Small Game Hunter
Lead Shot Communication Study

Executive Summary

A cooperative study conducted by:

Minnesota Cooperative Fish and Wildlife Research Unit
Minnesota Department of Natural Resources

Small Game Hunter
Lead Shot Communication Study

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Executive Summary

The purpose of this study was to help identify appropriate message points for information and education programs addressing restriction of lead shot. The specific objective was to develop and test the effectiveness of targeted messages in changing attitudes, beliefs, and behaviors concerning restrictions on the use of toxic shot.

A random sample of 4,800 resident small game hunters was drawn from the Minnesota Department of Natural Resources (DNR) electronic licensing system. The sample was divided into a sample of 1,200 for a control group and 400 for each of nine treatment groups. Individuals in the sample received an 8-page self-administered survey with the control or treatment communication on the cover page. The questionnaire addressed the following topics:

- message quality,
- narrative versus factual nature of the message,
- message involvement,
- evaluation of the message,
- likelihood of supporting a ban on lead shot in the Minnesota farmland zone,
- agreement with message recommendations, outcome involvement, and behavioral intentions,
- importance of values associated with conformity and freedom, and
- background hunting small game.

A total of 2,127 surveys were returned before the cut-off date for response, resulting in an overall response rate of 45.4%. An additional 184 surveys were returned after the cut-off date for a total response rate of 49.4%.

Respondent Characteristics

The average age of respondents was 46 years. On average, respondents had been hunting for small game for 33.5 years. Nearly all of the respondents (97.1%) had hunted for small game in Minnesota during the past 5 years. About three-fourths (75.4%) of respondents had hunted for small game in the farmland zone in the past 5 years. About 60% of respondents used non-lead shot at least some of the time, compared to about 40% of respondents who always used lead shot to hunt small game. There were no statistically significant differences among the control and treatment groups in age, number of years hunting small game, participation in small game hunting in recent years, or use of lead shot.

Messages

Based on a review of the literature on persuasive messaging, we developed one control and nine treatment messages. Messages included a: (a) control message, (b) basic factual message, (c) basic factual message with declarative statement from the Minnesota Department of Natural Resources, (d) basic factual message with concession question, (e) basic factual message with a qualifier statement, (f) basic factual message with value-expressive component, (g) basic factual message with social-adjustive component with aligned norms, (h) basic factual message with social-adjustive component with non-aligned norms, (i) basic factual message adapted to third-person narrative, and (j) basic factual message adapted to first-person narrative. The control message was as follows:

> Nationwide there is concern about the effects of using lead shot while hunting small game. Although lead is the primary component of shot and has been used for a couple of centuries, there are environmental concerns associated with its continued use. The use of lead shot for waterfowl hunting has been banned nationwide since 1991.
>
> The Minnesota Department of Natural Resources is examining the issue of further restricting the use of lead shot in the state. Some other states are also examining this issue and some have already taken action. One recommendation of an advisory committee to the DNR is to phase out the use of lead shot for all small game species in the farmland zone on all public and private lands.
>
> (The farmland zone includes a large area in southern and western Minnesota that was historically prairie and has now been largely converted to row crops and pasture. The farmland zone generally does not include the forested areas in central and northern Minnesota.)

The basic factual message was as follows:

> Twenty six states have begun regulating the use of lead shot beyond existing restrictions for waterfowl hunting.
>
> Lead is a toxin that can kill humans and wildlife when it is eaten. Recent news reports have described concerns related to lead in children's toys and discussed how doves, loons, and trumpeter swans have died from lead poisoning.
>
> A regulation banning lead shot will protect wildlife and support a healthy environment. Banning lead shot will improve the image of hunters, safeguard hunting opportunities, and preserve our hunting heritage.
>
> **Support a ban on toxic lead shot in Minnesota's farmland zone.**
>
> (The farmland zone includes a large area in southern and western Minnesota that was historically prairie and has now been largely converted to row crops and pasture. The farmland zone generally does not include the forested areas in central and northern Minnesota.)

