-human conflict	1	2	3	4	5	☐
I trust that FWP provides the public with the best available information on how to reduce grizzly bear-human conflict	1	2	3	4	5	☐
I trust that FWP tells the truth about grizzly bears and their population status	1	2	3	4	5	☐
I trust that FWP would take similar actions as I would to manage grizzly bears	1	2	3	4	5	☐

25. How strongly do you agree or disagree with the following statements? Please use the 1 to 5 scale, where 1 is "Strongly Disagree" and 5 is "Strongly Agree".
(For each row, please circle only one number.)

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
The average citizen can have an influence on grizzly bear management decisions	1	2	3	4	5
I have very little ability to protect my interests regarding grizzly bear management	1	2	3	4	5
I have the opportunity to provide input on grizzly bear management decisions	1	2	3	4	5
Wildlife agencies listen to my input	1	2	3	4	5
Wildlife agencies respect my way of life	1	2	3	4	5
Wildlife management is controlled by people who live outside of Montana	1	2	3	4	5

Section 7 – Grizzly Bears in Montana

This section asks you about grizzly bear populations in different areas in Montana. Below is a map of Montana with seven general areas highlighted. Each area is numbered 1 through 7.



26. Using the map of Montana above, please complete the following statements for each area using the 1 to 5 scale, where 1 is "much too low" and 5 is "much too high". *(For each row, please circle only one number.)*

	…much too low	…too low	…the right size	…too high	…much too high	I don't know
The number of grizzly bears in area 1 is…	1	2	3	4	5	☐
The number of grizzly bears in area 2 is…	1	2	3	4	5	☐
The number of grizzly bears in area 3 is…	1	2	3	4	5	☐
The number of grizzly bears in area 4 is…	1	2	3	4	5	☐
The number of grizzly bears in area 5 is…	1	2	3	4	5	☐
The number of grizzly bears in area 6 is…	1	2	3	4	5	☐
The number of grizzly bears in area 7 is…	1	2	3	4	5	☐

27. How acceptable or unacceptable is it to you to have grizzly bears living in the following areas in Montana? Please use the 1 to 5 scale, where 1 is "Very Unacceptable" and 5 is "Very Acceptable".
(For each row, please circle only one number.)

	Very Unacceptable	Unacceptable	Neither	Acceptable	Very Acceptable	I don't know
Primarily forested areas that are mostly publicly owned	1	2	3	4	5	☐
Areas with a mix of forest, open land, agricultural land, and small towns	1	2	3	4	5	☐
Areas that are mostly agricultural land with small towns	1	2	3	4	5	☐
Rural areas on the fringes of suburban development	1	2	3	4	5	☐
Suburban and urban residential areas	1	2	3	4	5	☐
Anywhere grizzly bears become established on their own	1	2	3	4	5	☐

Section 8 – About You

This last section asks a few questions about you.

28. How long have you lived at your current residence? If less than one year, please put 1.
_____ (years)

29. What type of Montana resident are you? *(Please check only one box.)*
☐ Part-time resident
☐ Full-time resident

30. About how many total acres do you own in Montana? _____ (acres)
If you don't own property, check here: ☐

31. Do you grow crops, raise livestock, or participate in any other agricultural/ranching activities in Montana? *(Please check only one box.)*
    - ☐ No
    - ☐ Yes……. If yes, please answer the following two additional questions:
        - a. What do you produce? *(Please check all that apply)*
            - ☐ Livestock
            - ☐ Fowl
            - ☐ Crops
            - ☐ Bees
            - ☐ Other *(please specify)* _____
        - b. Do you mostly do this for profit or personal consumption? *(Please check only one box)*
            - ☐ Profit
            - ☐ Personal consumption

32. Are you a part of an outdoor industry in Montana?
    - ☐ No
    - ☐ Yes……. If yes, please answer the following additional question:
        - a. Is this industry closely associated with fish and/or wildlife?
            - ☐ No
            - ☐ Yes, *(please list industry)*_____

33. Are you in another industry that may be affected by grizzly bears?
    - ☐ No
    - ☐ Yes, *(please list industry)*_____

34. Do you hunt in Montana?
    - ☐ No
    - ☐ Yes

35. Do you participate in other outdoor recreation besides hunting in Montana?
    - ☐ No
    - ☐ Yes

36. How would you describe your knowledge of grizzly bears? *(Please check only one box.)*
    - ☐ I don't know much about grizzly bears in Montana
    - ☐ I know a bit about grizzly bears in Montana
    - ☐ I know a fair amount about grizzly bears in Montana
    - ☐ I consider myself an expert on grizzly bears in Montana

37. Have you had any of the following interactions with grizzly bears? (*Please check all that apply.)*
    - ☐ I have watched a grizzly bear from afar at least once
    - ☐ I have seen a grizzly bear when I was not in a vehicle
    - ☐ I have seen a grizzly bear very close to my home
    - ☐ A grizzly bear has damaged my property at least once
    - ☐ I know people who have had their property damaged by grizzly bears at least once
    - ☐ I have had an interaction with a grizzly bear that made me fear for my safety
    - ☐ I have had none of these interactions

38. How would you characterize the area where you live? *(Please check only one box.)*
    - ☐ Rural (you live in the country)
    - ☐ Small town (less than 1,000 people)
    - ☐ Mid-sized town (between 1,000 and 5,000 people)
    - ☐ Large town (between 5,000 and 15,000 people)
    - ☐ City (greater than 15,000 people)

39. What is the highest level of school you have you completed? *(Please check only one box.)*
    - ☐ Grade school
    - ☐ High school / GED
    - ☐ Some college
    - ☐ College graduate
    - ☐ Post graduate

40. What year were you born? _____ (year)

41. What is your gender? *(Please check only one box.)*
    - ☐ Male
    - ☐ Female
    - ☐ Other_____
    - ☐ Prefer not to disclose

Thank you for taking this survey. If you have any comments, please include them in the space below:_____
_____
_____
_____
_____
_____
_____
_____

MARCH 2020

2020 PERCEPTIONS ABOUT AND MANAGEMENT OF GRIZZLY BEARS

Sampling and Weighting Summary

Prepared for Dr. Alex Metcalf, W.A. Franke College of Forestry & Conservation
Prepared by John Baldridge, Bureau of Business and Economic Research

BUREAU OF BUSINESS AND ECONOMIC RESEARCH
UNIVERSITY OF MONTANA

Contents

Sampling

Sampling was conducted using an addressed-based, stratified random sample purchased from Dynata, Inc. The study population was adults (ages 18+) who lived in an occupied dwelling that was listed on the U.S. Postal Service's Computerized Delivery Sequence File for Montana. This population differs slightly from all adults as it excludes institutionalized persons, homeless persons, and those absent during the survey period. The study population was 814,140 adult residents of Montana, as estimated by the 2018 U.S. Census Bureau American Community Survey 5-year data (U.S. Census Bureau, 2020). The sample was randomly selected in 2 strata:

1. All Montana census tracts except the 20 census tracts with the highest American Indian population
2. Only the 20 census tracts with the highest American Indian population

BBER sampled 4,650 addresses in stratum 1 and 700 addresses in stratum 2 for a total of 5,350 sampled addresses. The sample was stratified to ensure that an adequate number of survey completions would be obtained from American Indian citizens of Montana. The census tracts in stratum 2 were:

TABLE 1: STRATUM 2 CENSUS TRACTS

FIPS Tract Code
30047940301
30047940303
30047940400
30047940500
30047940600
30047940700
30005940100
30005940200
30015010300
30035940200
30035940400
30041940300
30073977200
30085940001
30085940002
30087940400
30003000100
30003940400
30003940600
30003940700

Sampling Error

The 1,758 responses obtained in this survey yielded a confidence interval of +/- 3.5%. This means that if the survey were administered 100 times, in 95 of the administrations a proportion of 50% would be found +/- 3.5%. Data users should take care to calculate confidence intervals and standard errors for these survey estimates using a modern statistical software package that can account for the complex design of the survey as opposed to using older survey analysis practices that assume unweighted, simple random sampling.

For reference, Table 2 presents population totals and 95% confidence intervals the study's main geographic divisions.

TABLE 2: STUDY POPULATIONS AND 95% CONFIDENCE INTERVALS

	Montana	Urban	Rural	In grizzly bear range	Out of grizzly bear range
Area population	814,140	517,795	296,345	437,348	376,792
95% confidence interval	+/- 3.5%	+/- 4.4%	+/- 5.8%	+/- 4.8%	+/- 5.2%

Table 3 lists the counties that comprise urban areas for this study. This definition is set by the U.S. Office of Management and Budget (Executive Office of the President, Office of Management and Budget, 2018).

TABLE 3: DESIGNATED URBAN AREAS

CBSA Title	Metropolitan/ Micropolitan Statistical Area	County/ County Equivalent
Billings, MT	Metropolitan Statistical Area	Yellowstone County
Great Falls, MT	Metropolitan Statistical Area	Cascade County
Missoula, MT	Metropolitan Statistical Area	Missoula County
Bozeman, MT	Micropolitan Statistical Area	Gallatin County
Butte-Silver Bow, MT	Micropolitan Statistical Area	Silver Bow County
Helena, MT	Micropolitan Statistical Area	Lewis and Clark County
Kalispell, MT	Micropolitan Statistical Area	Flathead County

The list of census tracts that comprise the grizzly bear range were provided by Dr. Alex Metcalf and Holly Nesbitt of the University of Montana's W.A. Franke College of Forestry & Conservation.

Data Set Preparation

Following collection and data entry appropriate data labels were added as well as composite variables and flags to facilitate analysis. Missing values for the weighting variables, necessary for comparison to the 2018 ACS 5-year estimates, were imputed using the multiple imputation method (Berglund & Heeringa, 2014) (Rubin, 1987). Data were processed using three statistical software packages: IBM SPSS Statistics Version 25 (2017), SAS Version 9.4 (2016), and Statistics Canada's G-EST Version 2.01.004 (2019).

Weighting

The estimates presented in this survey are produced using survey weights. Survey weights improve the accuracy of estimates and help to ensure that the survey is representative of the study population. The consensus in the scientific literature is that correctly constructed and applied weights should be used to produce statistics that describe survey data. (Kish & Frankel, 1974) (Rao, Hidiroglou, Yung, & Kovacevic, 2010) (Valliant, Dever, & Kreuter, 2013) (Battaglia, et al., 2016) (Haziza & Beaumont, 2017)

Weights for the survey were calculated using a three-step process that is also widely accepted in survey research literature. (Haziza & Beaumont, 2017) (Battaglia, et al., 2016) (Haziza & Lesage, 2016) (Lavallee & Beaumont, 2016) (Valliant, Dever, & Kreuter, 2013) In step 1 a base weight was calculated to account for the probability of selection of each individual in the sample. The population control total was based on the U.S. Census Bureau's American Community Survey 2018 5-year estimate for the population of persons age 18 and older (U.S. Census Bureau, 2020). In step 2 the base weight was modified to adjust for nonresponse. (Haziza & Lesage, 2016) (Battaglia, et al., 2016) (Brick, 2013) (Kreuter & Olson, 2013) (Olson, 2013) (Valliant, Dever, & Kreuter, 2013) In step 3 the nonresponse-adjusted weight was calibrated to population control totals derived from the U.S. Census Bureau's American Community Survey 2018 5-year estimates for the population of persons age 18 and older (Haziza & Beaumont, 2017) (Lavallee & Beaumont, 2016) (Valliant, Dever, & Kreuter, 2013) (Sarndal, 2007) (Kalton & Flores-Cervantes, 2003).

Survey weight calibration was conducted using the Gest_Calibration module of Generalized Estimation System version 2.01.004 (January 2019) developed by Statistics Canada. The survey weight was calibrated to population control totals by:

1. Sampling strata
2. Urban and rural counties
3. Within and outside grizzly bear range
4. Gender
5. Age
6. Educational attainment

BBER provided one survey weight in the dataset: a population weight useful for estimating the number of adults in the study population who have a particular characteristic. In addition, BBER provided in the dataset the variables required for a modern statistical package to calculate standard errors and confidence intervals.

Respondent Characteristics

Table 4 below describes the 1,758 respondents. 2018 U.S. Census Bureau American Community Survey 5-year population proportions (ages 18 +) for the study population of 814,140 persons are provided for context.

TABLE 4: SURVEY RESPONDENT CHARACTERISTICS

Characteristic		2018 ACS 5-Year Estimate (%)	Unweighted Responses (%)	Weighted Responses (%)
Gender	Female	50.0%	35.8%	49.95%
	Male	50.0%	64.1%	49.95%
	Other		0.1%	0.1%
Age	18-34	28.5%	10.5%	28.5%
	35-49	22.1%	19.0%	22.1%
	50-64	26.8%	32.7%	26.8%
	65+	22.6%	37.8%	22.6%
Educational attainment	HS diploma or less	37.5%	18.8%	37.5%
	Some college or AA degree	34.1%	26.7%	34.1%
	Bachelor's degree or more	28.4%	54.5%	28.4%
Urban or rural area	Urban	63.6%	64.5%	63.6%
	Rural	36.4%	35.5%	36.4%
Grizzly bear range	Within the range	53.7%	57.8%	53.7%
	Outside the range	46.3%	42.2%	46.3%

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Results

There were a total of 1,783 respondents. Initial sample totalled 5,350, with 688 being returned by the US Postal Service as undeliverable. Thus, final response rate was 38.2%. See weighting report above for non-response modelling and weighting methodology.

The following figures and tables summarize the results of the questionnaire using weighted responses. Thus, these results represent the mean scores for all MT residents. Sample sizes may differ for each question based on question non-response.

Question 1

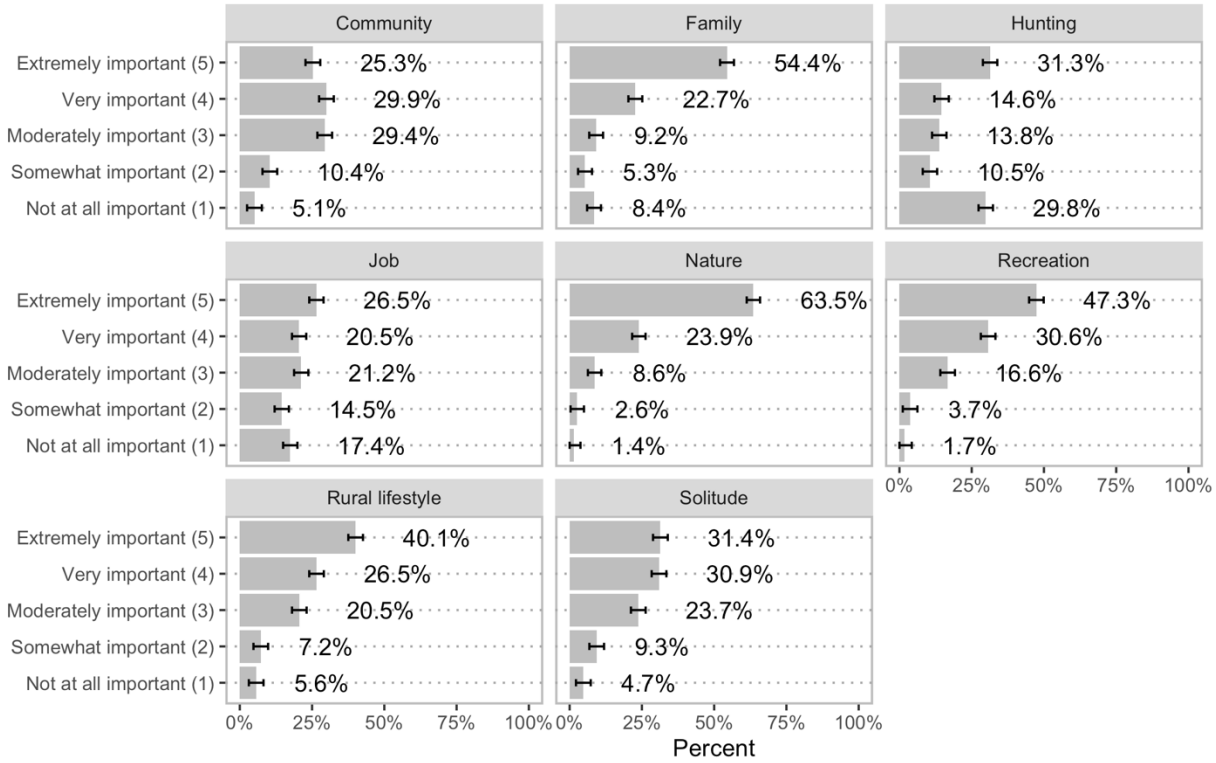

Figure 1: The importance of possible reasons for respondents living in MT.

