

UTILIZING THE ELABORATION LIKELIHOOD MODEL TO GENERATE  
PERSUASIVE COMMUNICATION FOR OFF-ROAD VEHICLE MANAGEMENT IN  
THE YUKON TERRITORY

By

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## Abstract

As persuasive communication is among the least intrusive of all management tools, this thesis proposes that persuasive messaging based upon the Elaboration Likelihood Model (ELM) could be used to promote low-impact ORV use in the Yukon's backcountry. Information was collected through a content analysis of three documents that focused on the use of ORVs in Yukon. Information was gathered, analyzed and used to create four persuasive messages. Messages were then presented to focus groups and tested for effectiveness and adherence to the theoretical framework used. Focus group data suggests some message content was likely processed with a bias and primarily reinforced strong initial attitudes towards unrestricted ORV use. Frequent inconsistencies between the environmental impacts acknowledged by the ORV user and impacts reported in the literature were also found. Future research should attempt to limit these inconsistencies and gather specific information on user's attitudes towards the environment and environmentally sound riding practices.

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## Introduction

The Yukon Fish and Wildlife Management Board (YFWMB) is a non-government organization that advises the Yukon Territorial Minister of Environment on matters related to fish, wildlife and habitat management. Under the Umbrella Final Agreement (Government of Canada, 1993) the organization is considered the primary instrument for fish, wildlife and habitat management in the Yukon. For many years the board has received various concerns regarding the use of off-road vehicles (ORV) in the backcountry and their environmental effects. More recently, the YFWMB had gone through extensive public consultations on the use and management of ORVs in the Yukon and found there was a high level of concern among much of the population, yet strong opposition to regulatory changes, area closures and legislative restrictions among the ORV user groups (YFWMB, 2003).

Like many wilderness activities (Hendee, Stankey & Lucas, 1990), the diversity of ORV users and the difficulties in enforcing responsible use in the backcountry have made it challenging for land management agencies and managers to address the impacts of ORVs using traditional land management methods. Regulation, legislation and bylaws are all management tools that can be utilized if they are in place; however, getting these types of legislation passed and enforced is often difficult. Yukon ORV users have stated bluntly that they are not interested in having their activity regulated, legislated or limited in any way (Loeks, 2000). This viewpoint is not unique to the Yukon, and can be seen throughout North America (e.g., Propst, Schomaker, & Mitchell, 1977). A recent study in Utah produced an extensive survey regarding the use of ORVs, finding that the primary concerns of the ORV population were said to be, “increasing access to public land” and

“having enough places to ride” (Blahna, Bahr & Fisher, 2001, p. 27). Even the thought of potential regulations in sensitive landscapes can spark enormous public and political backlash. A recent public survey regarding issues and concerns of ORVs in the Yukon sparked immense controversy among the ORV user groups (YFWMB, 2003).

Although the issue is currently both publicly and politically controversial, it is likely to increase in intensity. In 2000, Loeks estimated that there were close to 4,000 ATVs and over 12,000 snow machines in the Yukon; he predicted that the number would only increase (Loeks, 2000). In addition to an increase in ORV sales within the Yukon, the types of impact and the ecological locations that these impacts take place in only add to the urgency for a mutually agreeable solution.

This study proposes that a solution to this complex problem is the use of public communication using text, audio and/or visual messages specifically constructed to address issues related to the public interest. Messages are often delivered through the use of radio, newspaper, brochures, pamphlets, signs or other media that are known to be received by the targeted audience. The advantage of using public communication is that it has the ability to persuade target groups to adopt behaviours so that legislative or regulatory measures can be avoided or limited. Media approaches have the potential to lower the impacts related to ORV use while not legislatively limiting the freedoms of ORV users. Public communication with a focus on persuasive messaging can address many issues surrounding the impacts of ORVs without being as controversial as legislation or management restrictions. If messages are developed properly, public communication has the potential to persuade ORV populations, influence environmental concern and promote low-impact behaviours in the backcountry. In the Yukon,

persuasive communication has the potential to assist in limiting the impacts of ORVs while ensuring that the freedoms and lifestyles of Yukon wilderness users are not threatened. To do this a general theoretical framework must be identified and explored in order to guide the persuasive communication process and assist in maximizing the effectiveness and impact of the communication messages.

The processes involved with persuasion have been studied extensively in the area of social psychology. Through this research a number of theories have been proposed, tested and applied. Of particular interest in this study is the Elaboration Likelihood Model (ELM) created by Petty and Cacioppo (1986), who present the model as a theory that “provides a general framework for organizing, categorizing and understanding the basic processes underlying the effectiveness of persuasive communication” (p. 195). The ELM promotes the idea that the influence of attitudes towards particular issues often guides the decisions and behaviours of individuals. It is this premise that this study is based upon.