The message with the DNR declarative statement substituted the statement "The Minnesota Department of Natural Resources would like your support of a ban on toxic lead shot in Minnesota's farmland zone" for "Support a ban on toxic lead shot in Minnesota's farmland zone." The message with the concession question included the question Why would you oppose regulations banning the use of toxic shot?" instead of a declarative statement. The message with a qualifier added the phrase "although it means additional government regulation," at the beginning of the second paragraph. The value expressive message added two sentences to the beginning of the second paragraph. They were: "You love nature and the outdoors and value your hunting heritage. You want future generations to enjoy hunting and outdoor experiences like you do now." The social-adjustive, norms aligned message added the sentence "You know that a growing number of hunters have voluntarily switched from lead to non-toxic shot and that sportsmen's groups like Ducks Unlimited support the use of non-toxic shot." The social-adjustive, with non-aligned norms message added the sentence: "You know that many hunters are still using lead shot even though sportsmen's groups like Ducks Unlimited support the use of non-toxic shot."

In addition to these messages, we constructed two narrative-style messages. The third-person narrative message was as follows:

> Joe is listening to the radio on his way out to hunt pheasants. He hears a story about how 26 states have begun regulating the use of lead shot beyond existing restrictions for waterfowl hunting.
>
> Joe knows that lead is a toxin that can kill humans and wildlife when it is eaten. Indeed, he has heard recent news reports about concerns related to lead in children's toys and about doves, loons, and trumpeter swans dying from lead poisoning.
>
> He supports a regulation banning lead shot because he cares about wildlife and a healthy environment, and because he knows that banning lead shot will improve the image of hunters, safeguard hunting opportunities, and preserve our hunting heritage.
>
> **Support a ban on toxic lead shot in Minnesota's farmland zone.**

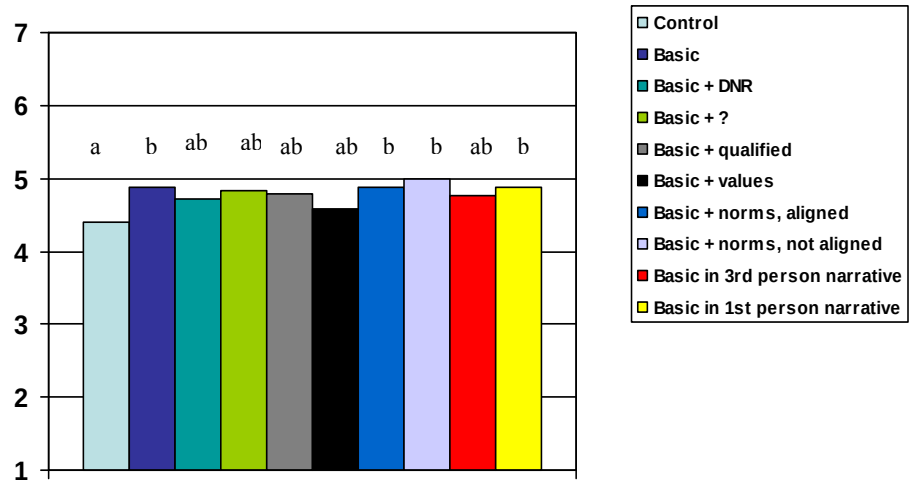
(The farmland zone includes a large area in southern and western Minnesota that was historically prairie and has now been largely converted to row crops and pasture. The farmland zone generally does not include the forested areas in central and northern Minnesota.)

The final treatment adapted the third-person narrative to first person by substituting 'you' for 'Joe' throughout the message.

Message Quality

Respondents agreed slightly that all messages, including the control message, were believable, convincing, compelling, logical, and conveyed in a straightforward way. Respondents disagreed slightly that the reasoning in the messages was unsound. Compared to all of the treatment messages, the control message was rated significantly less believable, convincing, compelling, logical and using more reasoning that was more unsound. Using a scale of message quality, which included whether the message was believable, convincing, compelling, and logical, we found that the control message had significantly lower message quality, while the basic factual, aligned social-adjustive message, non-aligned social-adjustive message, and first-person narrative message had higher message quality (Figure S-1).