Table 1: Mean, standard deviation, and sample size regarding the importance of different reasons for living in MT.

Question	Mean	Standard Deviation	Sample Size
Family	4.09	1.26	1705
Solitude	3.75	1.13	1699
Recreation	4.18	0.95	1710
Rural lifestyle	3.88	1.18	1701
Job	3.24	1.43	1658
Community	3.60	1.12	1677
Hunting	3.07	1.64	1683
Nature	4.46	0.86	1707

Question 2

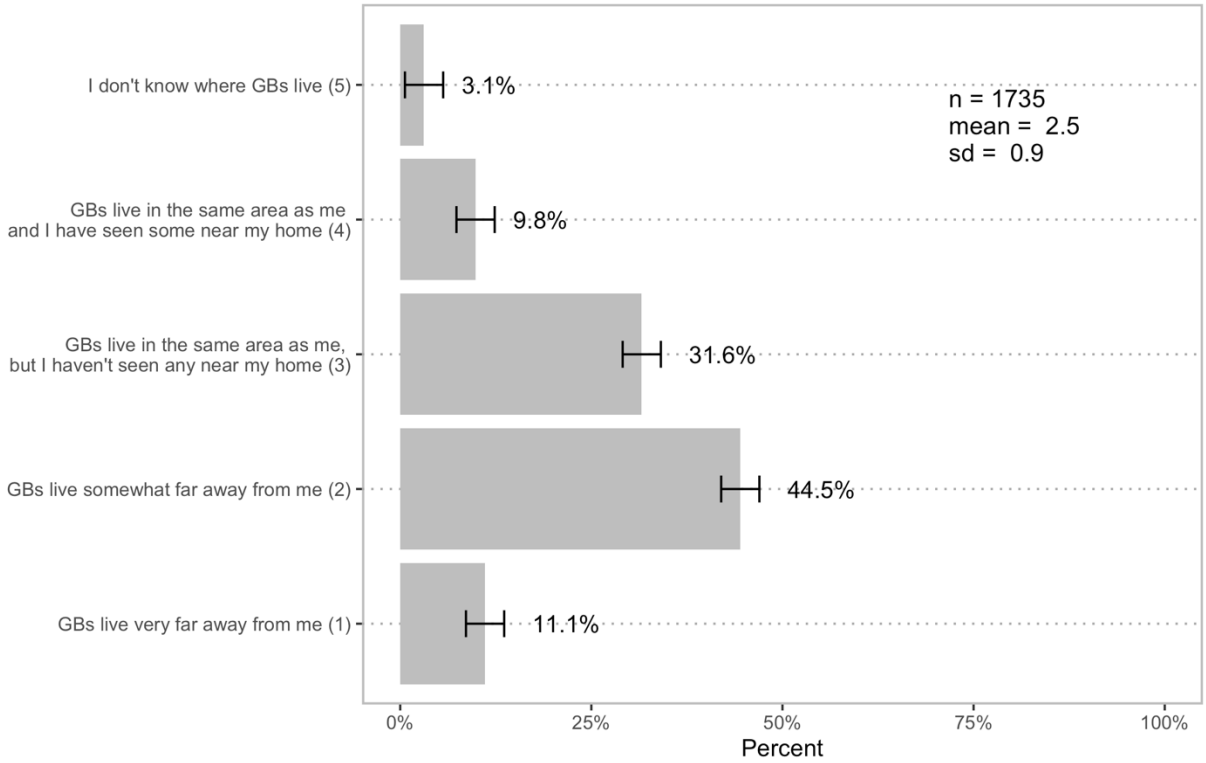

Figure 2: Where respondents believe grizzly bears (GBs) live.

Question 4

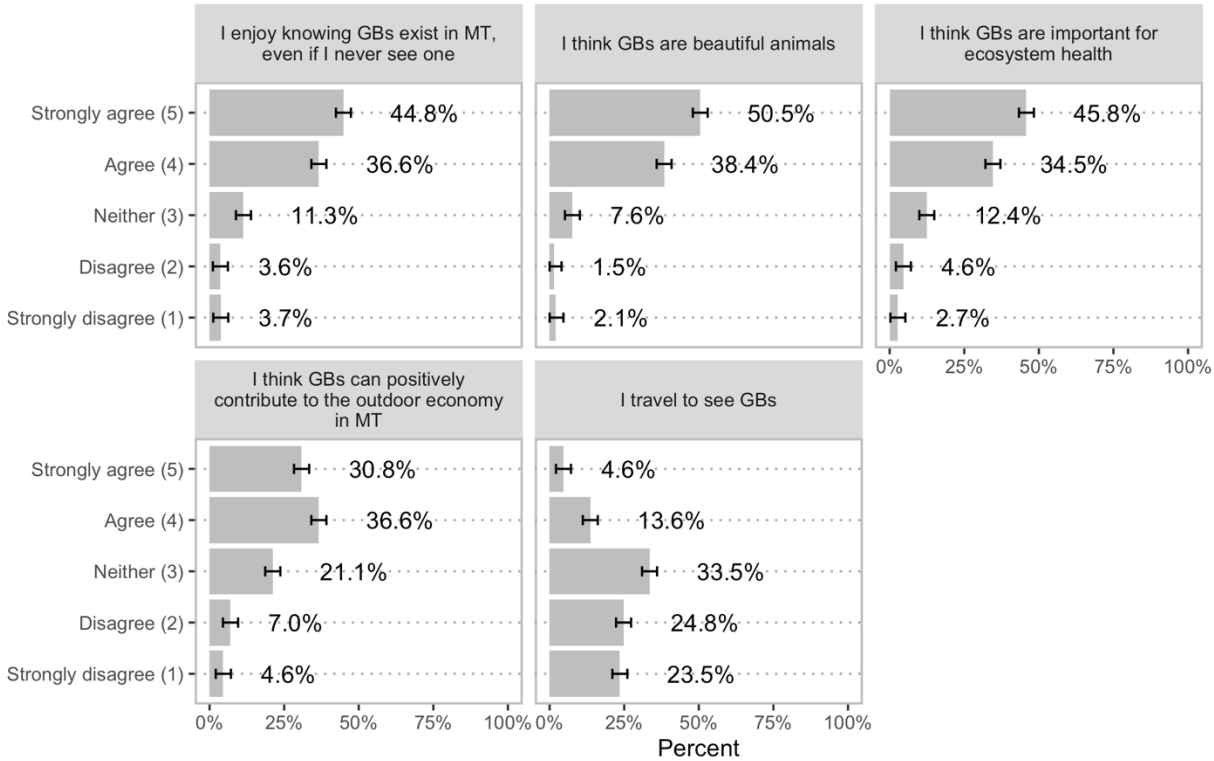

Figure 3: Level of agreement or disagreement with each statement about GBs.

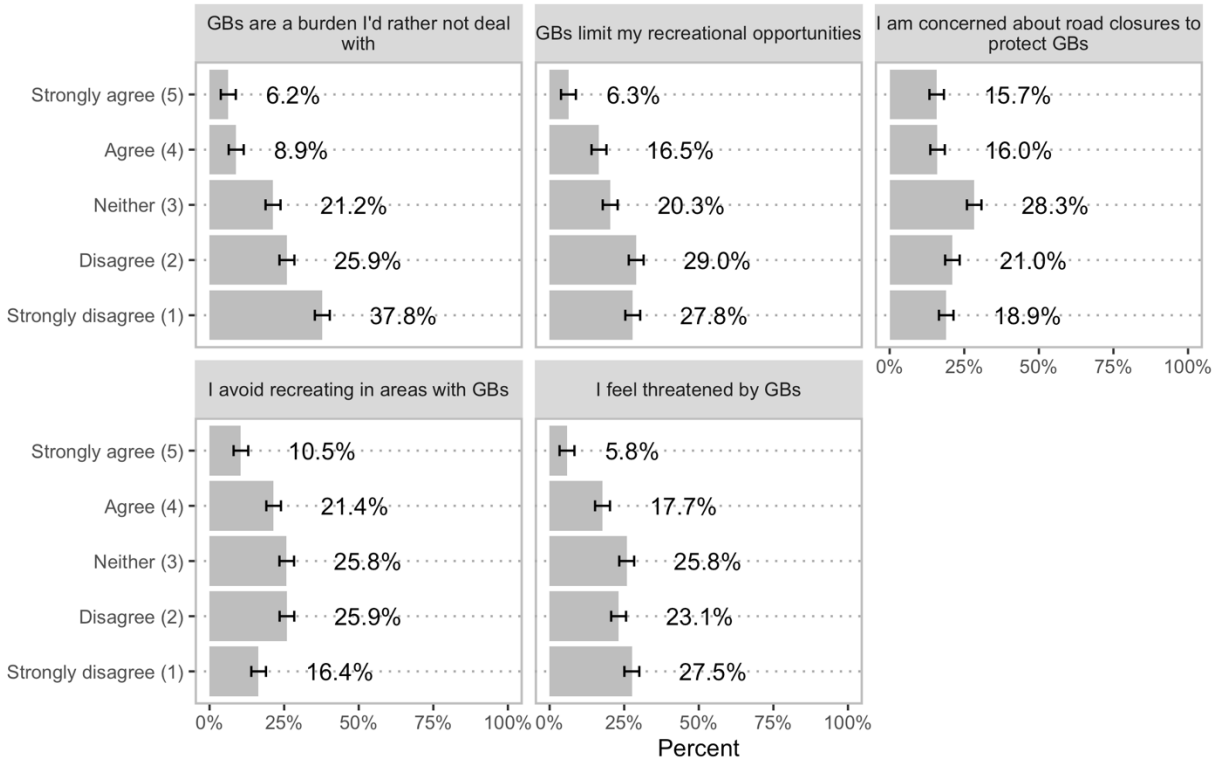

Figure 4: Level of agreement or disagreement with each statement about GBs.

Table 2: Mean, standard deviation, and sample size regarding the level of agreement or disagreement with each statement about GBs.

Question	Mean	Standard Deviation	Sample Size
I feel threatened by GBs	2.51	1.23	1688
I think GBs are beautiful animals	4.34	0.85	1693
GBs limit my recreational opportunities	2.44	1.23	1693
I travel to see GBs	2.51	1.13	1689
GBs are a burden I'd rather not deal with	2.20	1.21	1688
I think GBs are important for ecosystem health	4.16	0.99	1703
I avoid recreating in areas with GBs	2.84	1.23	1703
I enjoy knowing GBs exist in MT, even if I never see one	4.15	1.01	1706
I am concerned about road closures to protect GBs	2.89	1.32	1700
I think GBs can positively contribute to the outdoor economy in MT	3.82	1.08	1699

Question 5

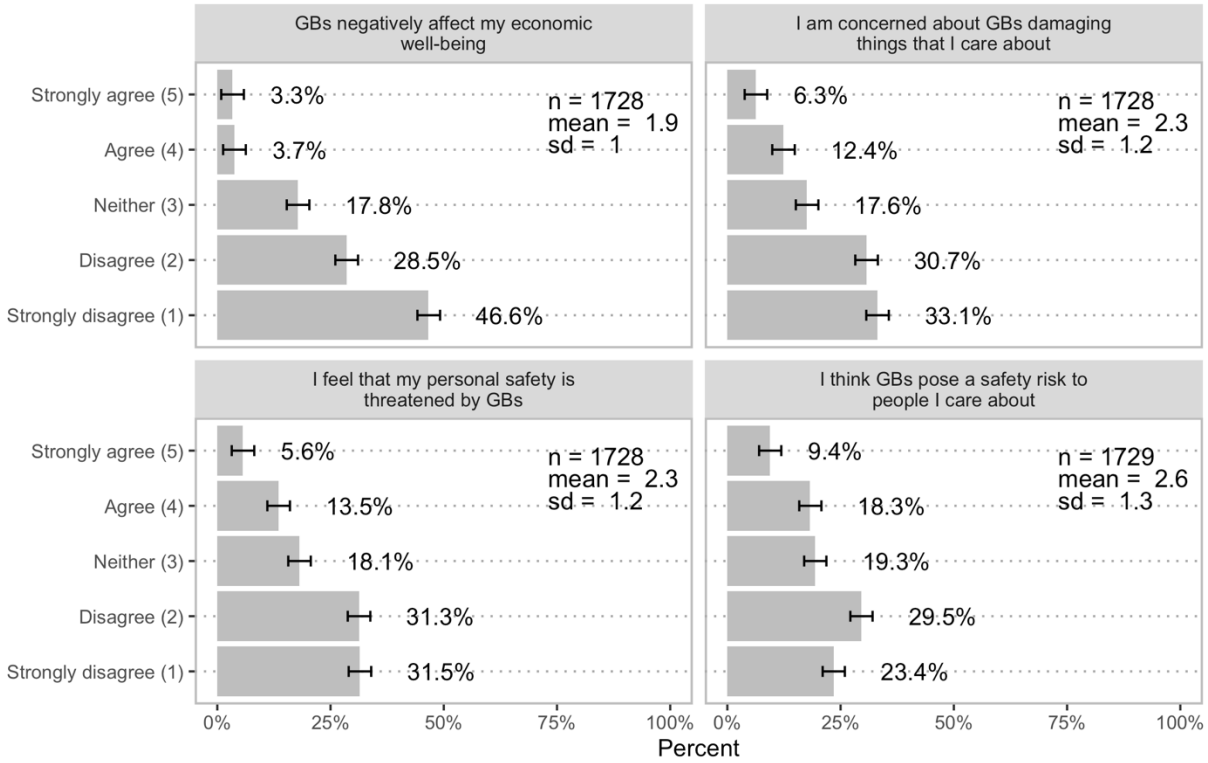

Figure 5: Level of agreement or disagreement with each statement about GBs.

Question 6

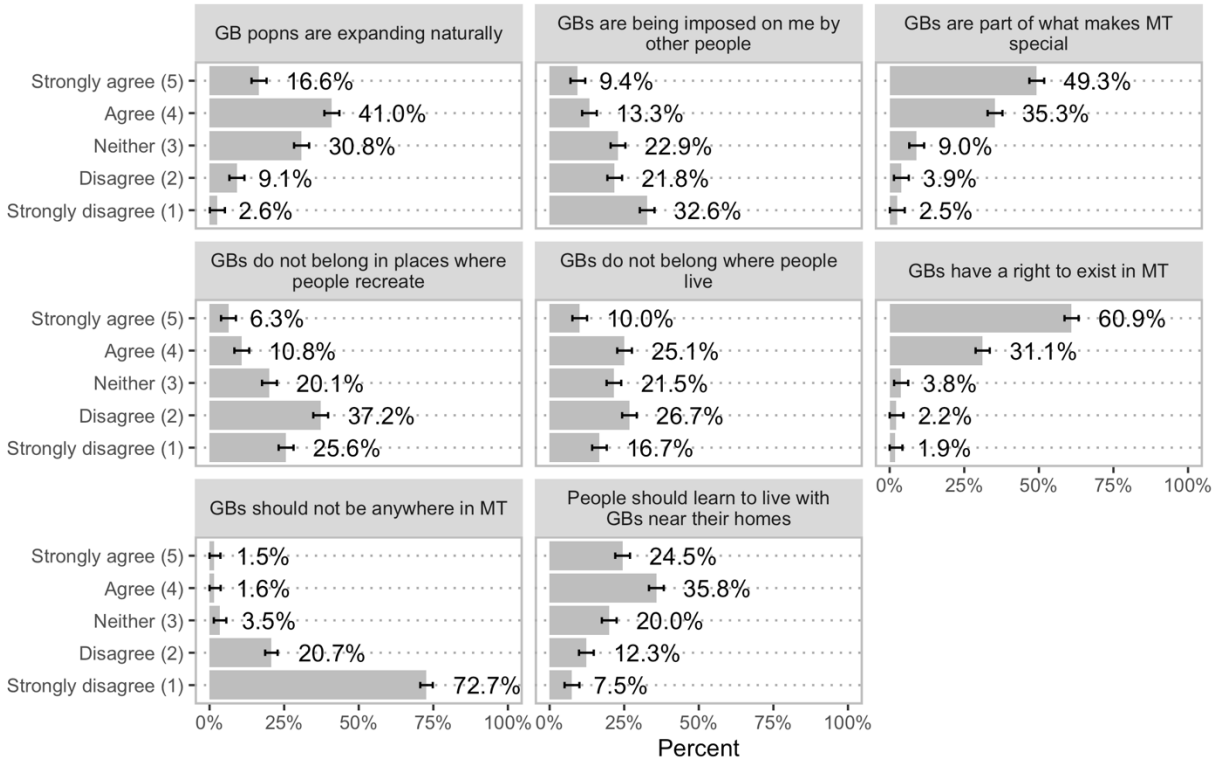

Figure 6: Level of agreement or disagreement with each statement about GBs.