The ELM presents two basic routes of persuasion by which an individual will process information and messaging: the central and peripheral route. The central route represents a cognitive path that reflects an individual’s ability to process and elaborate upon the presented information in a manner that promotes a long-term change in attitude towards a particular issue or behaviour. The peripheral route suggests that an individual processes information and forms attitudes based on a low degree of information elaboration. Within the construct of the ELM, message elaboration exists on a continuum, and is determined by the extent to which a person thinks about issue relevant arguments within a message (Petty & Cacioppo, 1986). When applying this model to the issues surrounding ORV use, the goal of this study will be to encourage elaboration of the

presented message content in order to increase the potential for the audience to adopt central route processing. Central route processing is advantageous because receivers who process message information through this cognitive route often demonstrate greater potential to adopt a long-term change in attitude towards a particular behaviour (Petty & Cacioppo, 1986).

To achieve central route processing, the communication messages used in the study will be based upon specific information gathered from ORV users in order for them to be suitable as a persuasive argument. The abilities of the ORV population to process message content will be explored as well as the various motivations that may inhibit or encourage the process of message elaboration.

### *Research Questions*

Specifically, four underlying questions are explored.

1. What concerns and attitudes regarding ORV use exist among the sample and of these concerns, which are the most salient to users?
2. What information within the text sources can assist with the development of ELM based message content?
3. Does the message content created adhere to the tenets of the ELM?
4. What message content has the potential to motivate the audience to adopt a positive attitude towards limiting their ORV impacts?

For this study, secondary data analysis, through an extensive content analysis of three Yukon based documents that focused on the use of ORV, was used. The information was analyzed for pertinent indicators and themes related to ELM based variables. This information was then used to generate four persuasive messages. Once

established, the messages were tested for adherence to the ELM and thus their effectiveness in influencing the attitudes towards ORV use among the ORV population. In short, this process produced persuasive messages that promote low-impact ORV use by adhering to the tenets of the ELM. These messages will then be tested for ELM adherence and persuasive effectiveness.

### *Potential Researcher Bias*

Dealing with a controversial issue such as ORV use, it was important to ensure that participants were fully aware of the researcher's background and intent. In this study, it should be noted that focus group participants may have felt uneasy speaking about ORV use with an employee of the YFWMB. In previous years, the YFWMB was often portrayed as an organization that proposed restrictive regulations on ORV use. To combat this impression, a significant amount of time was spent early on in the focus group session explaining the intentions of this study. While somewhat limiting, being an employee of the YFWMB has also allowed the researcher to experience the issue of ORV use and their impacts from a variety of perspectives. The organization works closely with the trapping and outfitting industry, Renewable Resource Councils, Department of Environment and various other special interest groups such as the Klondike Snowmobile Association and the Fish and Game Association.

My personal experience with and around ORVs and their use has been somewhat mixed. As an avid outdoor enthusiast the principle researcher often travels in the same areas as many ORV users and has witnessed the impacts of reckless behaviour and the effectiveness of low-impact driving techniques. The researcher has used ORVs for

hunting, outdoor recreation and work related activities however would not be considered an avid ORV user.

## Literature Review

### *Impacts of ORV use*

While a complete review of the impacts of ORVs is beyond the scope of this study, it is important to understand the extent in which ORV use may affect the natural environment. In the past, work has been done by the YFWMB and Yukon Government departments to gain a better understanding of the issues surrounding ORV use. The increasing level of public concern prompted two commissioned reports. In 1997, the Yukon Government's Department of Renewable Resources published a report outlining the many issues related to the use of ORV in Yukon. The study reported negative impacts ranging from the degradation of soil and vegetation, the stress, displacement and increased mortality rates among wildlife populations, conflicts with other trails users, and the proliferation of trail networks (Loeks, 1997). Loeks published a second report on the impacts of ORVs in the Yukon for the YFWMB in 2000. That report outlines impacts that can be directly or indirectly related to irresponsible or excessive ORV use within and around every community in the Yukon (Loeks, 2000). Collectively, findings about the dispersal of impacts and the types of impacts are similar to the research that has taken place in other jurisdictions.