Figure S-1: Message quality by treatment.

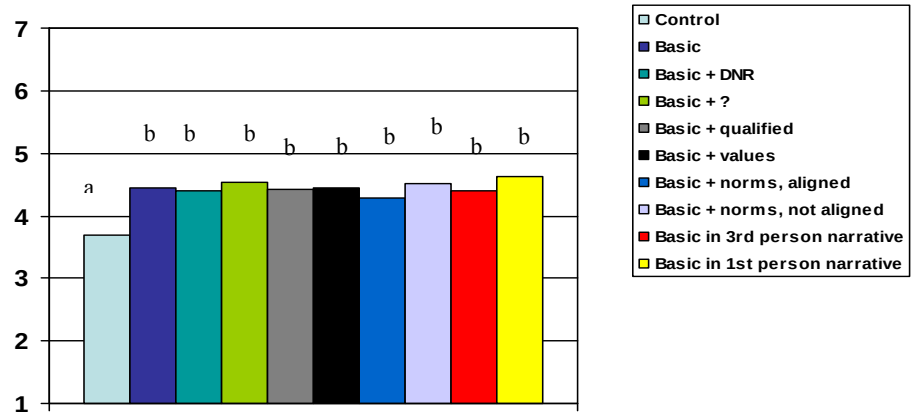


Notes: 1=extremely low evaluation, 7=extremely high evaluation
F=3.906, $p<0.001$
Letters a, ab, b indicate significant differences in Games-Howell post-hoc test.

Message Type

Respondents agreed slightly that all treatment messages were (a) persuasive, (b) conversational, (c) fact-oriented, (d) dramatic, and (e) telling a story. The control message was rated significantly less persuasive, conversational, fact-oriented, dramatic, and 'telling a story.' Based on research conducted by Polyorat (2007), we constructed a scale to test the narrative manipulation of the messages, which included whether the message was dramatic, and 'telling a story' ($r = 0.490$). The control message was perceived as having significantly lower narrative quality compared to all treatment messages (Figure S-2), but we found no difference between factual and narrative treatment messages in perception of narrative quality.

Figure S-2: Perceived narrative quality of message by treatment

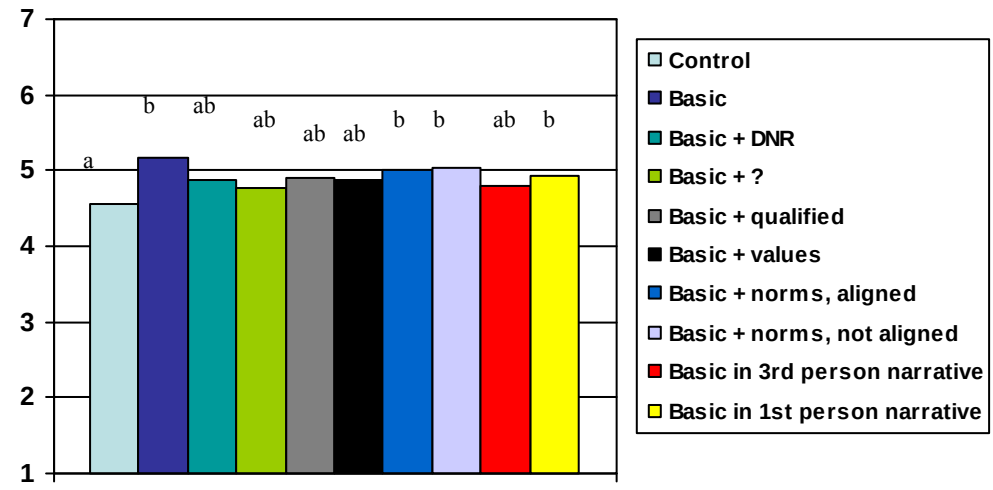


Notes: 1=non-narrative, 7=extremely narrative
F=16.277, p<0.001
Letters a, ab, b indicate significant differences in SNK post-hoc test.