Table 3: Mean, standard deviation, and sample size regarding the level of agreement or disagreement with each statement about GBs.

Question	Mean	Standard Deviation	Sample Size
GBs do not belong where people live	2.85	1.25	1712
GBs have a right to exist in MT	4.47	0.83	1730
GBs do not belong in places where people recreate	2.35	1.16	1723
GB popns are expanding naturally	3.60	0.95	1716
GBs should not be anywhere in MT	1.39	0.77	1721
People should learn to live with GBs near their homes	3.57	1.20	1721
GBs are being imposed on me by other people	2.45	1.32	1715
GBs are part of what makes MT special	4.25	0.95	1728

Question 7 and 8

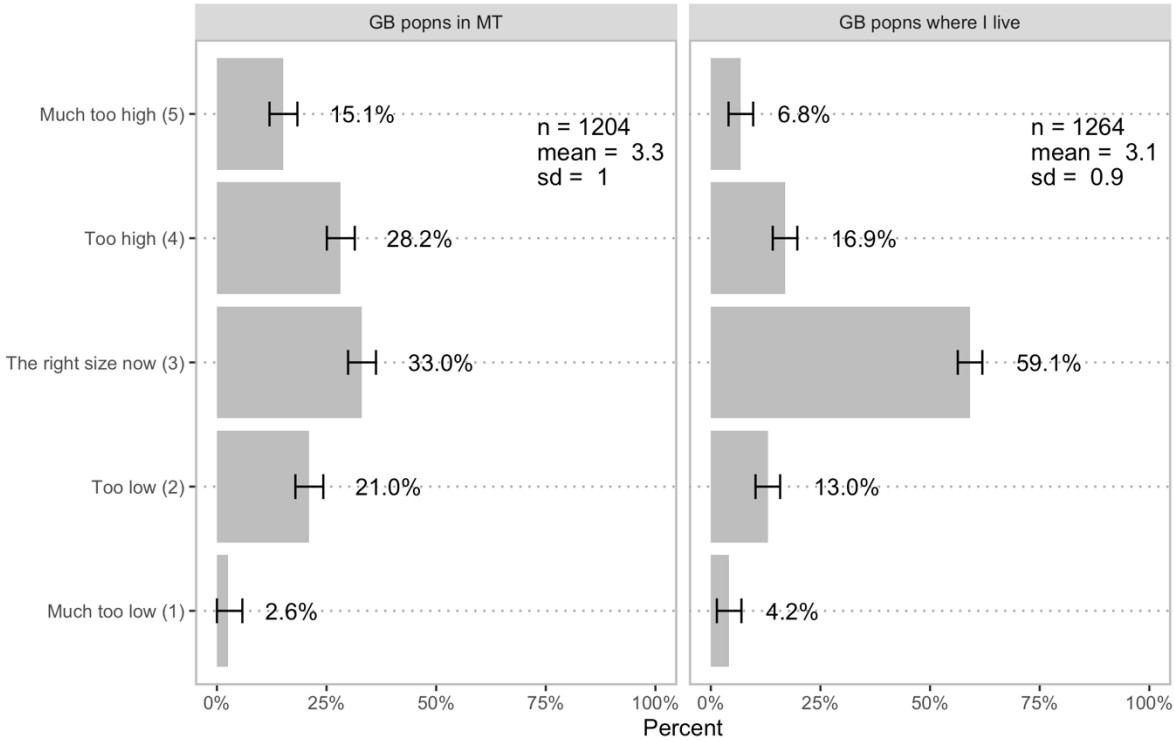

Figure 7: What respondents think of GB population (popn) sizes right now.

Question 9

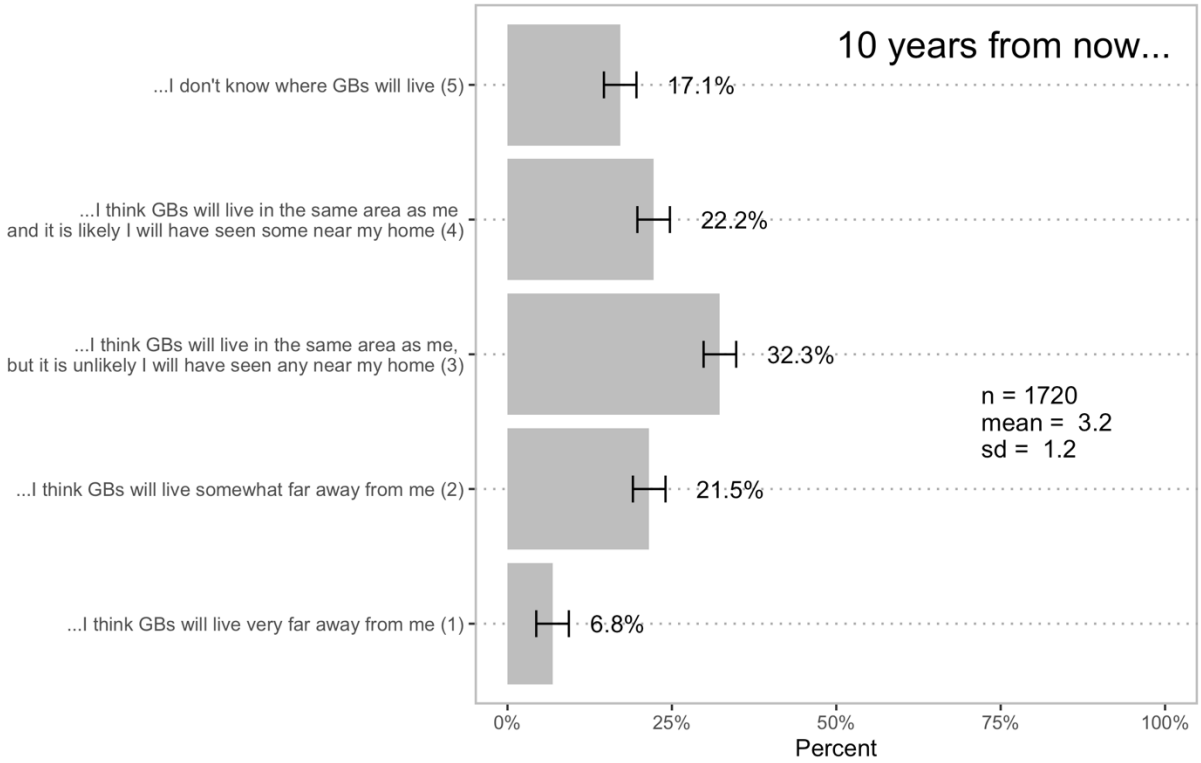

Figure 8: Where respondents think GBs will live ten years from now.

Question 10

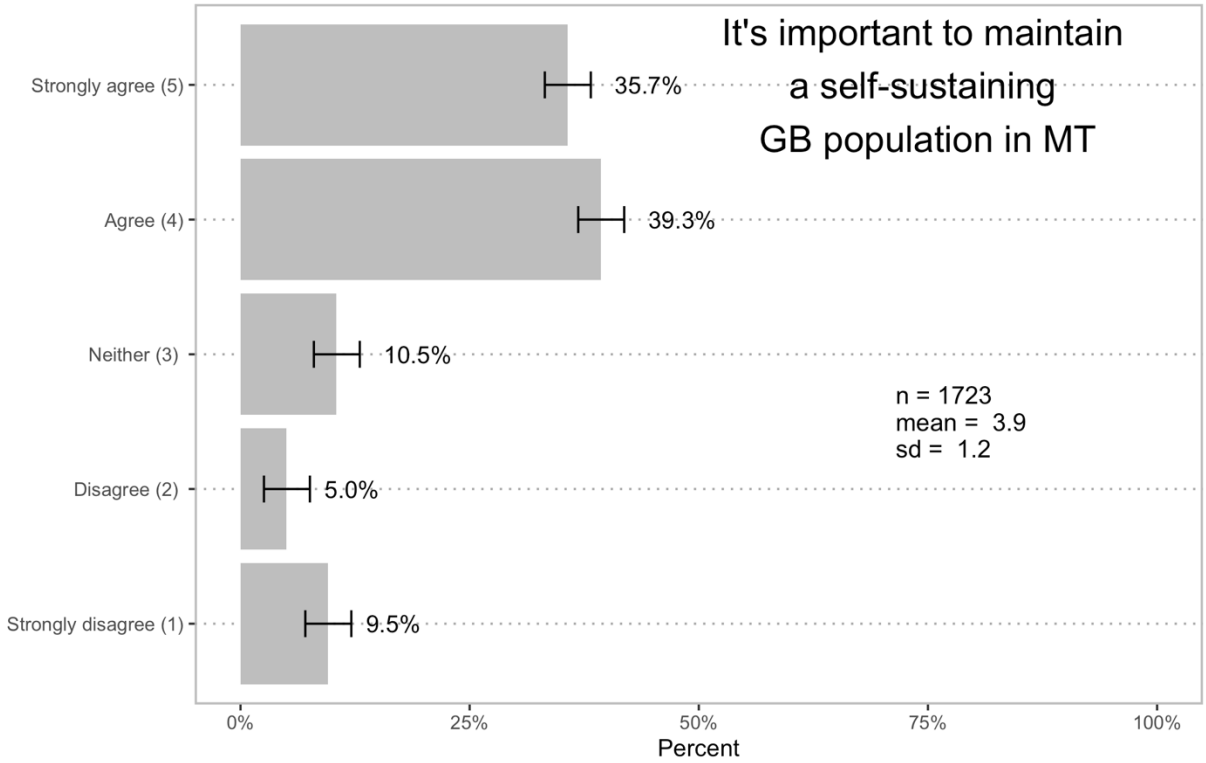

Figure 9: Level of agreement or disagreement with the statement about GBs.

Question 12 and 13

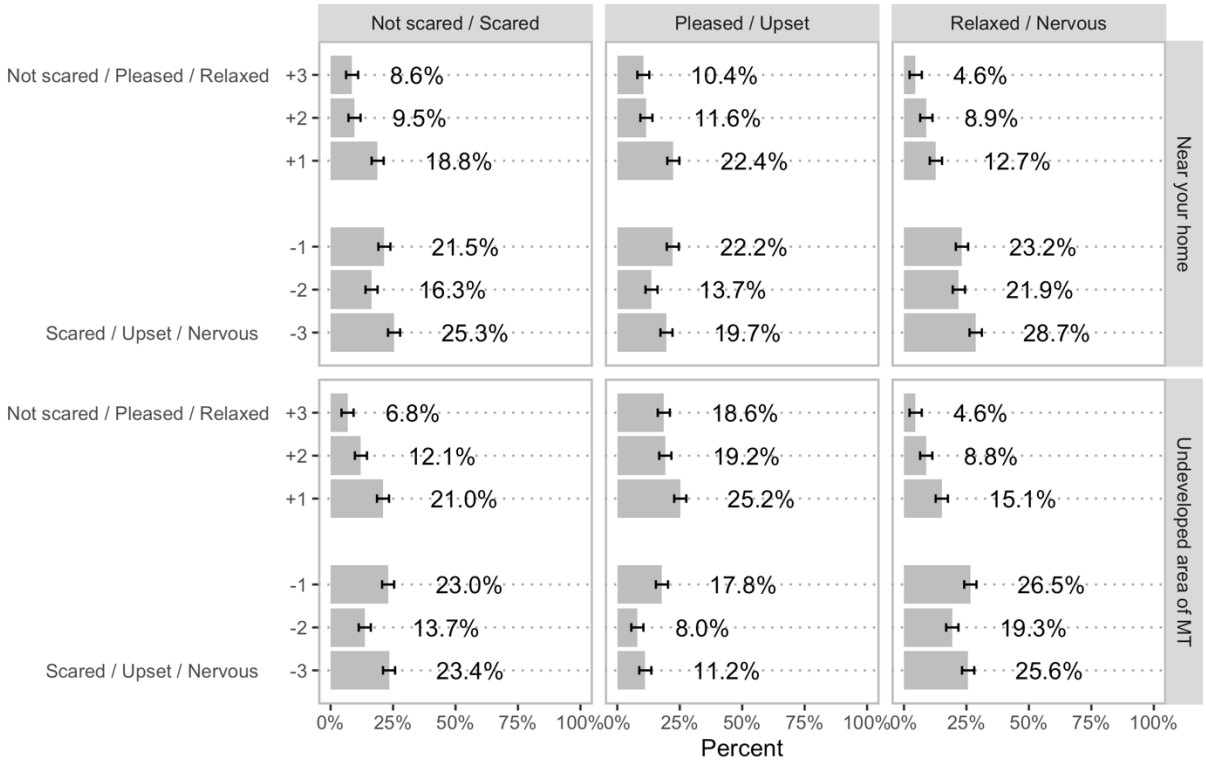

Figure 10: Emotional response to GBs under two different scenarios – one near the respondent's home and the other on in an undeveloped area of the state. The top panel are responses to the prompt: "If you were on a walk near your home and saw a grizzly bear in the distance, to what extent would you feel…". The bottom panel are responses to the prompt: "If you were on a hike in an undeveloped area of the state and saw a grizzly bear in the distance, to what extent would you feel…". Respondents were asked to indicate how they would feel across three different scales of nervous to relaxed, upset to pleased, and scared to not scared using the -3 to +3 scale, where -3 is nervous and +3 is relaxed, -3 is upset and +3 is pleased, and -3 is scared and +3 is not scared.

Table 4: Mean, standard deviation, and sample size for each emotional reaction in each scenario.

Scenario	Emotion	Mean	Standard Deviation	Sample Size
Undeveloped area of the state	Nervous / Relaxed	-0.95	1.83	1699
	Upset / Pleased	0.52	1.98	1660
	Scared / Not scared	-0.55	1.97	1682
Near your home	Nervous / Relaxed	-1.09	1.85	1700
	Upset / Pleased	-0.32	2.02	1673
	Scared / Not scared	-0.67	2.01	1680

Question 14

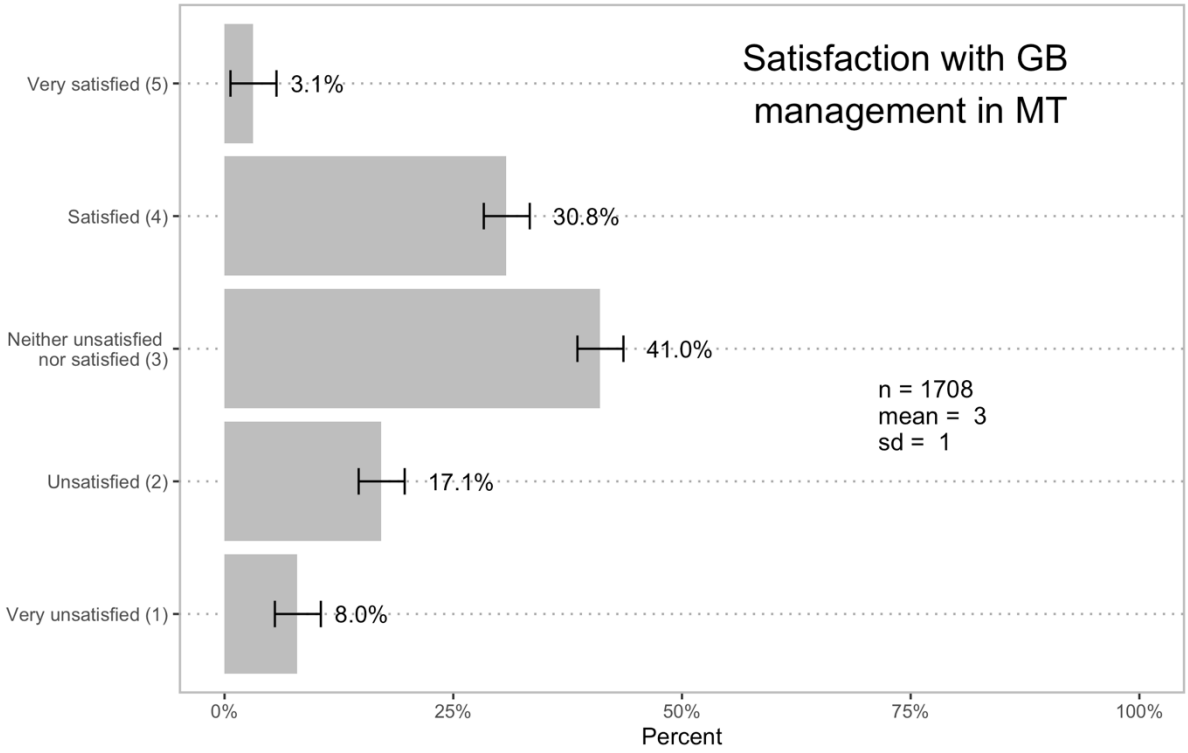

Figure 11: Level of satisfaction or dissatisfaction with GB management in MT.