Studies done in other northern regions have examined the specific impacts of ORV use in northern ecosystems similar to the Yukon. Happe, Shea and Loya (1998) assessed ATV impacts within Saint Elias National Park in Alaska. Over a two-year period the study examined impacts to vegetation, soil, and permafrost layers, finding that impacts to vegetation and soils increased as the use of ATVs increased. The study also suggested that the maximum degree of damage occurs after as little as fifty to one

hundred passes per year. Other studies from the Alaskan region highlight various other impacts. Of particular interest are the impacts to northern waterways. Bane (2001) highlighted the implications of ORVs crossing stream beds in Alaska and notes the harm to salmon spawning habitat from the wearing down of embankments, mortality of salmon eggs and fry, widening streambeds and altering the water flow. Other research outside of the north has addressed stream bed impacts due to ORV use. Chin, Rohrer, Marion, and Clingenpeel (2000) studied the effects of ORV use on stream dynamics and found negative impacts related to the structure and habitat quality of stream pools due to accelerated erosion and sediment deposition.

ORV use in wilderness areas also results in impacts to various wildlife populations. Snow machines and ATVs have been reported to displace wildlife from critical habitat areas leading to reduced survival and reproduction rates and contribute to the degradation of important wildlife habitats (Sinnott, 1990). Other studies involving snowmobile impacts on ungulates conclude that snow machines stress the animals to some degree, increasing the risk of energy depletion among the affected animals (Dorrance, Jakimchuck & Carruthers, 1975; Freddy, Whitcomb & Fowler, 1986; McLaren & Green, 1985; Simpson, 1987; Tyler, 1991). Powell (2002) examined the effects of snowmobiles on woodland caribou in the Yukon's southern lakes region. He suggests that the average flight response to disturbance by a cow caribou can cause an increase of 1.2% in daily energy expenditure, a significant amount of energy loss for a wintering caribou (Powell, 2002). Various other impacts have been reported as well. Stokowski and LaPointe (2000) present an extensive literature review of ORV impacts upon natural habitat and wildlife as well as the various social issues that exist including

trail conflicts. Table 1 summarizes the ecological impacts associated with ORV use, the associated behaviours that may cause those impacts and the potential for persuasive communication to address those behaviours as noted by Roggenbuck (1992).

While the aforementioned studies all focused on various areas, populations and ecosystems, the reviewed reports and studies concluded that ORVs have had and will continue to have a significant impact upon wildlife and ecosystems. ORV use is, however, a legitimate and widely accepted form of transport and recreation, particularly in the north, where subsistence living is commonplace and vast open wilderness areas with limited paved access are abundant. In the north, the ORV has become an important part of many peoples' lifestyle, giving people such as the elderly, the disabled and the indolent access to the natural world that would not otherwise have the opportunity. (Happe et al., 1998). They are utilized extensively by the public for hunting, trapping, fishing and general backcountry travel and are imperative for various tourism operations and industrial work (Happe et al., 1998; Loeks, 2000). In addition to using the ORV as a transportation tool, driving ORVs in varied terrain and conditions has become a popular recreational activity (Blahna et al., 2001; Schuett, 1998). It is because of these varied uses that the ORV continues to thrive as a method of travel for off-highway ventures and as a recreational and tourist activity.

### *Management methods*

A number of management strategies and tools have been used throughout Canada to manage the use of motorized vehicles in the wilderness. A report by White (2000) highlights the various legislative and regulatory measures used by several provinces to

Table 1: ORV impacts and the potential effect of persuasion to reduce associated behaviours

<b>Area of concern</b>	<b>Reported ORV Impacts</b>	<b>Potential type of behaviour causing impact</b>	<b>Persuasions potential degree of effectiveness</b>
Wildlife	Stress	Uninformed	Very high
	Displacement from feeding areas	Uninformed	Very high
	Increased mortality rates	Unintentional	Moderate
	Reduced reproduction rates among ungulates	Unintentional	Moderate
Land surface	Degradation of key habitats	Unskilled/uninformed	High-very high
	Degradation of soil and vegetation	Unskilled/uninformed	High-very high
	Proliferation of trail networks	Denial of responsibility	High Moderate
	Accelerated erosion	Unintentional	Moderate
Fish and waterways	Widening of streambeds	Unskilled	High
	Altering water flow	Unskilled	High
	Accelerated erosion	Unintentional	Very high
	Sediment deposition	Unavoidable	Low
Other	Noise pollution	Unavoidable	Low
	Air pollution	Unintentional	Very high