Message Involvement

Five questions were asked to evaluate respondents' involvement with the messages. Respondents agreed slightly that all messages were (a) conveyed clearly, (b) easy to understand, (c) interesting, (d) involving, and (e) credible. The control message was perceived as having significantly lower message involvement compared to all treatment messages. The basic factual message, two social-adjustive treatment messages, and the first-person narrative message were rated to have greater message involvement (Figure S-3).

Figure S-3: Message involvement by treatment



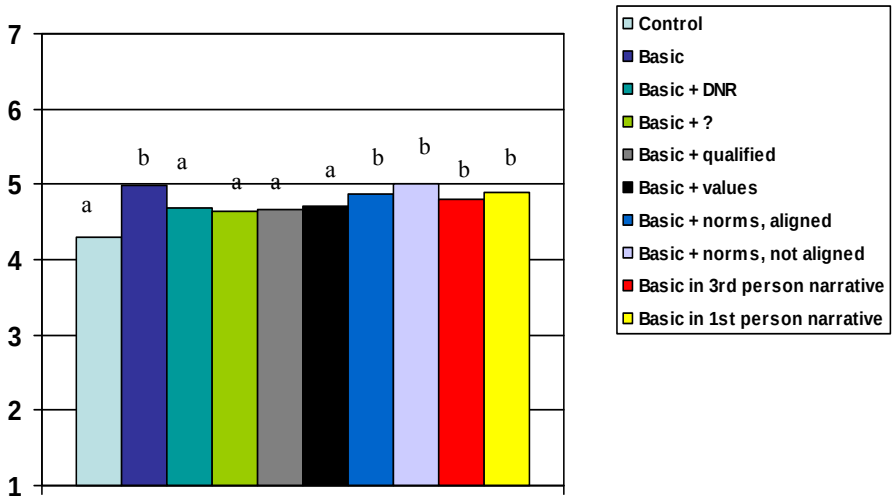
Notes: 1=non-narrative, 7=extremely narrative
F=5.055, p<0.001
Letters a, ab, b indicate significant differences in Games-Howell post-hoc test.

Message Evaluation

Six questions were asked to measure respondents' evaluation of a ban on lead shot in the farmland zone of Minnesota. On average, respondents agreed just slightly that a ban was: (a) beneficial, (b) good, (c)

wise, (d) worthwhile, (e) appealing, and (f) important. Respondents who received the control message felt that a ban would be less beneficial, good, wise, worthwhile, appealing and important. Using a scale of six evaluation items, we found that respondents who received the control message had a lower evaluation of a ban compared to respondents who received the treatment messages. Respondents who received the basic factual message, the two normative treatment messages, and the two narrative messages rated a ban more positively (Figure S-4).

Figure S-4: Message evaluation by treatment.