Question 15

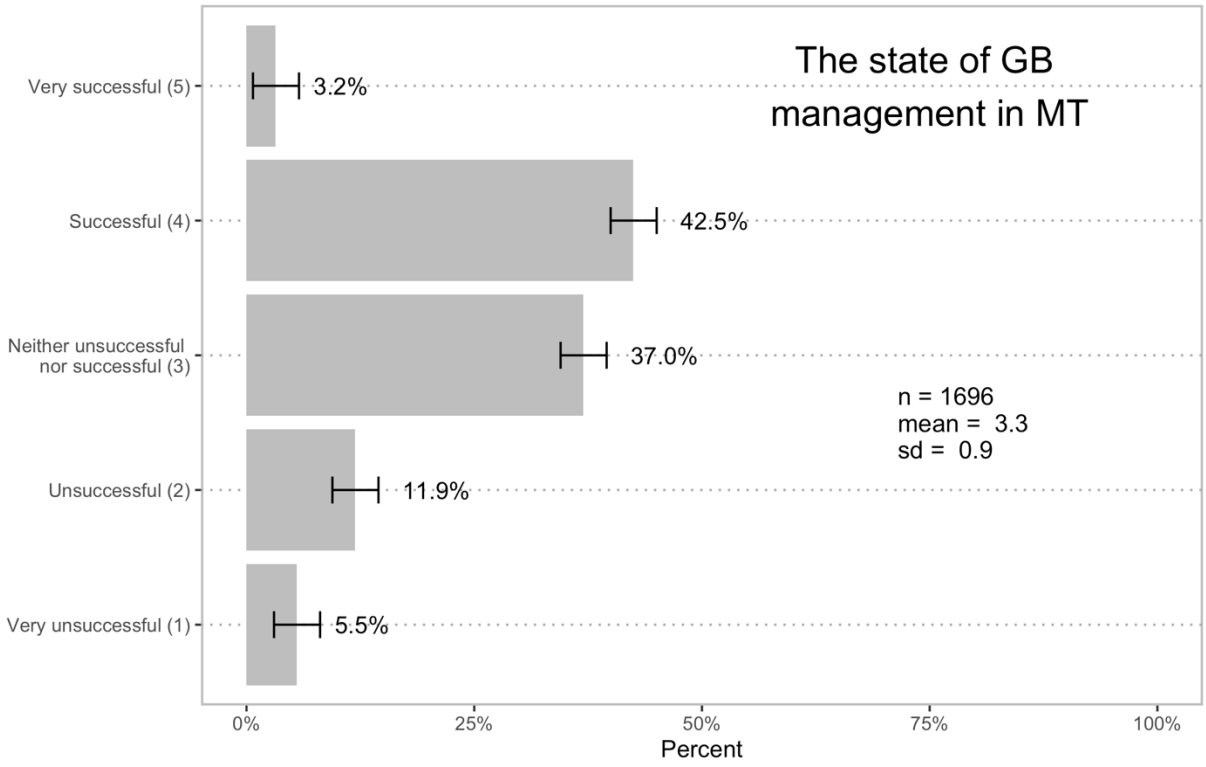

Figure 12: How successful or unsuccessful respondents view GB management in MT.

Question 16

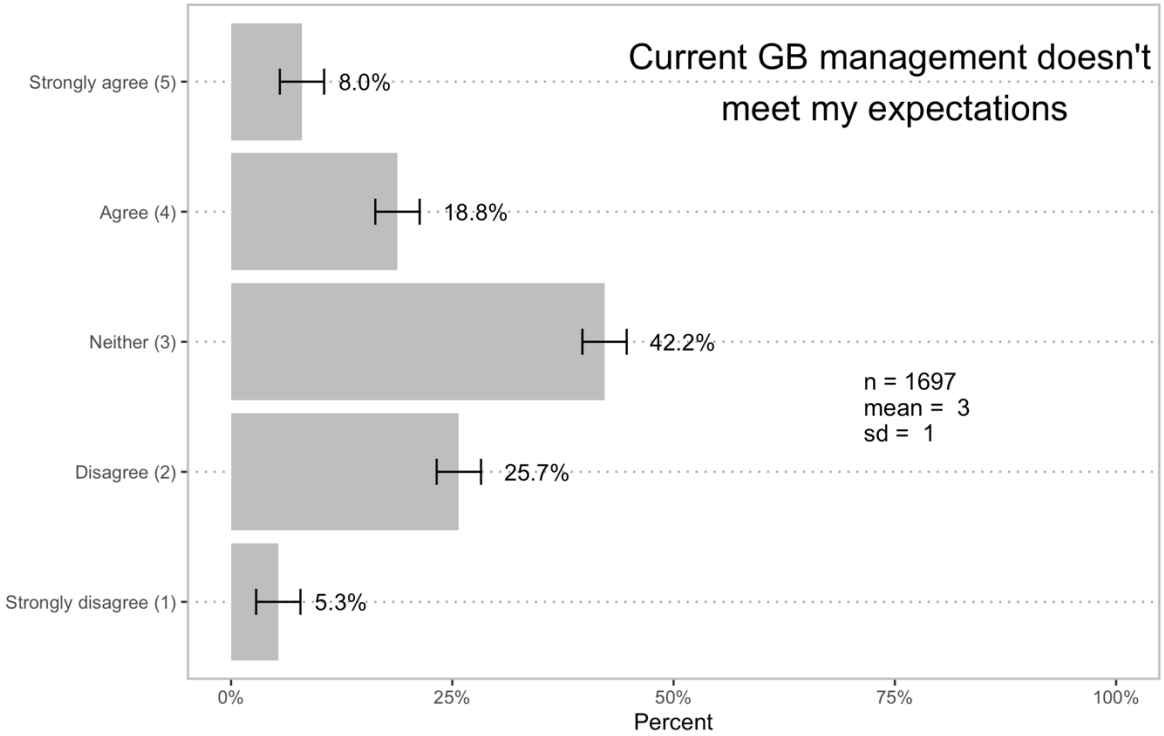

Figure 13: Level of agreement or disagreement with the statement about GB management.

Question 17

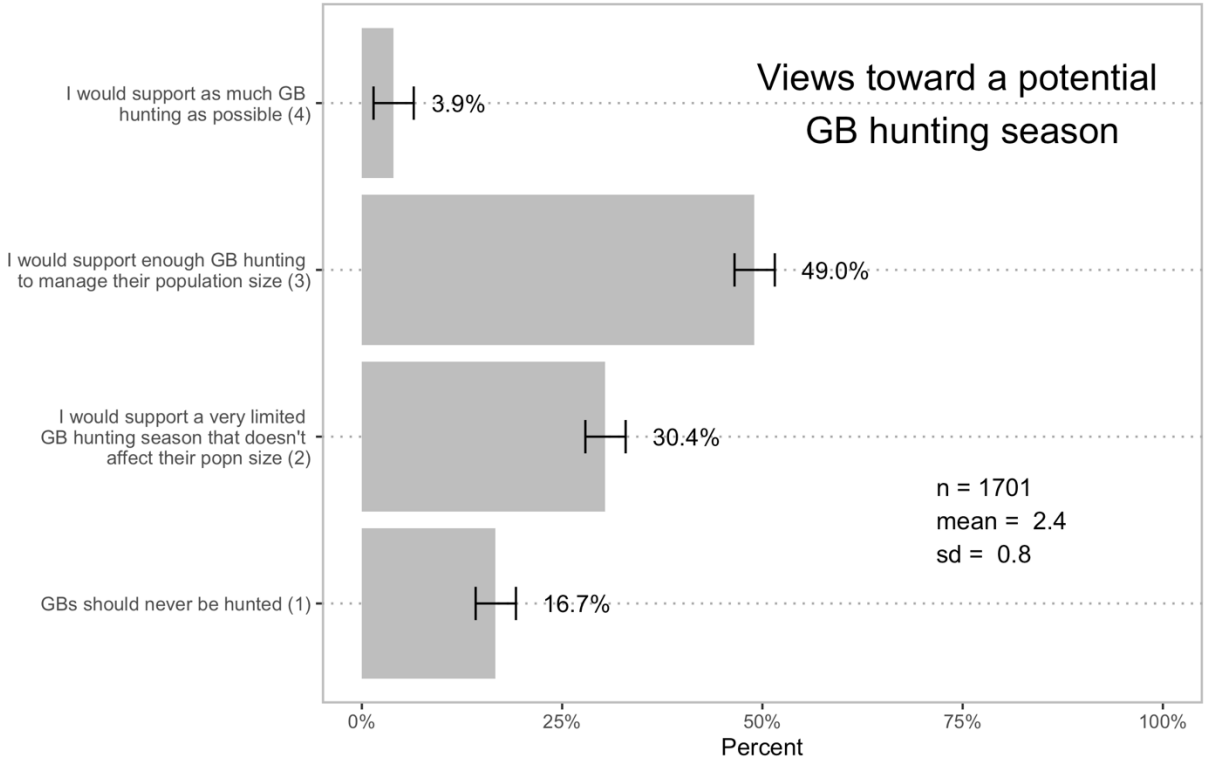

Figure 14: Views toward a potential GB hunting season.

Question 18, 19, and 23

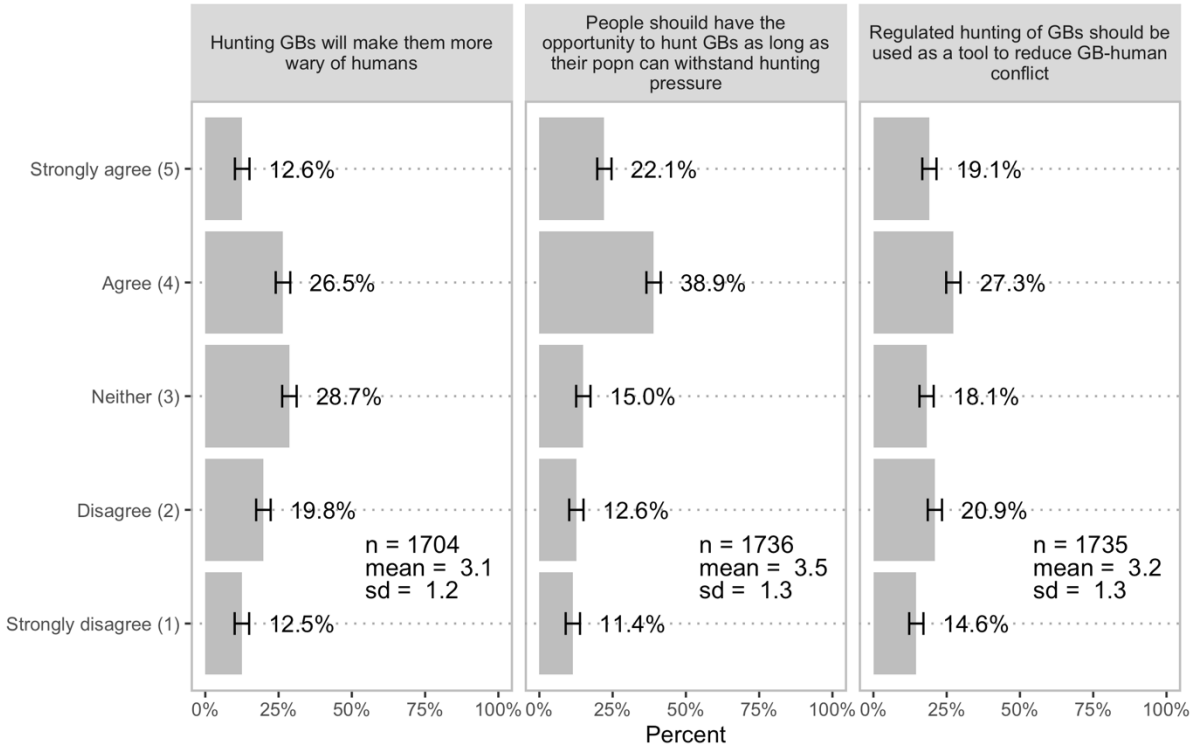

Figure 15: Views toward hunting GBs.

Question 20

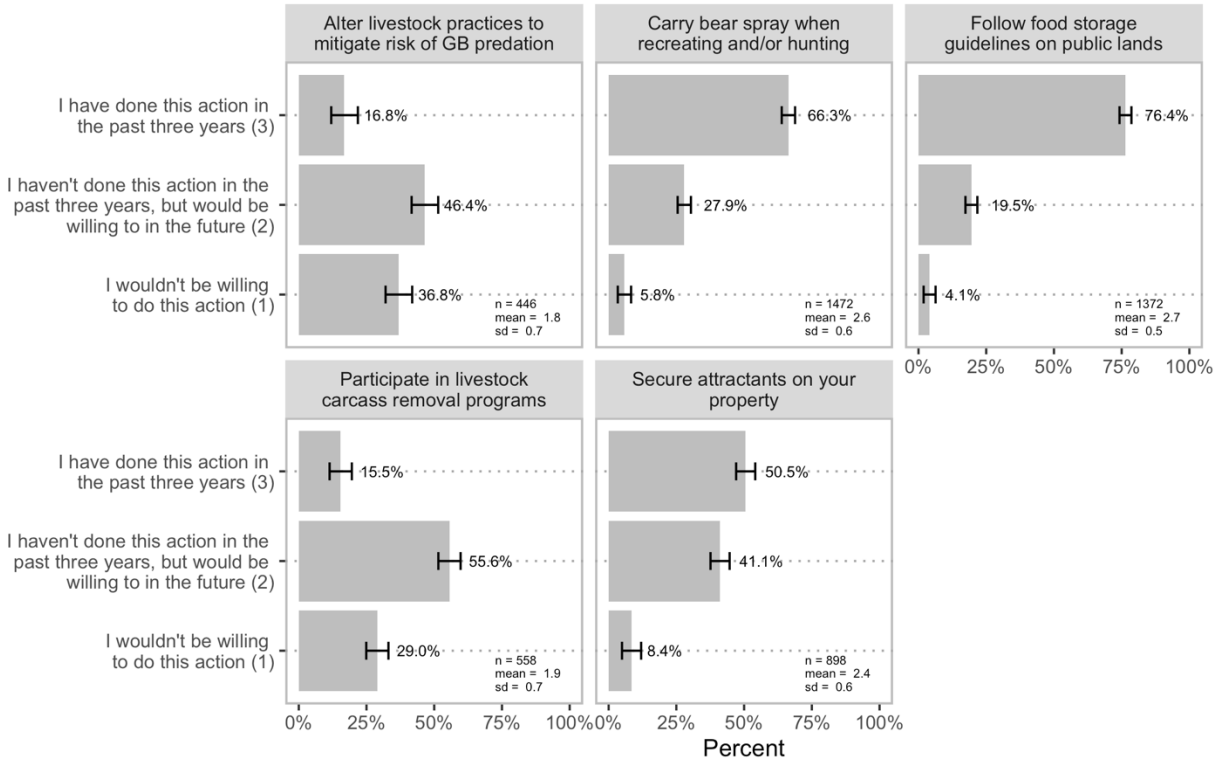

Figure 16: Whether respondents have or would be willing to practise bear-friendly behavior.