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*Sources: Dorrance, Jakimchuck & Carruthers, 1975; Freddy, Whitcomb & Fowler, 1986; Hendee et al., 1992; McLaren & Green, 1985; Simpson, 1987; Tyler, 1991; Powell, 2002; Roggenbuck, 1992.*

manage motorized off-road use on public land. Most of these jurisdictions utilize sections of various provincial Acts such as the Forest Act in Alberta, the Wildlife Act and Forest Act in British Columbia, and the Parks Act and Wildlife Act in Saskatchewan, (White, 2000). Other approaches, such as trail maintenance and re-routing (Happe et al., 1998), access controls such as signs, gating, and berms (Henschel, 2003), enforcing reduction or restriction of use in problem areas (Cole, Petersen & Lucas, 1987), and changing the types of wilderness use within an area (Hendee et al., 1990) are often available to land and wildlife managers. Wilderness management approaches have been categorized in various ways. Hendee et al. (1990) distinguishes two distinct methods: direct approaches that focus on regulating and restricting the wilderness user, and indirect methods that work towards modifying the behaviours of individual wilderness users. Others, such as Ewert (1999), suggest that the tools, techniques and strategies available in recreational resource management can be divided into three areas; visitor management, site management and information management. Table 2 summarizes the various types of management options under these three broad headings. Referring to information management, Ewert (1999) notes the importance of media outreach tools such as radio, newspaper and public announcements, all of which act as channels for structured messages.

Direct methods of wilderness management such as regulations, area closures and legislative initiatives that limit use often require vigorous political will and commitment from wilderness managers. Yet even with this approach, other issues may inhibit their effectiveness. In the Yukon, the diversified uses of ORVs and the remote and varied locations of most ORV activities make many land management tools ineffective or

Table 2: Management strategies and techniques used for wilderness management

<i>Visitor management</i>	<i>Site management</i>	<i>Information management</i>
<i>Monitoring visitor use</i>	<i>Controlled Use Areas</i>	<i>Media outreach (newspaper, radio, print materials)</i>
<i>Monitoring group size limits</i>	<i>Special Management Areas</i>	<i>Education and training</i>
<i>Regulations</i>	<i>Access Management Areas</i>	<i>Promote responsible use</i>
<i>Legislation</i>	<i>Prohibit new trial establishment</i>	<i>Provide information on current regulations and legislation</i>
<i>Enforcement of Legislation</i>	<i>Access controls such as: Signs, gating, berms, boulders, and bridge removal.</i>	<i>Provide guidelines for Environmentally sound off highway trails</i>
<i>Licensing of ORV</i>	<i>Area closures</i>	<i>Modify and update current Acts and legislation</i>
<i>Restrictions in sensitive areas</i>	<i>Increase the resistance of the resource area</i>	
	<i>Maintain or rehabilitate the resource area</i>	
	<i>Monitoring and assessment of sites used</i>	
	<i>Re-route trails to avoid sensitive habitats</i>	

*Sources: Ewert (1999), Hendee et al. (1990), Happe et al. (1998), Henschel (2003), and Cole et al. (1987).*

impracticable. For example, the enforcement of any restrictive initiative would be extremely difficult and expensive for land management departments to implement. Examples of this can be seen in other areas of Canada. Ontario attempted to implement motorized access controls in order to reduce motorized access to the Temagami forest. A study of the effectiveness of these controls found that there was a 55% violation rate in the area (Henschel, 2003). Regulations and legislation can also be very costly to create and implement (Hendee et al., 1990). Due to the difficulties in creating legislation and the problems associated with enforcing that legislation and the associated costs involved, some jurisdictions have focused on indirect methods to assist with the reduction of impacts related to recreation.

#### *Persuasive communication as a management tool*

Persuasive communication for the purpose of behavioural change has been studied extensively in a broad range of disciplines, including the areas of gender roles (Brooks-Harris, Heesacker, & Mejia-Millan, 1996) drug abuse prevention (Baker, Petty & Gleicher, 1991) and immunization (Colgrove, 1991). In most cases, persuasive communication is utilized when the purpose of the message is to influence and change an individual's attitude towards a particular issue or behaviour. Persuasive communication is often rooted in the premise that by generating a positive attitude towards particular behaviours one can increase the potential for an individual to perform the intended behaviour (Cialdini, Petty & Cacioppo 1981; Ajzen, 1992; Manning, 2003).

Using persuasive communication in the area of natural and recreation resource management has gained increased attention in recent years and has proven to be a viable

option for recreation and land managers. Research in using persuasive communication in resource management suggests it can increase adherence to various resource management objectives (Duncan & Martin, 2002; Fazio, 1979; Manning, 2003; Manfredo, 1992; Moscardo, 1999; Negra & Manning, 1997).

Persuasive communication has been used to promote a variety of attitudes and behaviours that support objectives of land management departments. Tarrant, Overdevest, Bright, Cordell and English (1997) examined the use of persuasive communication to generate favourable attitudes towards ecosystem management among rural residents. They was determined that favourable attitudes towards ecosystem management could be attributed to the strength of the message arguments presented and the degree of personal relevance an individual felt towards the issue. This finding supports the main tenets of the ELM in regards to the importance of message argument and personal relevance in the persuasion of individuals. Research into the effect of persuasive communications within wilderness settings has also suggested that it has the potential to be an effective management tool when applied to various wilderness management issues (e.g., Borrie & Harding, 2002 & Tarrant, et al., 1997). Environmentally-based messages delivered through “real world” situations have been proven to influence behaviour pertaining to park rules. Duncan & Martin (2002) found that signage on trails that display both sanctioned and interpretive messages had an influence upon the wilderness user in increasing the performance of the desired behaviour listed in a message.