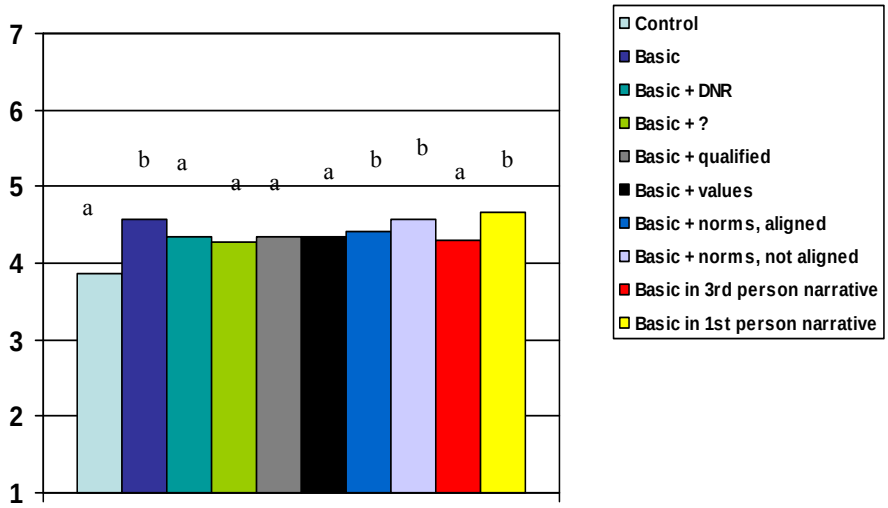


Notes: 1=extremely low evaluation, 7=extremely high evaluation
F=4.412, p<0.001
Letters a, ab, b indicate significant differences in Games-Howell post-hoc test.

Agreement With Message Recommendations, Outcome Involvement, Behavioral Intentions

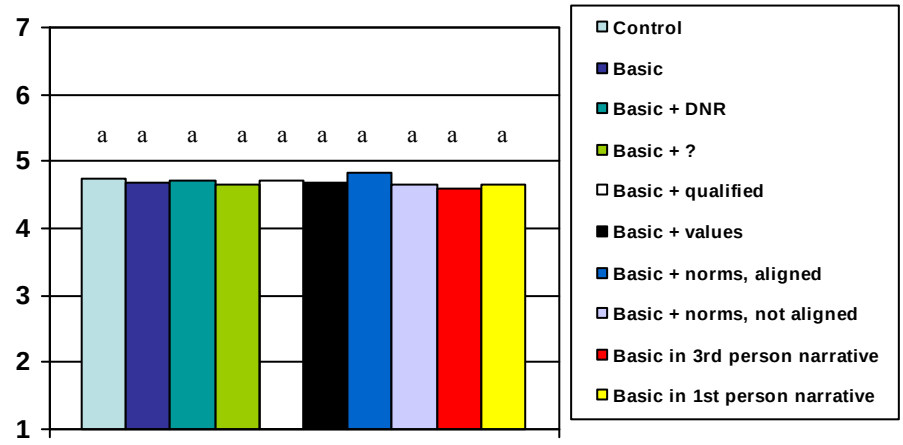
We constructed three scales to measure overall agreement with message recommendations, outcome involvement, and behavioral intentions. We found that respondents who received the control message agreed less with the message recommendations, while respondents who received the basic factual and first-person narrative messages agreed more (Figure S-5). We found no significant differences among the control and treatment groups in outcome involvement (Figure S-6). Respondents who received the basic factual, non-aligned social-adjustive, and first-person narrative messages reported stronger intentions to support a ban on lead shot in the farmland zone, while those who received the control message reported weaker intentions, compared to other treatment groups (Figure S-7).

Figure S-5: Agreement with message recommendations by treatment.



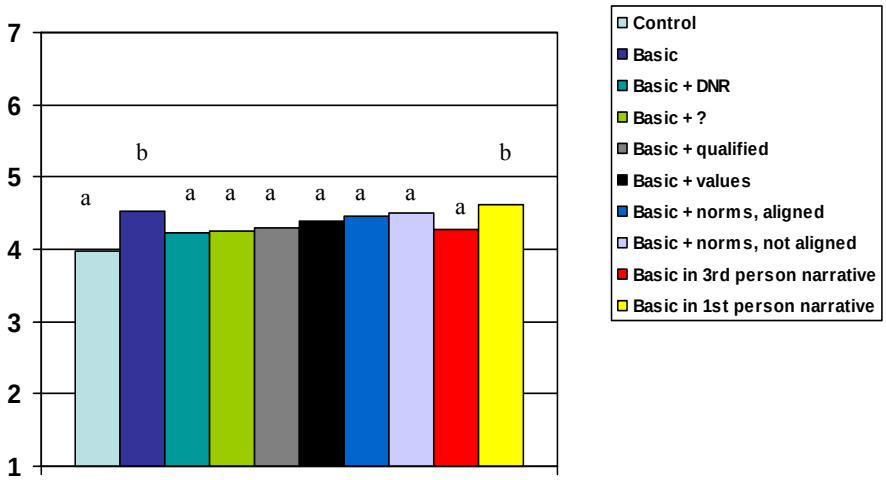
Notes: 1=extremely low evaluation, 7=extremely high evaluation
F=4.112, p<0.001, η=0.132
Letters a, ab, b indicate significant differences in Games-Howell post-hoc test.