Question 21

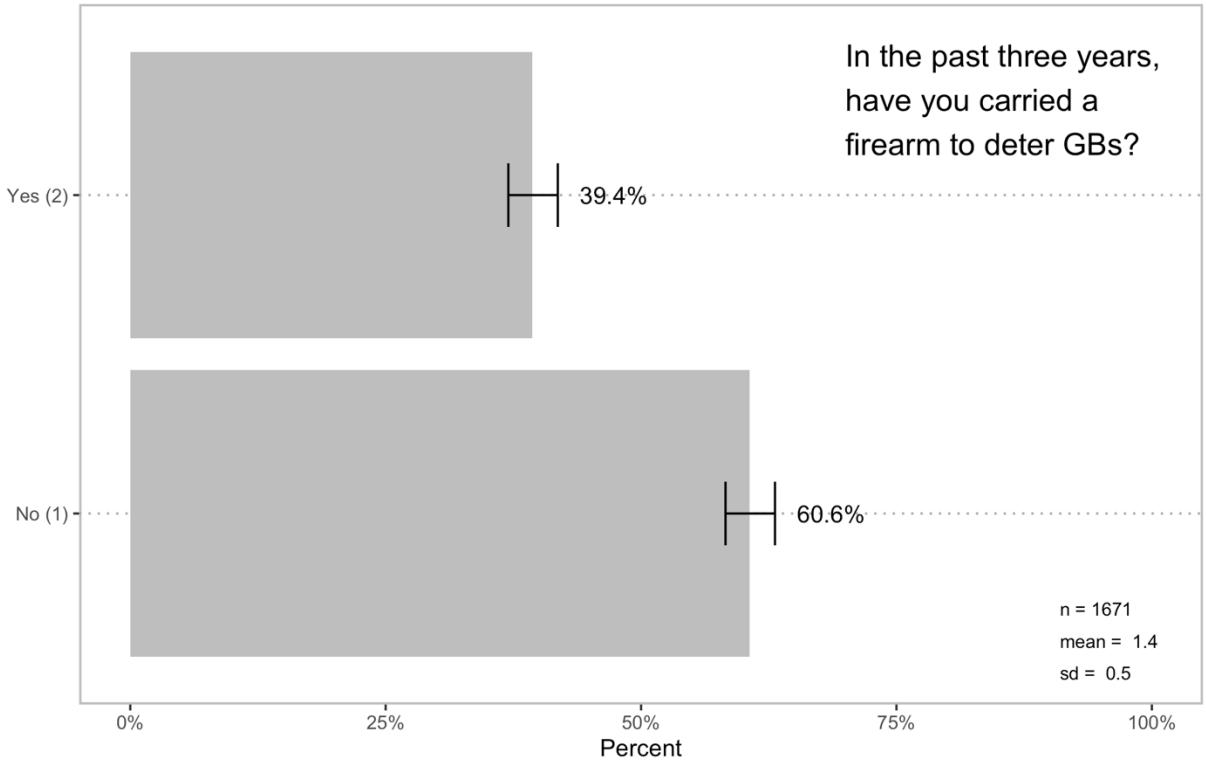

Figure 17: Whether or not respondents have carried a firearm in the last three years to deter GBs.

Question 22

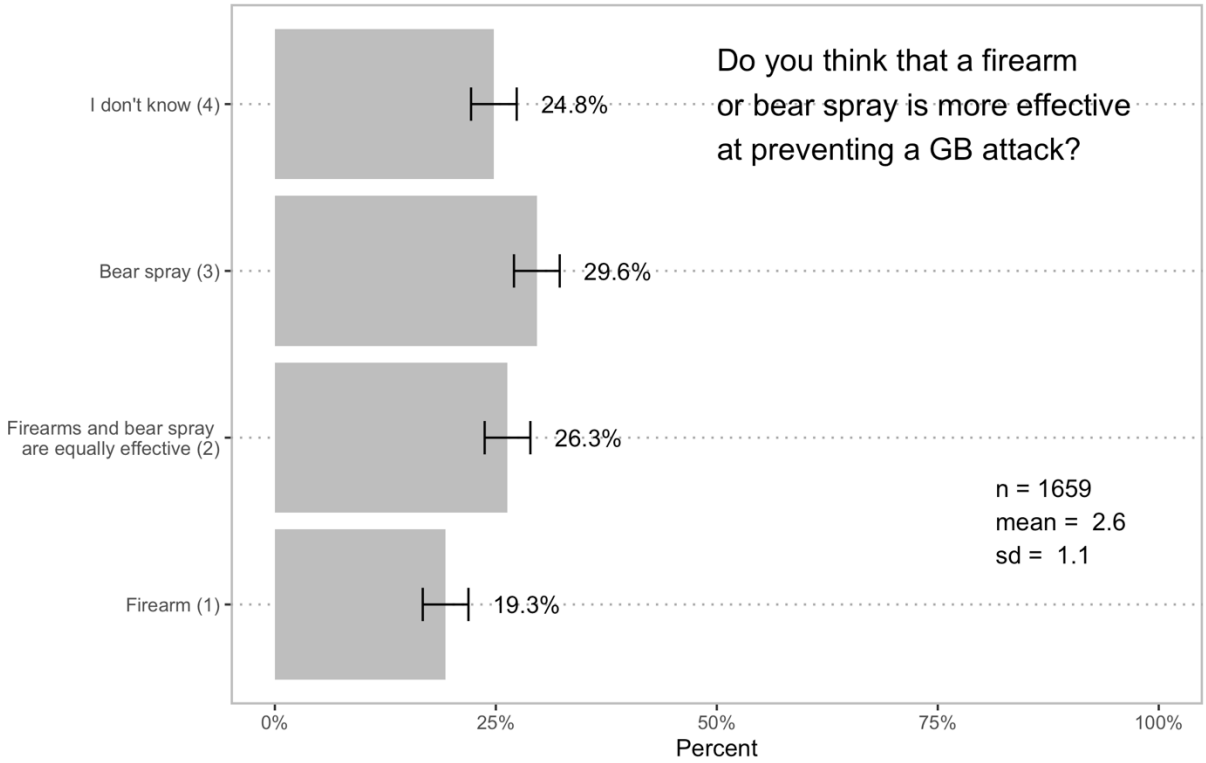

Figure 18: Opinions on the relative effectiveness of bear spray and firearms to prevent GB attacks.

Question 24

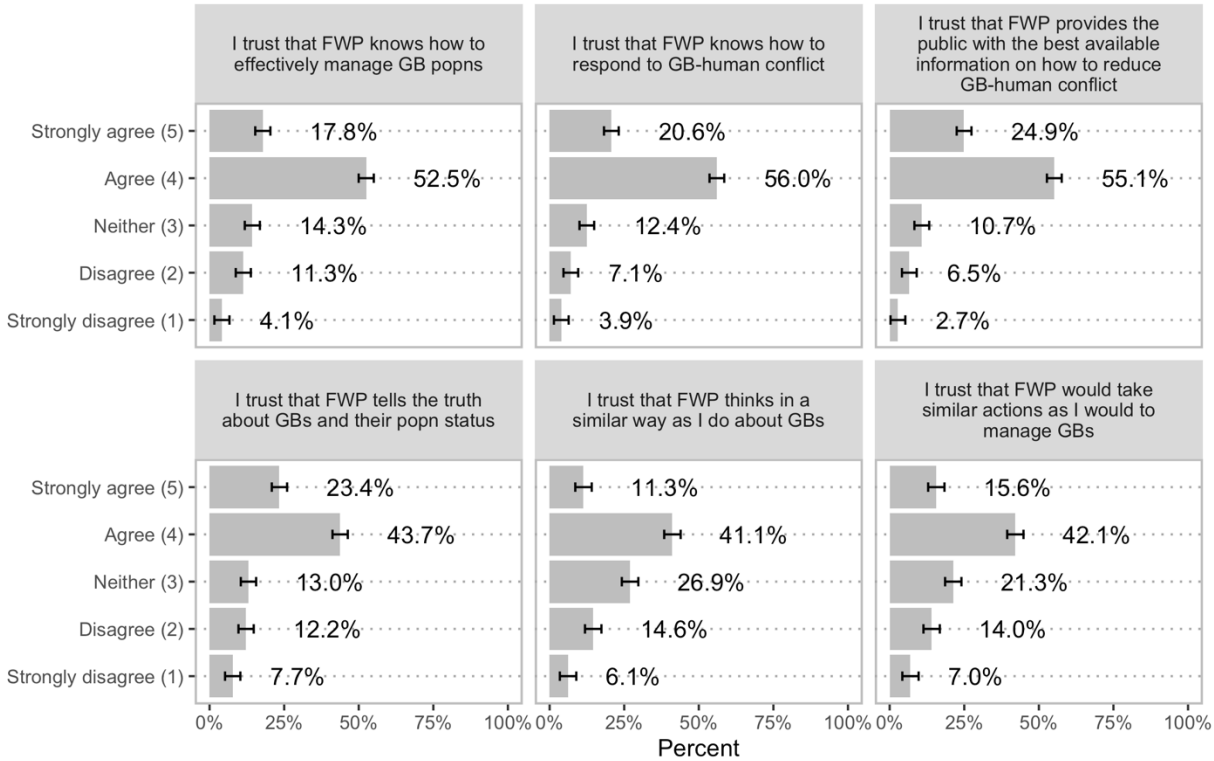

Figure 19: Level of agreement or disagreement with each statement about the MT Department of Fish, Wildlife, and Parks (FWP).

Table 5: Mean, standard deviation, and sample size regarding the level of agreement or disagreement with each statement about FWP.

Question	Mean	Standard Deviation	Sample Size
I trust that FWP knows how to effectively manage GB popns	3.69	1.02	1563
I trust that FWP thinks in a similar way as I do about GBs	3.37	1.06	1406
I trust that FWP knows how to respond to GB-human conflict	3.83	0.97	1631
I trust that FWP provides the public with the best available information on how to reduce GB-human conflict	3.93	0.93	1639
I trust that FWP tells the truth about GBs and their popn status	3.63	1.19	1576
I trust that FWP would take similar actions as I would to manage GBs	3.45	1.12	1409

Question 25

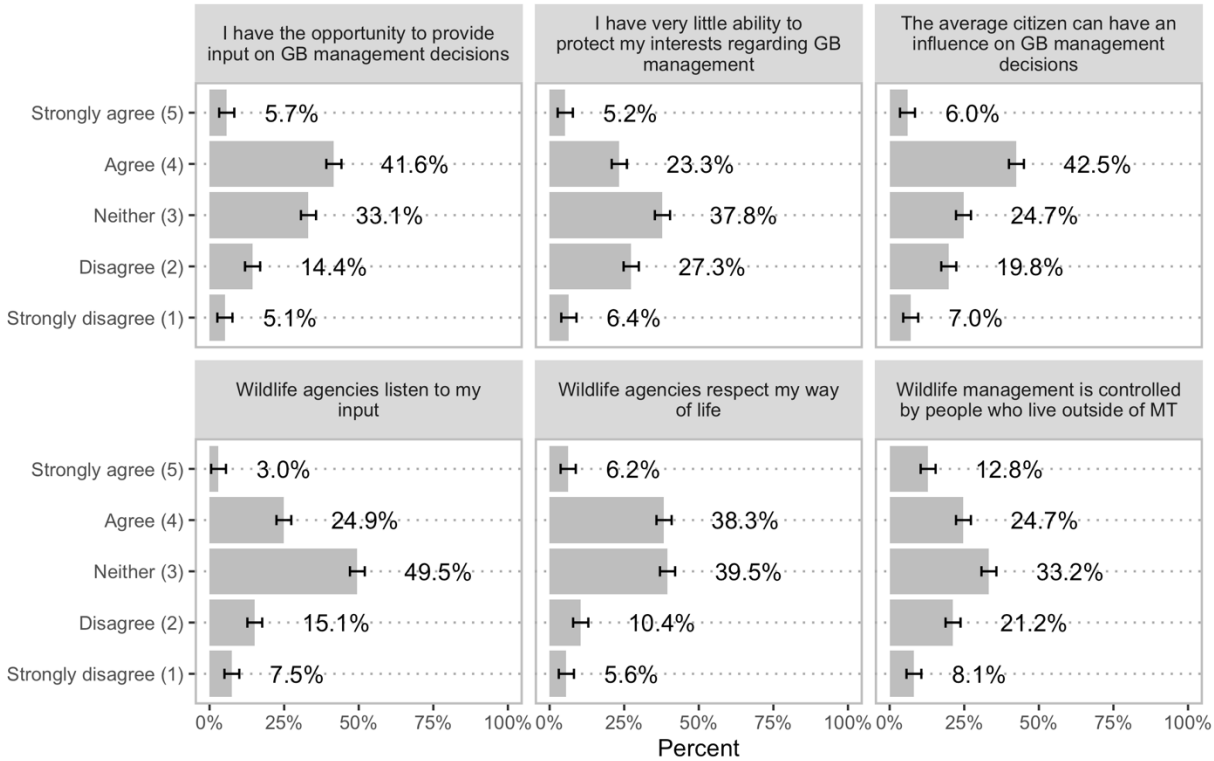

Figure 20: Level of agreement or disagreement with each statement about wildlife management.

Table 6: Mean, standard deviation, and sample size regarding the level of agreement or disagreement with each statement about wildlife management.

Question	Mean	Standard Deviation	Sample Size
The average citizen can have an influence on GB management decisions	3.21	1.05	1699
I have very little ability to protect my interests regarding GB management	2.94	0.98	1692
I have the opportunity to provide input on GB management decisions	3.28	0.96	1698
Wildlife agencies listen to my input	3.01	0.91	1684
Wildlife agencies respect my way of life	3.29	0.94	1692
Wildlife management is controlled by people who live outside of MT	3.13	1.13	1688

Question 26

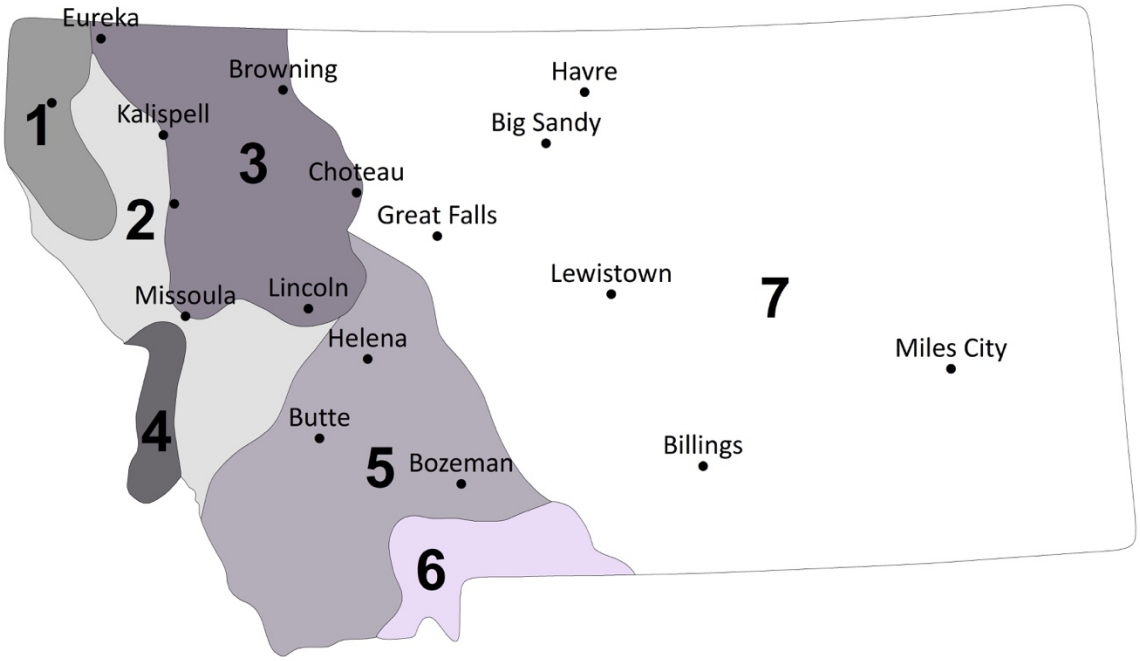

Figure 21: The map of MT used in the survey. Numbers correspond to the areas in the figure below.

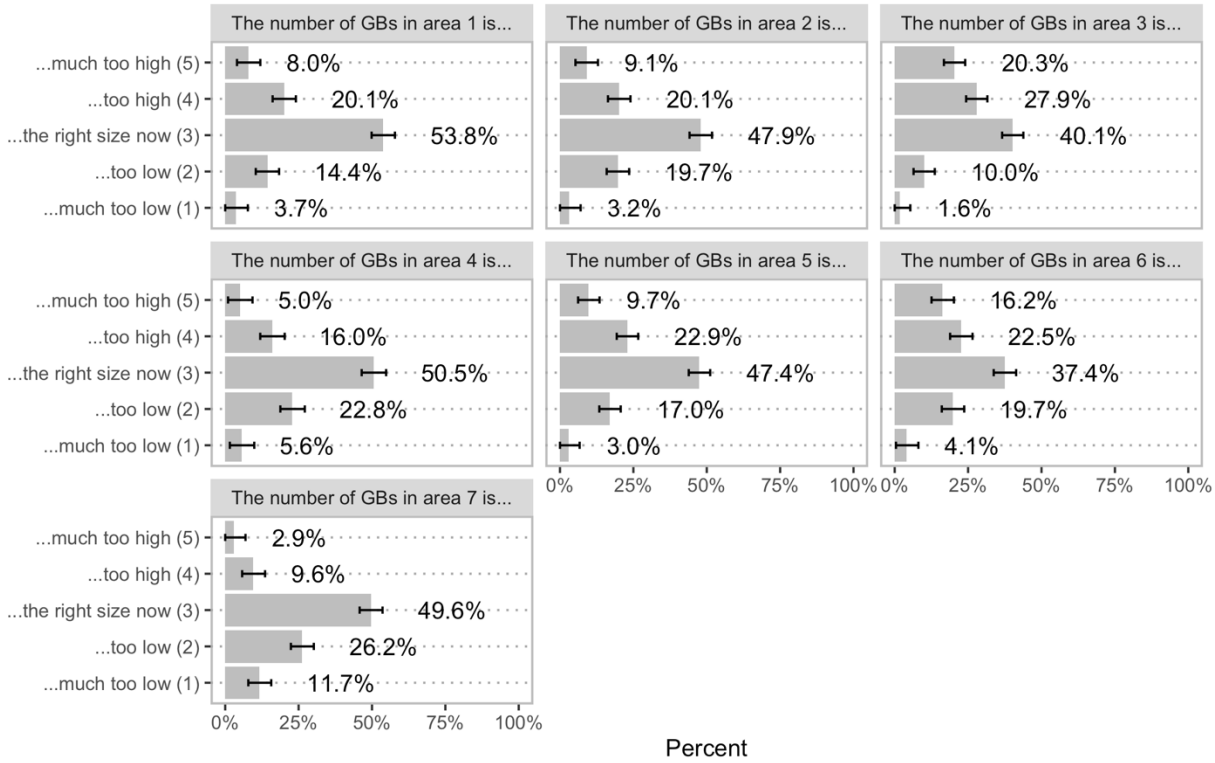

Figure 22: What respondents think of the GB population sizes in each area corresponding to the map above.