Other research focused on changing specific behaviours associated with park and recreation activities have been carried out (Burgess, Clark & Hendee, 1971; Oliver, Roggenbuck & Watson, 1985; Vaske, Donnelly & Deblinger, 1990). More recent studies

have included Wirsching, Leung and Attarian's (2003) study that presented indirect persuasive methods for curbing littering in cultural and natural resource areas. Borrie (2002) presented persuasive communication strategies for managing depreciative behaviour among rock climbers. In many cases persuasive communication did affect the attitudes of individuals when messaging involved the integration of persuasion theory. Yet it is important to remember that behaviour in the backcountry takes many forms; in some cases, persuasive communication may be unable to influence attitude and behaviour in specific instances.

Roggenbuck (1992) has provided a review of literature on the categorization of wilderness visitor behaviour and the potential effectiveness of persuasion on each behaviour type. Five general types of undesirable behaviour have been identified by Hendee et al. (1990): illegal, careless, unskilled, uninformed and unavoidable behaviour. Roggenbuck (1992) explored the effectiveness of persuasive communication on each behaviour type. Of the five types, three are considered to be manageable through the use of persuasive communication. Persuasion's ability to influence careless actions is considered moderate, its effectiveness on unskilled actions is high and its effectiveness on uninformed actions is considered very high. The same approach was also applied to Gramann and Vander Stoep's (1987) typology and categorization of park violations. In this case Roggenbuck (1992) considered three of the six categories to be effectively managed by persuasive communication. The categories listed as unintentional behaviour, uninformed behaviour and behaviours that are a result of the denial of responsibility were all considered to be moderately, highly or very highly susceptible to persuasion. When related to the creation of communication messaging that addresses the irresponsible

actions and behaviours of ORV users, this information is significant. It allows communicators to focus their strategies and messaging on behaviours that can be most readily changed through this management tool.

In most cases, persuasive communication initiatives have been popular among both land managers and special interest groups. Interest groups such as ORV clubs often prefer persuasive communication over regulatory measures because it is less restrictive and is a light-handed management tool that does not directly inhibit the wilderness user (MacLennan, 2000; Manning, 2003; Prospt et al., 1977). Land managers also prefer persuasive communication because of its potential to influence the attitudes, and consequently, the behaviours of wilderness users. In turn, this change in attitude can increase the likelihood of the public identifying with and conforming to specific mandates of government departments. A growing body of research has looked into the effect of communication messaging in various areas of recreation resource management. Crompton and Seong-Seop (2001) studied park visitor's acceptance of park fees through the use of information messages, and curbing littering habits was addressed through persuasive communication by Wirsching et al. (2003). Persuasive communication was also used to generate positive attitudes towards ecosystem management practices in the Chattooga River Basin (Tarrant et al. 1997).

In the case of ORV management in the Yukon, the creation and delivery of persuasive messaging could allow governments to promote low-impact behaviours and control patterns of use in the backcountry without overly restricting wilderness visitors (MacLennan, 2000; Cole, Hammond, & McCool, 1997).

### *The progression of attitude and persuasion research*

The influence and effects of propaganda during World War II prompted much of the earlier research in the area of persuasion communication. The Hovland Tradition presented in the 1950's became one of the more influential experimental research studies during that time period (Ajzen, 1992). Hovland's research isolated key components of the communication process and set up controlled experiments to test the effects of different variables within the communicator, message, channel and receiver. Although later research throughout the 1960's proved the Hovland approach to be somewhat simplistic in its view of the receiver, it none the less influenced the area of persuasion in a significant manner (Eagly & Himmelfarb, 1974; Fishbein & Ajzen, 1975). While few generalizations could ever be made as a result of the Hovland Tradition, the research did identify a number of factors that make up the context of persuasion.

The division of these contextual aspects generated four main factors that contribute to persuasive communication: source factor, message factor, channel factors and receiver factors (Ajzen, 1992). Source factors represent the interpreted characteristics of the communicator, receiver factors embody the characteristics of the receiver, channel factors define the means by which the message is sent and message factors indicate the way in which a message is communicated (Ajzen, 1992). In addition to these traditional context factors of persuasion lie factors that represent situational variables that can often influence a persuasive message. Situational factors such as internal and external distractions and previously known information all contribute to the effectiveness of persuasion.