Figure S-6: Outcome involvement by treatment.



Notes: 1=extremely low evaluation, 7=extremely high evaluation
F=0.574, n.s., η=0.050
Letters a, ab, b indicate significant differences in Games-Howell post-hoc test.

Figure S-7: Behavioral intentions by treatment.

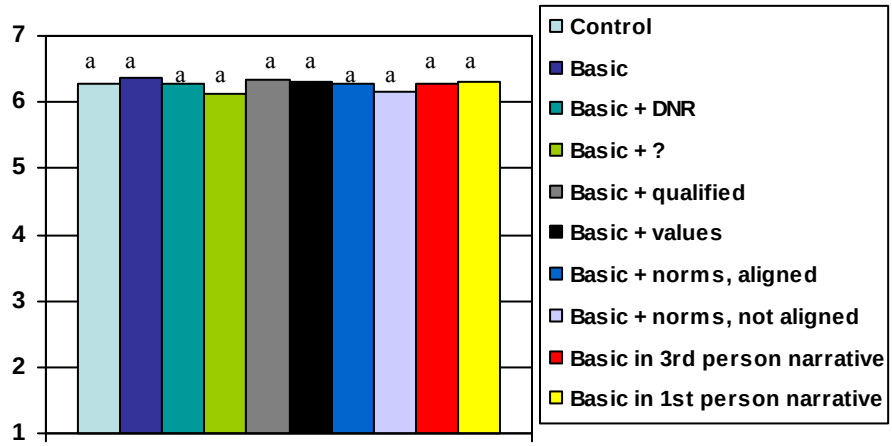


Notes: 1=extremely low evaluation, 7=extremely high evaluation
F=2.691, p<0.01, η=0.107
Letters a, ab, b indicate significant differences in Games-Howell post-hoc test.

Values

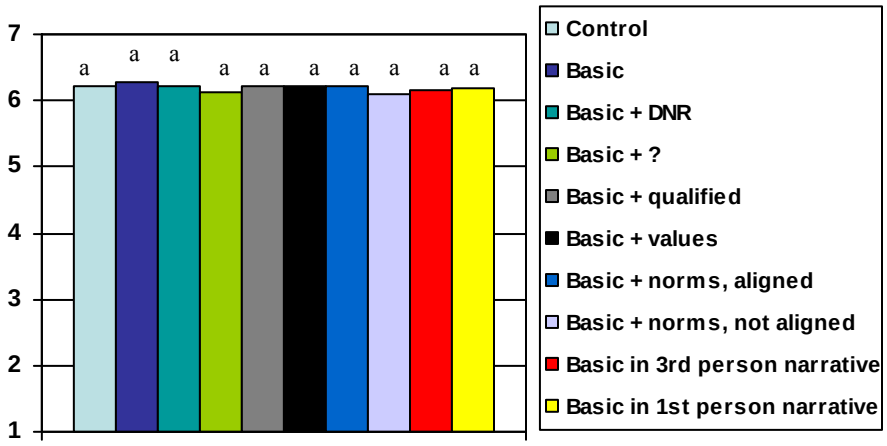
Survey recipients were asked to respond to nine items derived from Hullett and Boster (2001) addressing values related to conformity and self direction. We found no significant differences among the control and treatment groups in the importance of conformity (Figure S-8) or self-direction (Figure S-9) values. Unlike Hullett and Boster (2001), we did not find significant relationships between self-direction values and message quality for the values-expressive message, nor conformity values and message quality for the social adjustive message with norms aligned. We found significant positive relationships between both self-direction values (r = 0.234**) and conformity values (r = 0.262**) with the message quality for the social adjustive messages with non-aligned norms.