Table 7: Mean, standard deviation, and sample size regarding what respondents think of the GB popn sizes in each area corresponding to the map above.

Question	Mean	Standard Deviation	Sample Size
The number of GBs in area 1 is...	3.14	0.89	663
The number of GBs in area 2 is...	3.12	0.94	760
The number of GBs in area 3 is...	3.55	0.98	906
The number of GBs in area 4 is...	2.92	0.90	621
The number of GBs in area 5 is...	3.20	0.93	826
The number of GBs in area 6 is...	3.27	1.08	799
The number of GBs in area 7 is...	2.66	0.91	725

Question 27

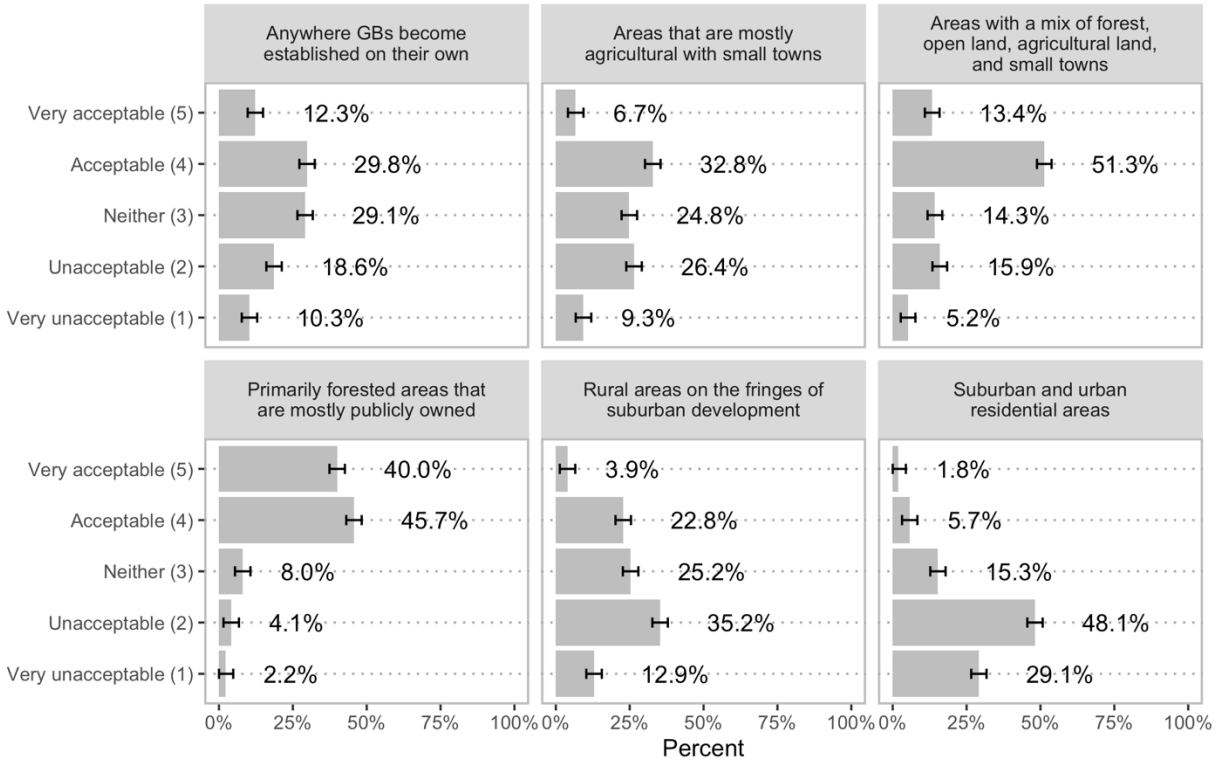

Figure 23:The level of acceptability or unacceptability for each type of region where GBs might live.

Table 8: Mean, standard deviation, and sample size regarding the level of acceptability or unacceptability for each type of region where GBs might live.

Question	Mean	Standard Deviation	Sample Size
Primarily forested areas that are mostly publicly owned	4.17	0.90	1595
Areas with a mix of forest, open land, agricultural land, and small towns	3.52	1.07	1588
Areas that are mostly agricultural with small towns	3.01	1.11	1568
Rural areas on the fringes of suburban development	2.70	1.08	1565
Suburban and urban residential areas	2.03	0.91	1583
Anywhere GBs become established on their own	3.15	1.17	1516

Question 36

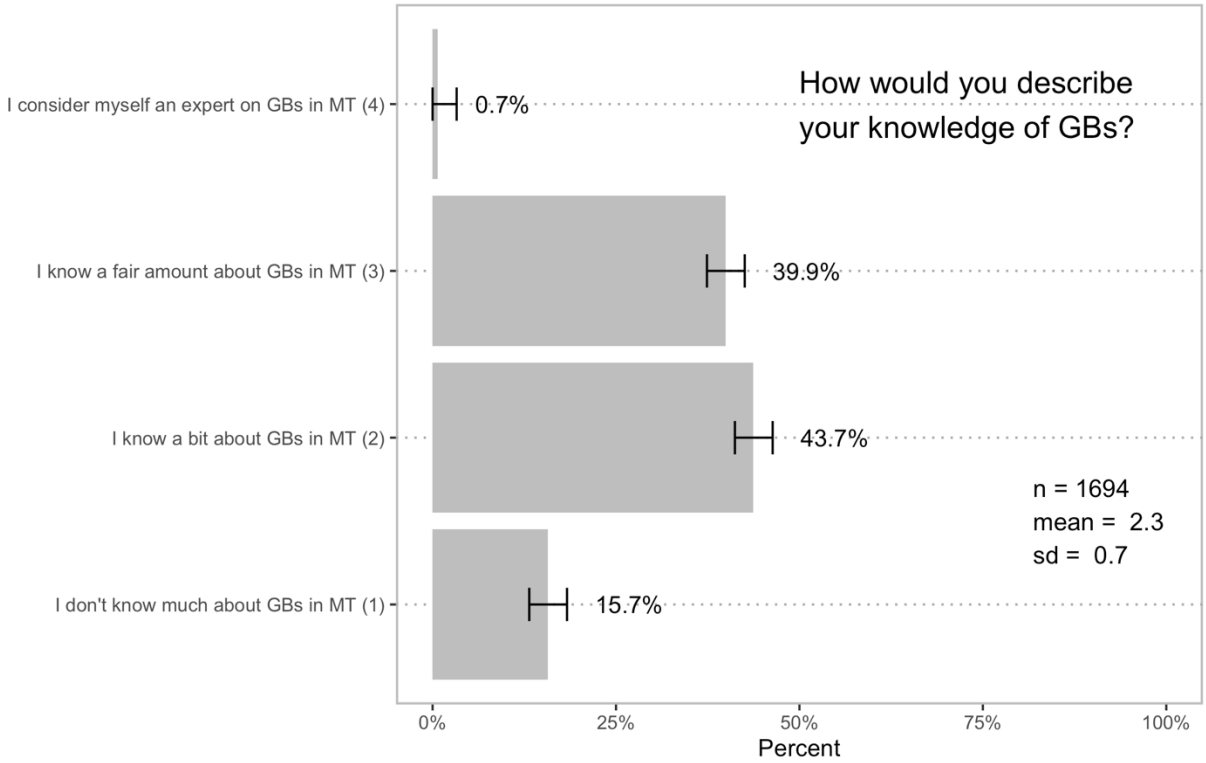

Figure 24: Level of knowledge held by respondents about GBs.

Question 37

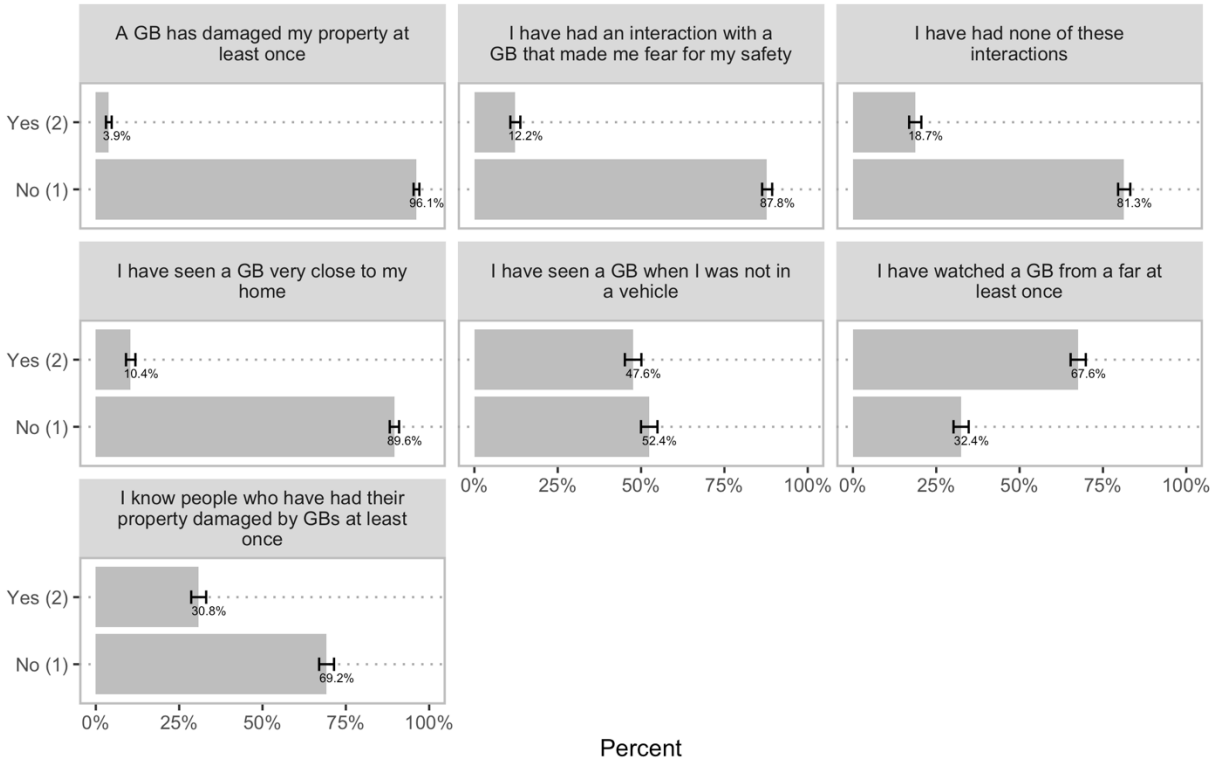

Figure 25: Percentage of respondents who have experienced each interaction with GBs.

Table 9: Mean, standard deviation, and sample size regarding respondents who have experienced each interaction with GBs.

Question	Mean	Standard Deviation	Sample Size
I have watched a GB from a far at least once	1.68	0.47	1706
I have seen a GB when I was not in a vehicle	1.48	0.50	1706
I have seen a GB very close to my home	1.10	0.31	1706
A GB has damaged my property at least once	1.04	0.19	1706
I know people who have had their property damaged by GBs at least once	1.31	0.46	1706
I have had an interaction with a GB that made me fear for my safety	1.12	0.33	1706
I have had none of these interactions	1.19	0.39	1706

Demographics

Question 28

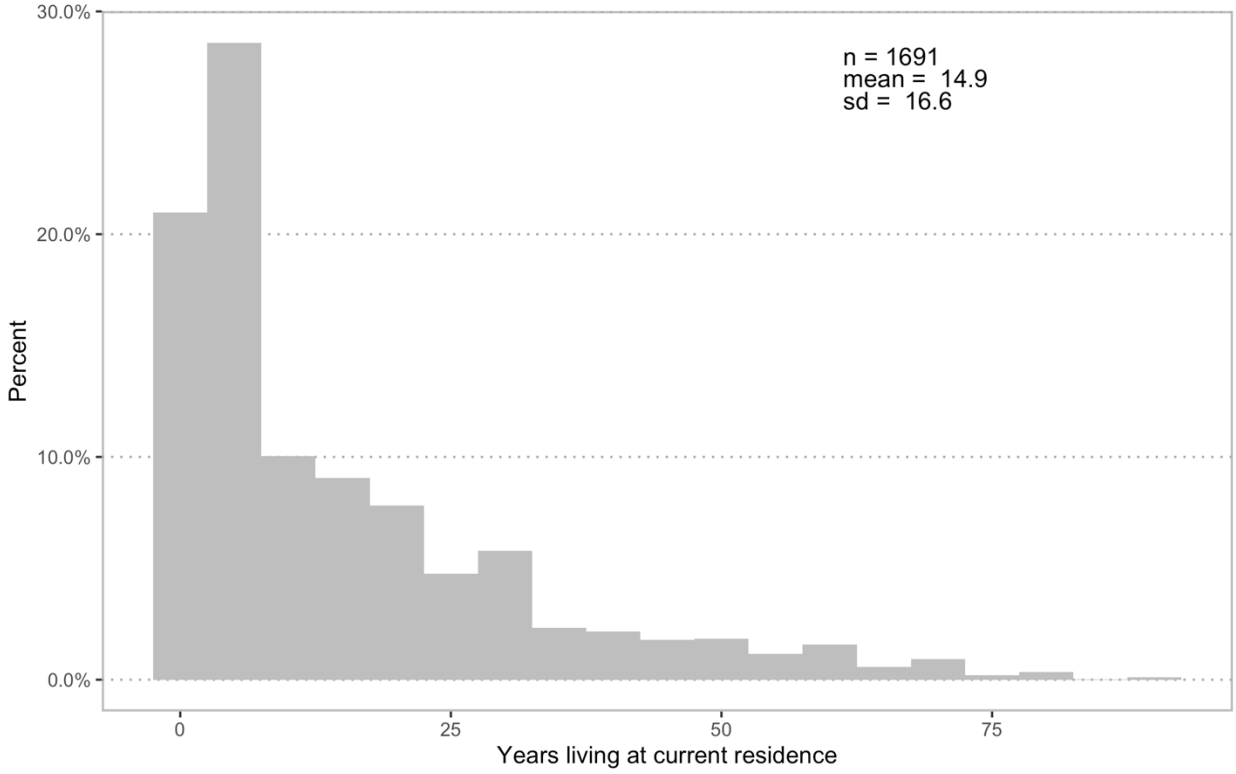

Figure 26: Age distribution of respondents, after weighting.

Question 29

Table 10: Mean, standard deviation, sample size, and frequency of full-time and part-time residents responding to survey, after weighting.