The combination of these context factors of persuasion must be considered when implementing a communications campaign. However, if the intention of the campaign is to motivate an audience to change their behaviour, one must focus their attention on aspects beyond the contexts of persuasion. While contextual factors contribute to the bulk of any given communication strategy, they fail to take into account the cognitive elements that can lead to a receiver's change in attitude and behaviour. Incorporating context factors exclusively fosters the tradition that the receiver of a message is a passive participant. Classical traditions of persuasion research made the assumption that if one could ensure attention and comprehension of a message that the receiver would absorb the information presented and persuasion would follow (Ajzen, 1992). However, other work in the area of information processing and persuasion has determined that the receiver is far from passive and that individual interpretation, integration and other cognitive processes take place when receiving a message (Nessier, 1976). Therefore, when a message is intended to sway a change in attitude and behaviour it must focus beyond contextual factors and take into account the receiver's capacity for reasoning and their cognitive abilities to process stated arguments. Ajzen (1992) summarizes this idea by noting, "Receiver's exposed to a persuasive communication may engage in an active process of deliberation that involves reviewing the information presented, accepting some arguments, rejecting others, and drawing inferences about issues addressed that go beyond what was mentioned in the original message" (p. 12).

Other theories explaining the cognition of the receiver have also proven to be useful when applied to attitude and behavioural change communications. Festinger (1957) discovered the importance of attitude and belief consistency among individuals

and the affect that this consistency holds in regards to changing behaviour or attitude. Festinger's (1957) Cognitive Dissonance Theory proposes that individuals find comfort in attitude and belief consistency and will cognitively seek out that consistency. This notion is in agreement with the ELM in that it suggests people have a desire to hold attitudes that are considered consistent in that they are considered 'correct' and acceptable to the scheme of the individual (Petty & Cacioppo, 1986). Furthermore, Festinger claims that inconsistency or dissonance in a person's beliefs or attitudes will cause cognitive discomfort and an individual will aim to reduce this inconsistency by changing an attitude or belief (Festinger, 1957). Albarracín & McNatt (2005) support this by noting that, "inconsistencies between the information that enters into the reconstruction and the original attitude can produce changes in prior attitudes, whereas consistency between these elements often elicits stability in prior attitudes" (p. 730). This suggests that the direction of change in attitude can reinforce current attitudes or generate new ones; however, when there is a discrepancy between attitude and behaviour, it is most likely that the attitude will change to accommodate the behaviour (Brehm & Cohen, 1962). If this is true, then changing an individual's attitude towards low impact ORV use becomes critically important if behavioural change is required. Cognitive Dissonance Theory asserts that individuals often avoid processing information that might increase the degree of dissonance between current attitudes, beliefs or behaviours. Therefore, it becomes important for communication messages to consider the current attitudes and beliefs of an audience or individual and attempt to limit the degree of potential dissonance. However, when promoting a position that has a possibility of being inconsistent with an audience's attitude it is important to attempt to limit the degree of

inconsistency. According to Festinger (1957), dissonance can be limited in three ways; by reducing the importance of the dissonant beliefs, by adding consonant beliefs that prevail over the dissonant beliefs or by changing the dissonant beliefs so that they are no longer inconsistent. Focusing on the current attitudes, beliefs and behaviours of the receiver therefore becomes a focal point of message content that seeks to change an individual's attitude and subsequently their behaviour. Yet inconsistencies between message content and an audience's current attitude or behaviour are not the only elements that can reduce the potential for message-based persuasion.

### *Resistance to persuasion*

The effect of attitude and behavioural inconsistencies upon the attitude change process points to an important aspect when attempting to improve the effectiveness of persuasion within a message. Much research has complimented the study and application of persuasion and message-based behaviour change by focusing on elements that contribute to resistance to persuasion. Resistance to persuasion occurs when an individual has undergone no change in response to a message, or has been motivated to produce counter measures to oppose a message (Knowles & Linn, 2004). Petty and Krosnick (1995) consider these forms of resistance as either *active* (generating counter measures) or *passive* (ignoring the message altogether). An active approach is considered when a message recipient attends to inconsistent information carefully and then tries to generate counterarguments to refute it while a more passive approach suggests that recipients might not expose themselves to the presented information, fail to attend to it when exposed, interpret the information in a biased way or reject its validity and reliability (Petty & Krosnick, 1995). Knowles and Linn (2004) add to this by suggesting

that resistance to persuasion occurs based on four main sources; *reactance*, *distrust*, *scrutiny* and *inertia*. A message recipient reacts with resistance when the recipient recognizes that they are being influenced in manner that limits their choices (Brehm, 1966, as cited by Knowles & Linn, 2004). If people are aware of a persuasive attempt they may also resist that attempt by being more careful and thoughtful of the situation and scrutinize message information accordingly (Petty & Cacioppo, 1986). Recipients of persuasive messaging may also resist persuasion if they feel unsure or distrusting of the message's intent (Knowles & Linn, 2004). Yet in other circumstances a recipient may resist persuasion by simply not being motivated enough to care about the message, its content, presentation or subject matter (Knowles & Linn, 2004). By identifying these elements it is then possible to work towards limiting or avoiding them. Knowles and Linn, (2004) suggest resistance can be limited or reduced through strategies such as: postponing change related consequences, by warning that message content is forthcoming, through raising self esteem and self efficacy, by confronting resistance, and by training oneself to appropriately resist persuasion.