Figure S-8: Importance of conformity value by treatment.



Notes: 1=extremely low evaluation, 7=extremely high evaluation
F=0.795, n.s., η=0.059
Letters a, ab, b indicate significant differences in Games-Howell post-hoc test.

Figure S-9: Importance of self-direction value by treatment.



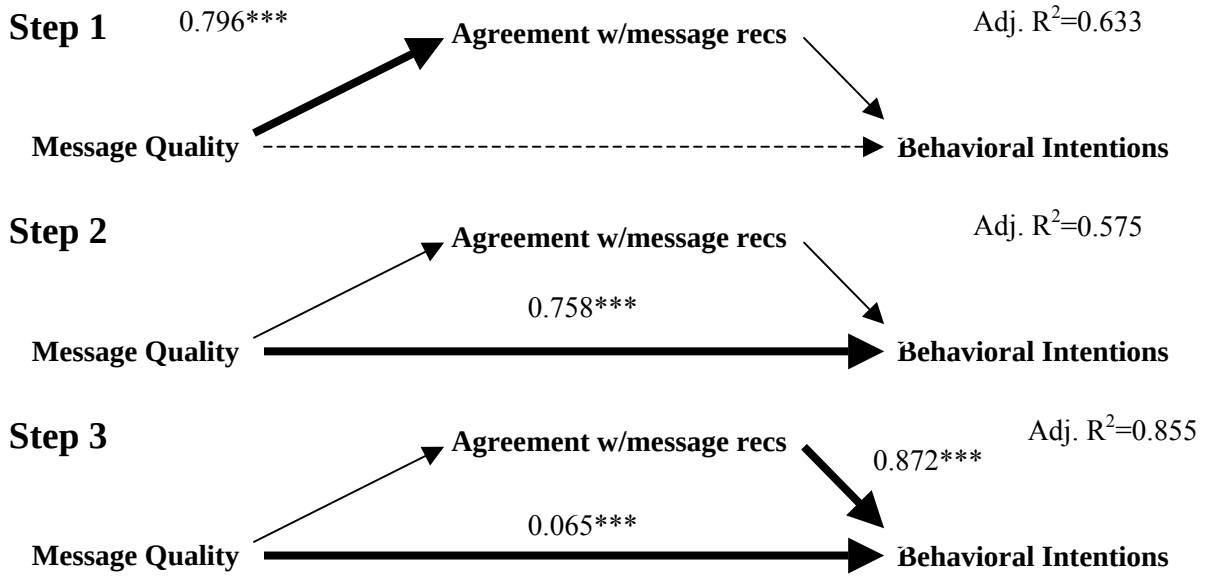
Notes: 1=extremely low evaluation, 7=extremely high evaluation
F=0.437, n.s., η=0.043
Letters a, ab, b indicate significant differences in Games-Howell post-hoc test.

Modeling the Effectiveness of Communications on Support for a ban on Lead Shot in Minnesota's Farmland Zone

Based on the research of Hullett and Bolster (2003) and Polyorat (2007), we examined the factors associated with persuasive messages that may relate to support for a ban on lead shot in the Minnesota farmland zone. We found that message quality (r = 0.758***), perception of the narrative quality of the message (r = 0.334***), message involvement (r = 0.598***), product evaluation (r = 0.875***), agreement with message recommendations (r = 0.923***), conformity values (r = 0.070**), and self-direction values (r = 0.069**) were positively correlated with our scaled measure of intention to support a ban on lead shot in the Minnesota farmland zone. Outcome involvement (r = -0.147***), years hunting small game (r = -0.126***), age (r = -0.074**), and increased use of lead shot for hunting small game (r = -0.470***) were negatively correlated with intent to support a ban. Respondents who had hunted for small game in the Minnesota farmland zone in the past 5 years were significantly less likely to support a ban ($\bar{x} = 4.143$) than those who had not hunted in the area in the past 5 years ($\bar{x} = 4.741$) (F=36.47***, η = 0.131).