Question	Mean	Standard Deviation	Sample Size	Frequency
What type of MT resident are you? (Full-time resident = 2 Part-time resident = 1)	1.98	0.13	1699	Full-time resident = 98.3% Part-time resident = 1.7%

Question 30

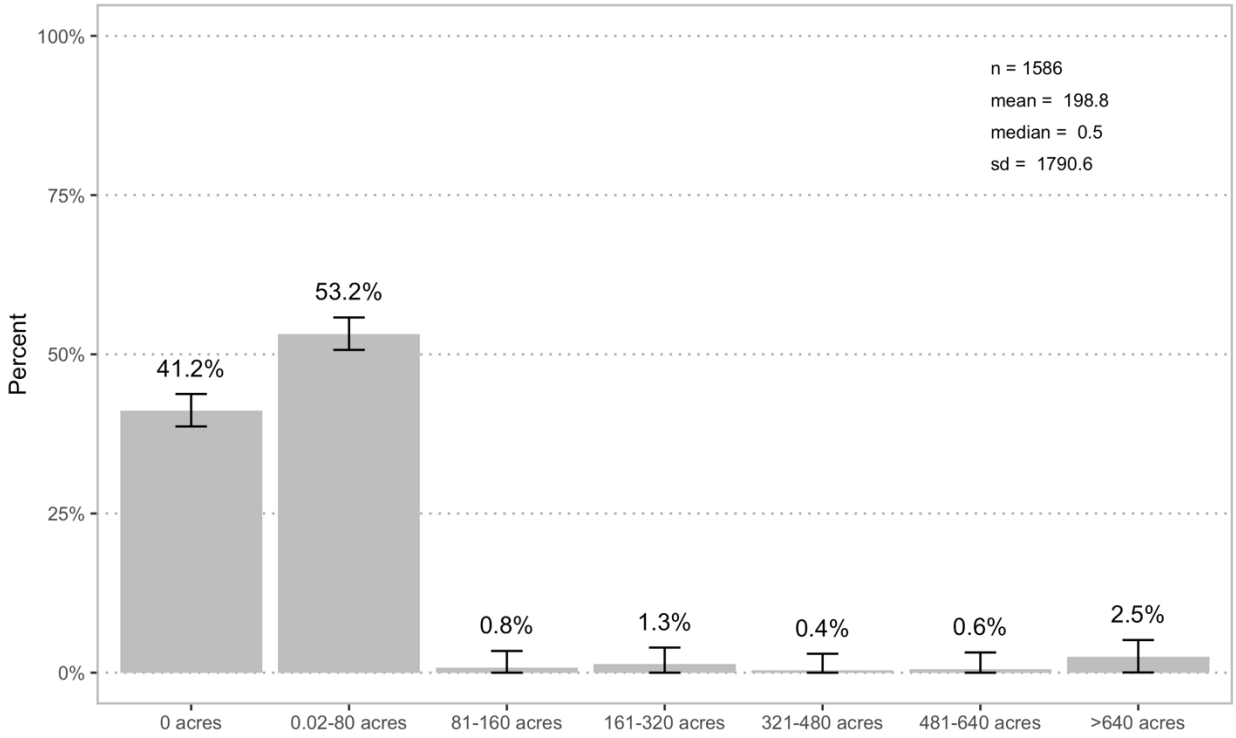

Figure 27: Acreage owned by respondents, after weighting.

Question 31

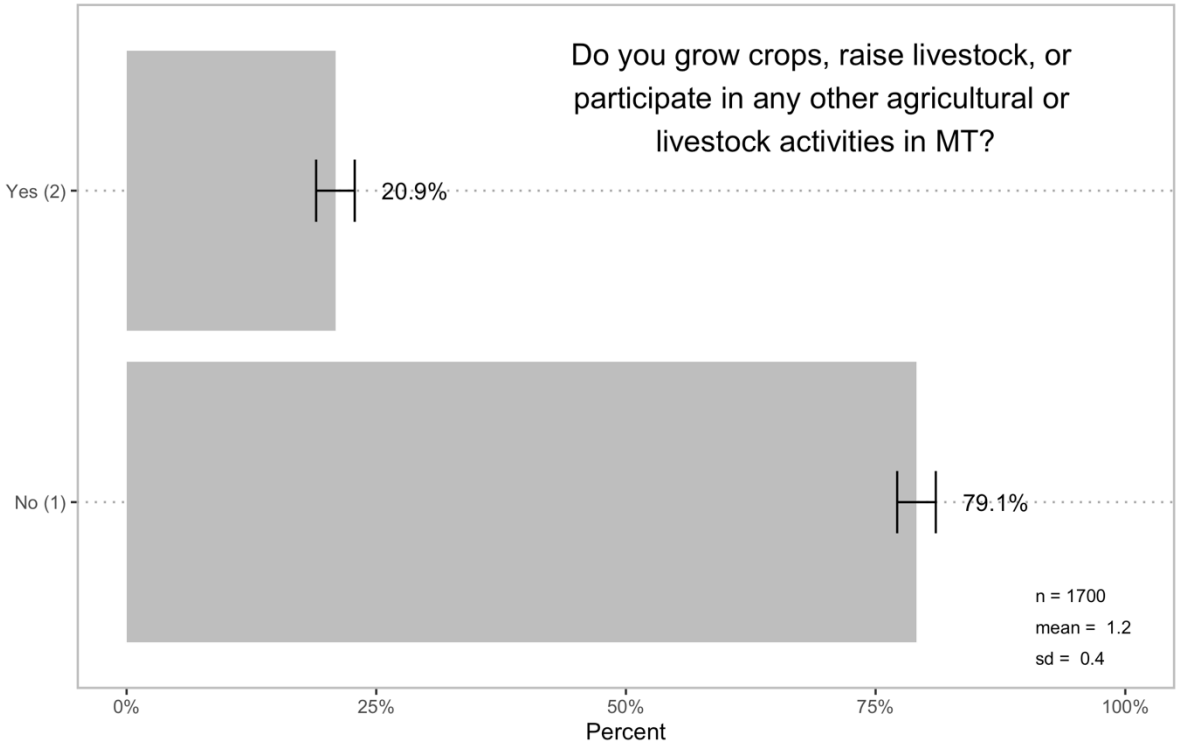

Figure 28: Percentage of respondents who are involved in agricultural or livestock activities, after weighting.

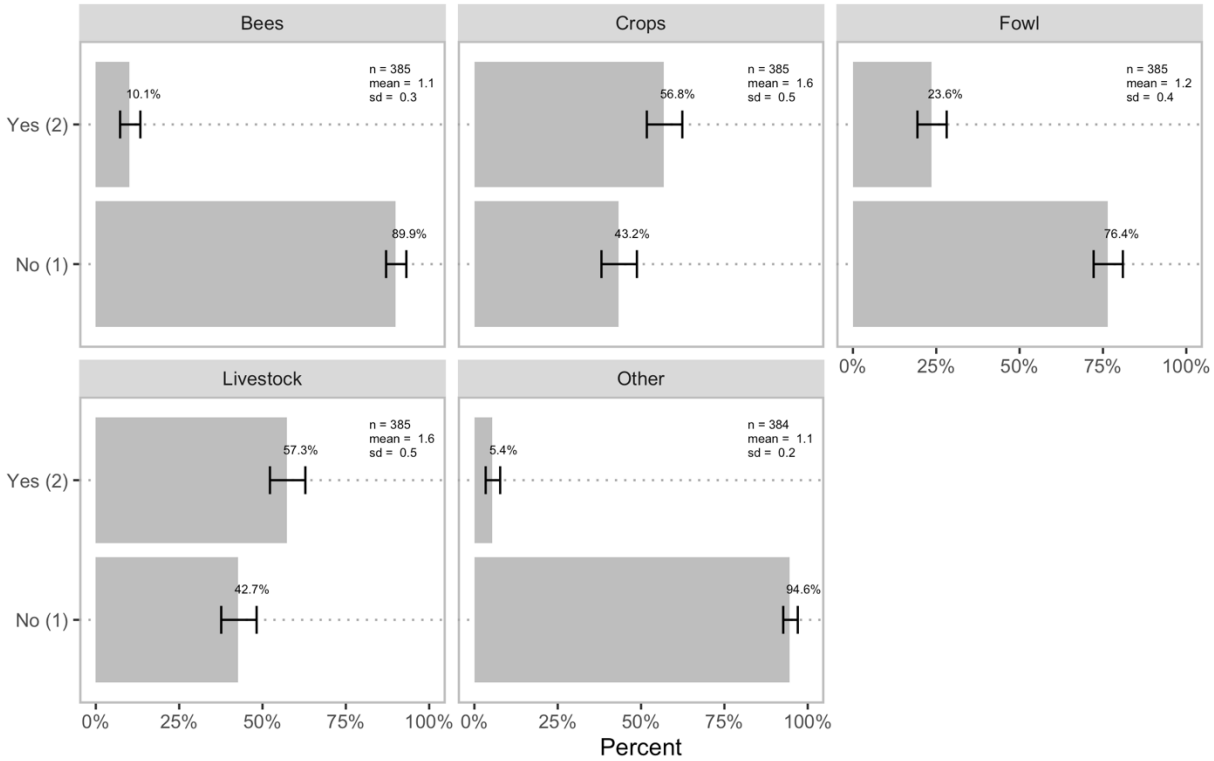

Figure 29: Of those involved in agricultural or livestock activities, the percentage of respondents who are involved in each kind of activity, after weighting.

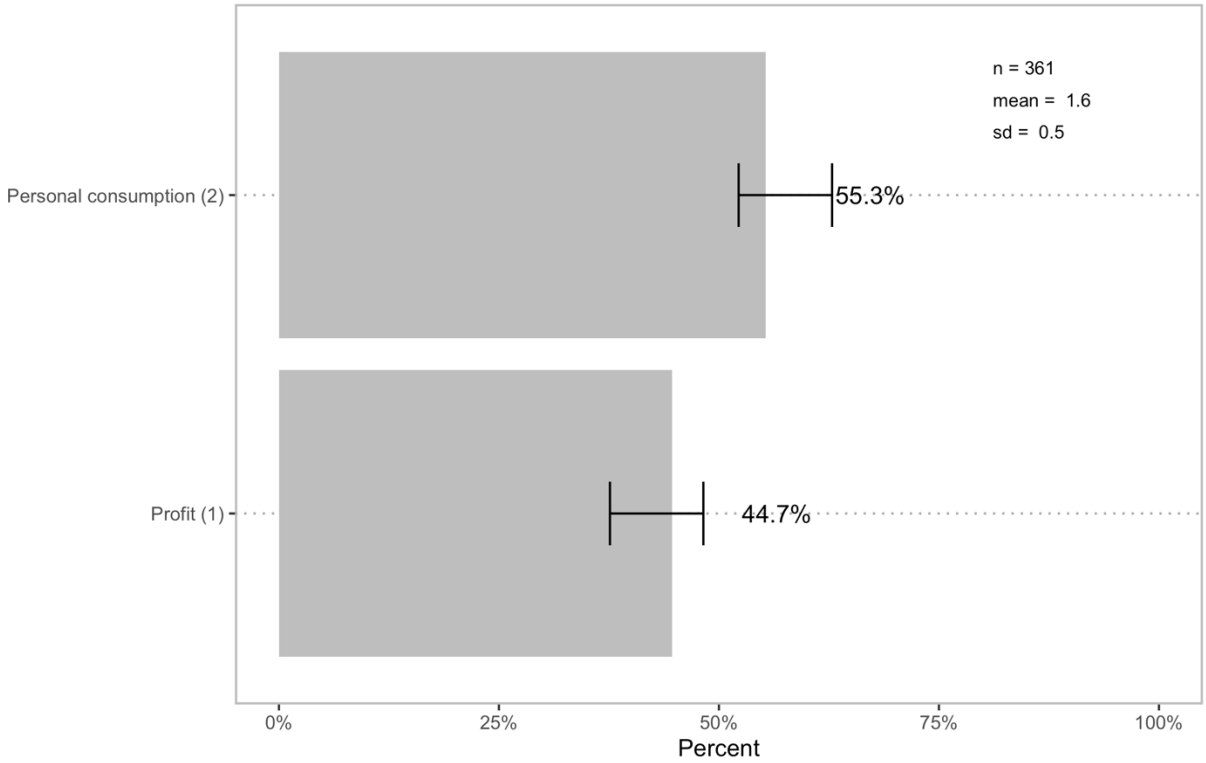

Figure 30: Of those involved in agricultural or livestock activities, the percentage of respondents who are involved mostly for personal consumption or profit, after weighting.

Question 32

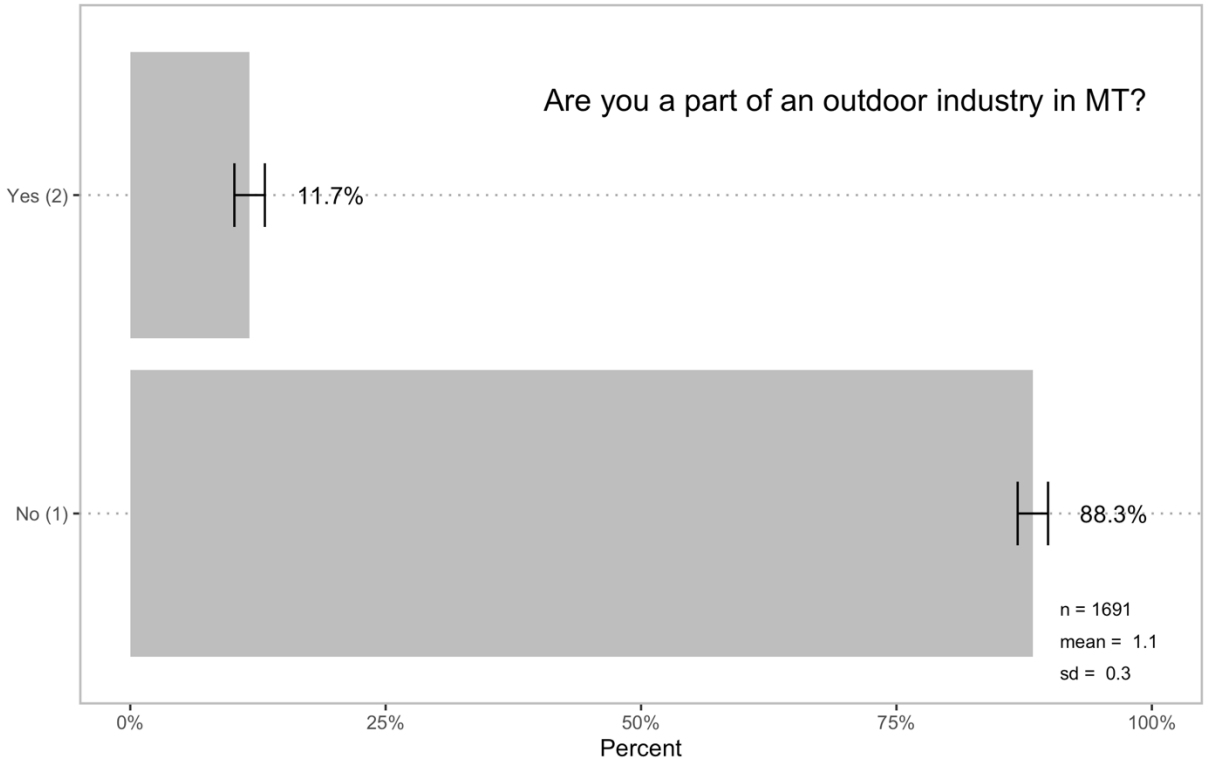

Figure 31: The percentage of respondents who are involved in the outdoor industry in MT.

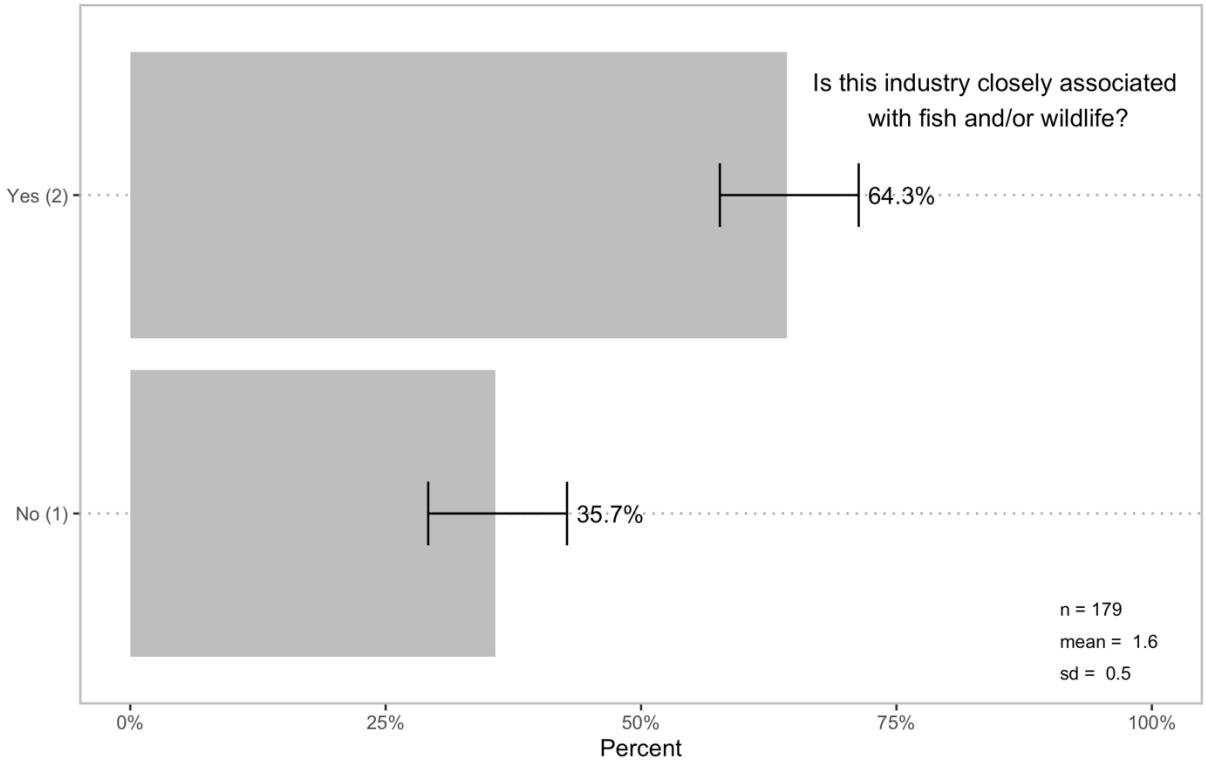

Figure 32: Of those involved in the outdoor industry in MT, the percentage of respondents whose industries are closely associated with fish and/or wildlife.