The influence of social settings and social groups may also play a role in generating beliefs and attitudes towards issues or resisting messages that counter group attitudes. Social influence theories of attitude and behaviour change are considered a separate area of study when compared to message-based persuasion, and are not the focus of this research. Generally speaking, social influence theories contend that attitudes and behaviours are influenced in group settings. Motivations for this influence include seeking approval from others, a desire to be 'one of the crowd', preferred perceptions of self and peer pressures (Wood, 2000). Some research has also suggested that information

is considered differently when received and retrieved in a group setting compared to a private setting (Wood, 2000). While social influence may play a role in attitude formation it is difficult to manage using mass communications that will be delivered in both group and individual settings.

With so many facets and intricacies related to the effectiveness of message-based persuasion and the attitude and behaviour change process it became clear that a road map for the creation of message content was needed. Messages that hope to limit the degree of persuasion resistance and take advantage of the attitude-behaviour relationship must be based on a thoroughly tested theoretical framework, a framework that not only focuses on the receiver's current cognitive state but outlines the cognitive paths that will lead to long term attitude change.

#### *Theoretical framework*

Accepting that the receiver actively processes and scrutinizes information within a message, current research on persuasion has focused increasingly upon the characteristics of the receiver. One of the most important areas of research involved the exploration of personal attitude which plays a major role in understanding the causes and predictability of behaviour. Most research that has explored the role of attitude in the conduct of behaviour has come to the conclusion that an individual's attitude is one of the foremost indicators of behaviour (Cialdini, Petty & Cacioppo, 1986; Petty & Cacioppo, 1986).

This understanding of the influence of attitude upon behaviour should play a vital role in persuasive message creation. By gaining an understanding of current attitudes towards ORV use among the target population, message arguments may have a greater likelihood of being considered and elaborated on by the target audience. Understanding

this link between attitude and behaviour will also assist in understanding the structure and organization of modern theoretical frameworks of persuasion.

### *The Elaboration Likelihood Model*

The establishment and acknowledgement of the attitude-behaviour relationship allowed various theoretical frameworks to work towards explaining and predicting the processes involved in influencing human behaviour through persuasion. Most theoretical conceptions pertaining to attitude and behaviour have come from the field of social psychology. Of particular interest in this study is the Elaboration Likelihood Model (ELM) created by Cacioppo and Petty (1986). In essence, the ELM promotes the idea that the influences of attitudes towards particular issues often guide the decisions and behaviours of individuals. For use within the ELM, attitudes are defined as “general evaluations people hold in regards to themselves, other people, objects and issues” (Cacioppo & Petty, 1986. p. 127). Through this study, identifying particular attitude indicators will assist in the creation of messages that will reflect the theoretical concepts of the ELM.

### *Two routes of persuasion*

As previously noted, the ELM theory assumes two basic routes of persuasion through which an individual will process information and messaging. These routes and the cognitive paths associated with them are shown in Figure 1. The first is referred to as the central route to persuasion. This cognitive path reflects an individual’s ability to process and elaborate information in a manner that promotes a long-term change in attitude towards a particular behaviour. This route is noted as being the likely result of a

person's careful and thoughtful consideration of a message in support of an advocated position (Petty and Cacioppo, 1986). However, numerous variables influence the extent and involvement of this cognitive path. The central route of persuasion often requires the recipient to partake in effortful cognitive activity; activity whereby the individual must draw from prior experiences, and the knowledge and understanding of an issue in order to scrutinize and evaluate the arguments contained in a message (Petty, McMichael & Brannon, 1992). To increase the potential for this type and depth of cognitive effort to occur in response to a message, the receiver of the message must be motivated to process the message content and have the ability required to process the message. If these processes are achieved and the recipient integrates the message's content into their current attitude and belief structure, the opportunity for central route processing is heightened. In essence, when a high degree of effort and thought is allocated to an issue in order to reach a decision, people are considered to have followed the central route to persuasion.