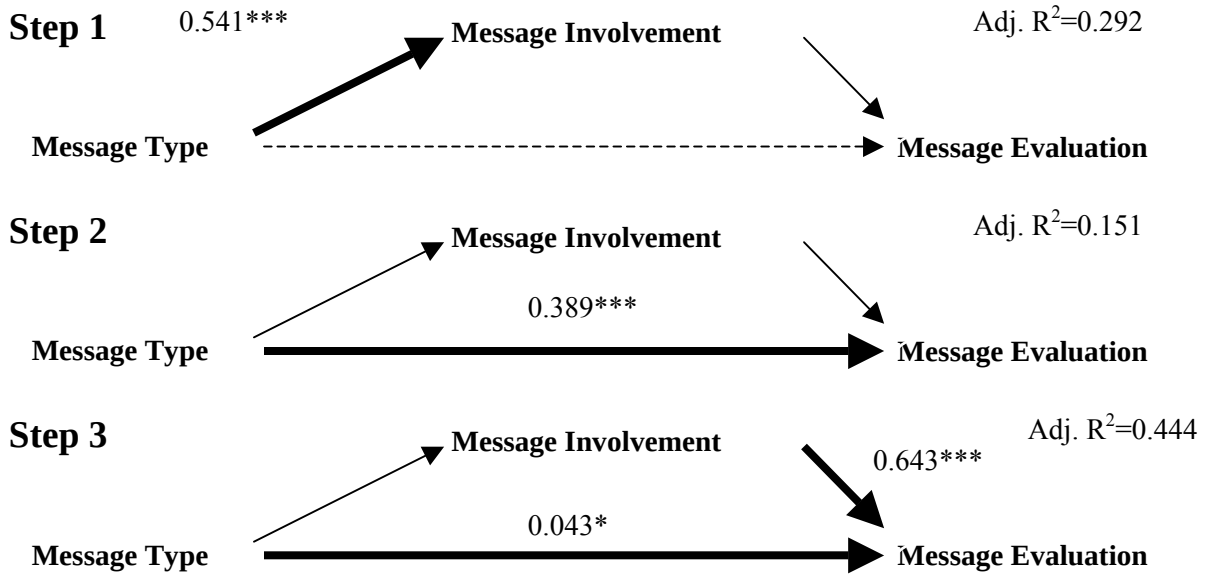
We conducted mediation analyses to examine the relationships first among (a) message quality, (b) agreement with message recommendations, and (c) intention to support a ban, then among (a) message type, (b) message involvement, and (c) message evaluation. We followed Baron and Kenny's (1986) recommendations for mediation analysis, which involved computing a series of three models. Agreement with message recommendations partially mediated the relationship between message quality and behavioral intentions (Figure S-10).

Figure S-10: Mediation Analysis of Message Quality, Agreement With Message Recommentations, and Behavioral Intentions to Support a Ban on Lead Shot in the Farmland Zone.



Message involvement partially mediated the relationship between message type (i.e. perception of narrative nature of the message) and product evaluation (Figure S-11).

Figure S-11: Mediation Analysis of Message Type, Message Involvement, and Message Evaluation.



Conclusions

Our results suggest that persuasive messages may increase support for a ban on lead shot in Minnesota's farmland zone. Compared to respondents who received the control message, respondents who received treatment messages reported more positive attitudes about, higher evaluations of, and stronger support for a possible ban on lead shot. Results suggest that basic factual, first-person narrative, and social-adjustive messages mentioning Ducks Unlimited may be more persuasive than messages that use: (a) declarative statements from the Minnesota Department of Natural Resources, (b) concession questions, (c) qualifiers (i.e. counterarguments), (d) value-expressive messages about hunting heritage, or (e) third-person narrative.