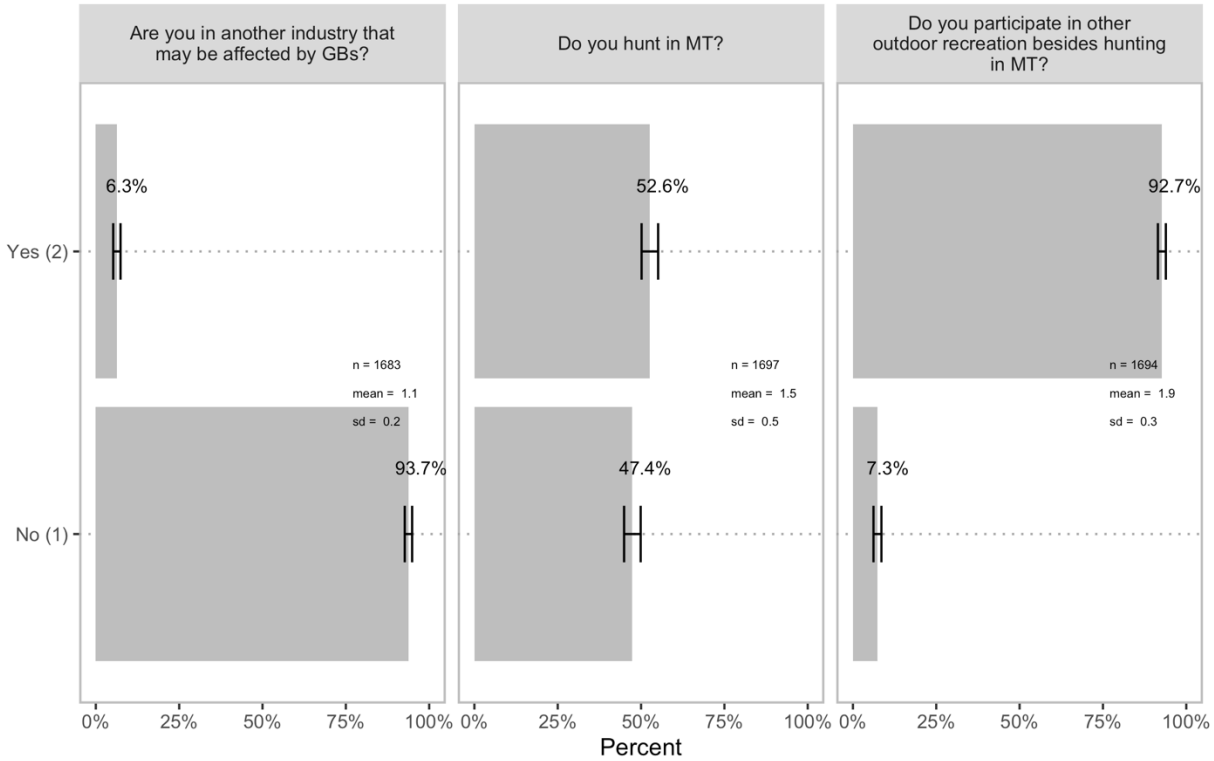

Figure 33: The percentage of respondents who are in an industry other than agriculture, ranching, and outdoors who may be affected by GBs (left panel), hunt in MT (middle panel), and participate in other outdoor recreation besides hunting in MT (right panel).

Question 38

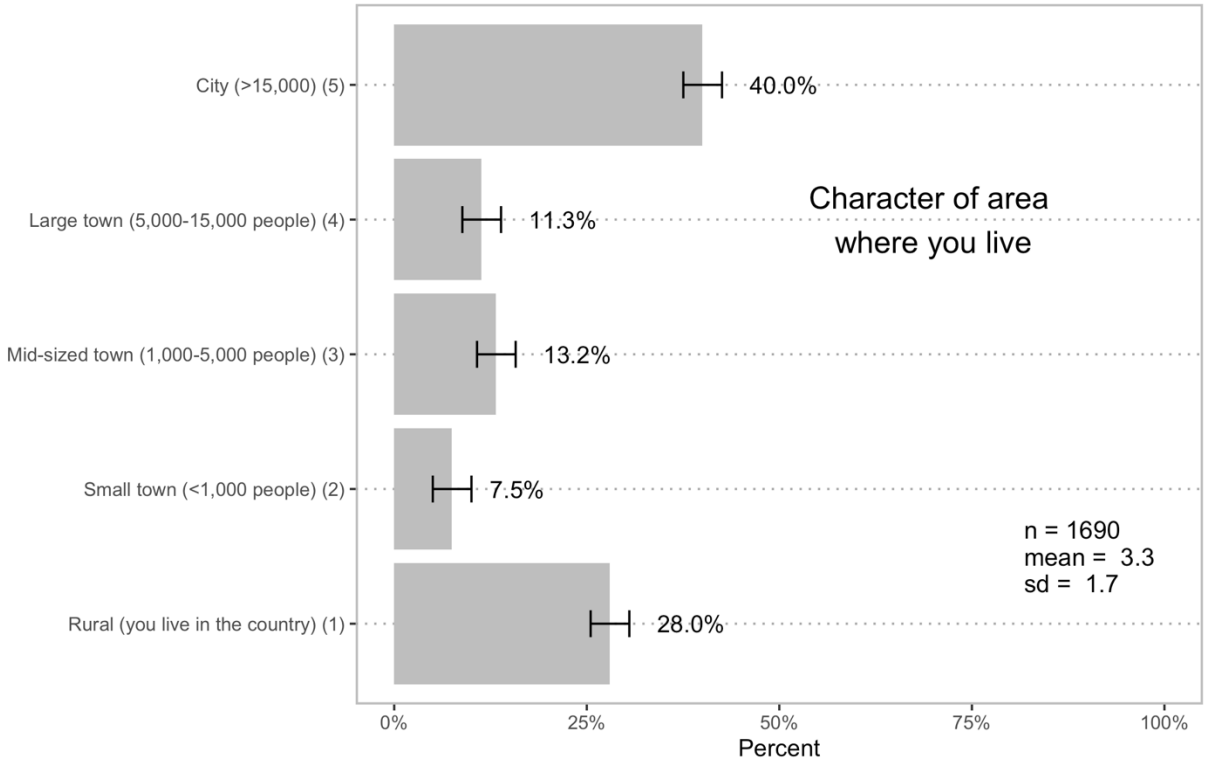

Figure 34: Percentage of respondents who live in rural areas, small/medium/large towns, and cities, after weighting.

Question 39

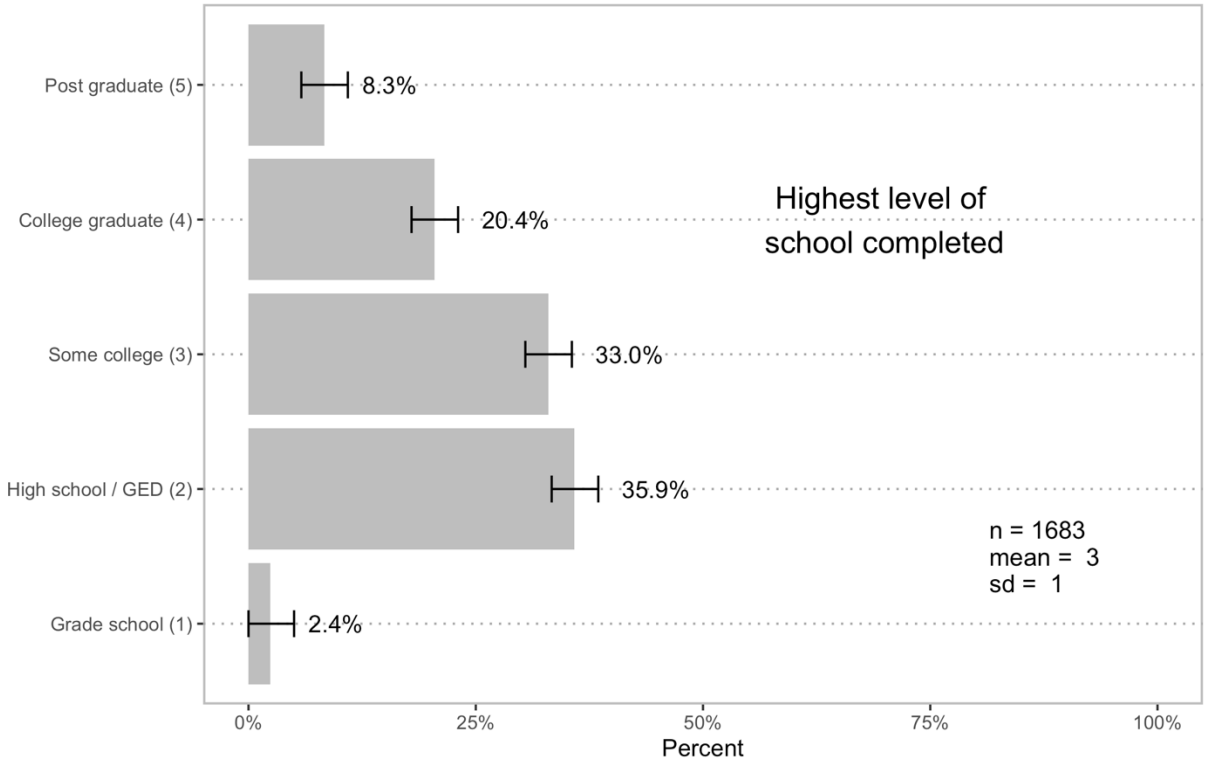

Figure 35: Education level of respondents, after weighting.

Question 40

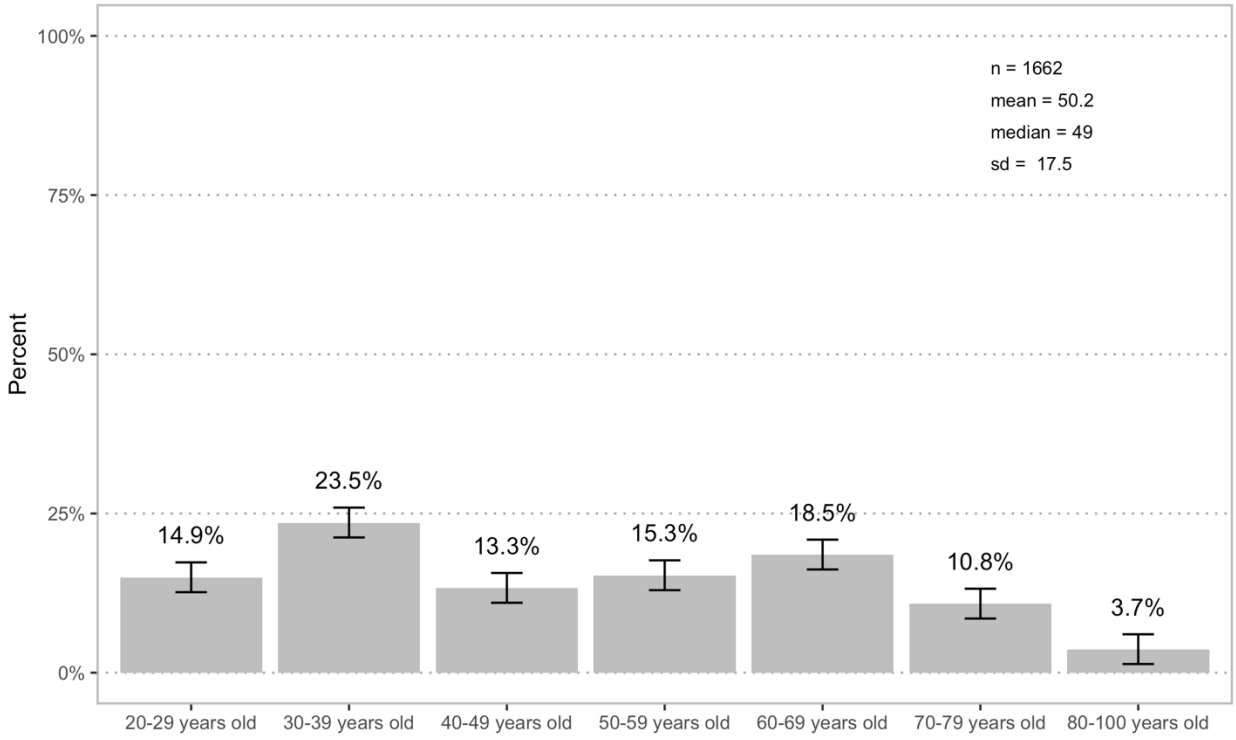

Figure 36: Age of respondents, after weighting.

Question 41

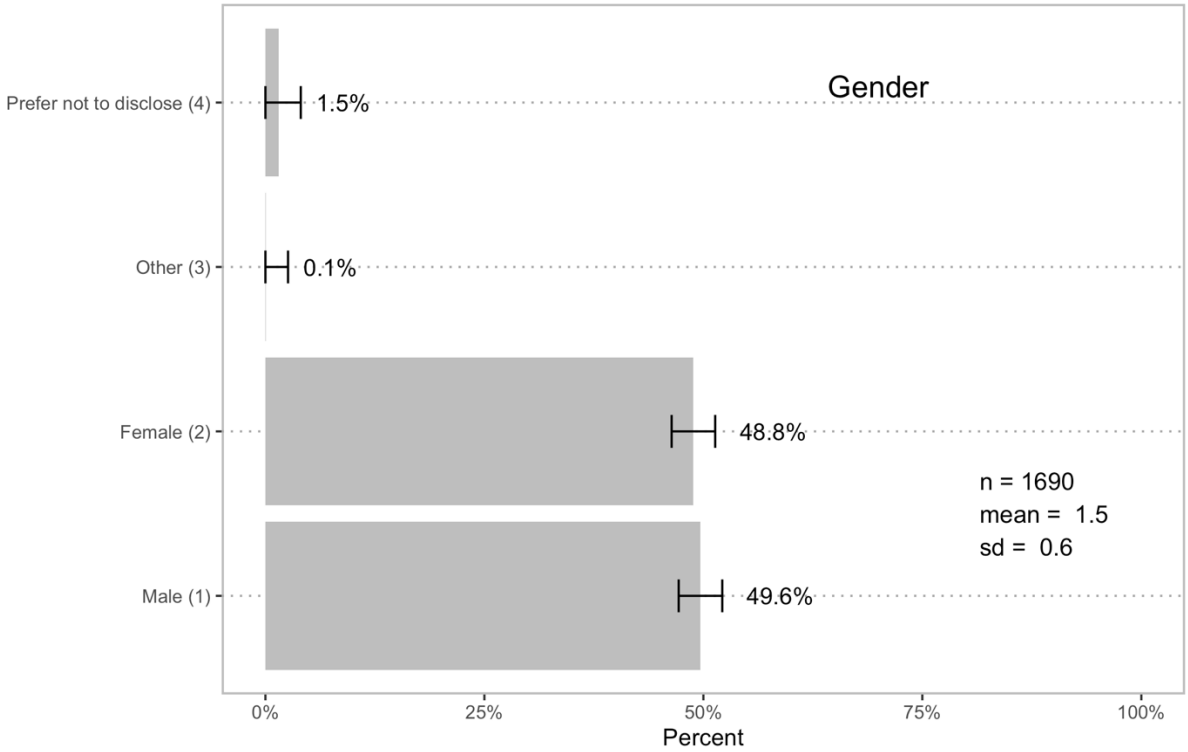

Figure 37: Gender of respondents, after weighting.