The second route as outlined in the ELM is referred to as the peripheral route. In this route the individual processes information and forms attitudes based on a low degree of information elaboration. For this to occur the recipient's motivation and/or ability to process message arguments is considered low (Petty & Cacioppo, 1986). Because of this

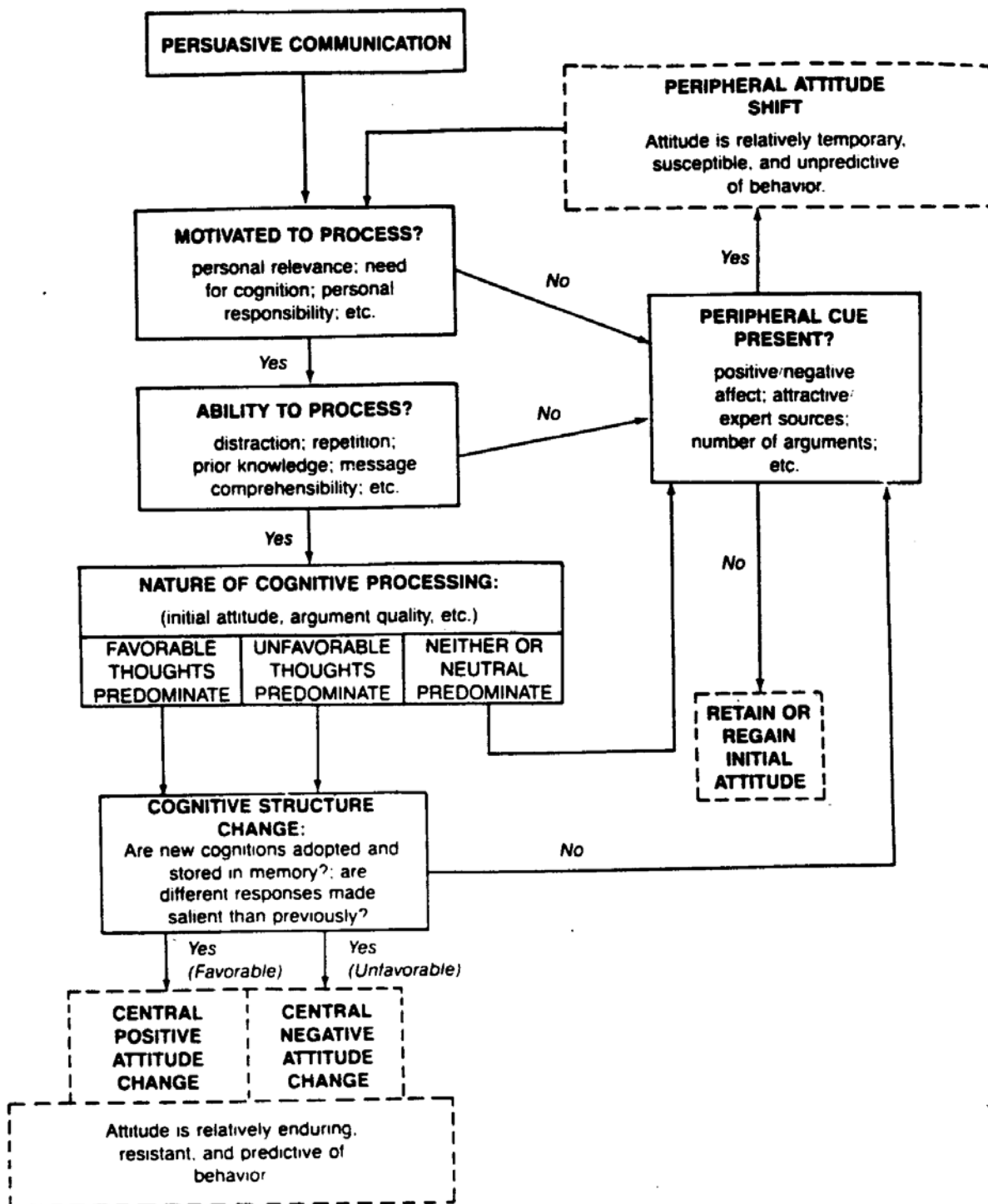


Figure 1: Central and peripheral routes to persuasion within the ELM framework

*Adapted from Petty & Cacioppo (1986)*

the information used to reach a decision is based upon simple cues within the persuasion context (Petty, McMichael & Brannon, 1992). For example, if an individual scrutinizes only part of a message argument or bases their decision solely upon peripheral cues such as the attractiveness of the source, then the cognitive processes involved in reaching that decision is considered to follow the peripheral route (Petty, Rucker, Bizer, & Cacioppo, 2004). Peripheral cues and approaches have been shown to be effective in producing attitude change. Evidence to support the use of peripheral cues for the purposes of attitude change can be seen in advertising effectiveness (Petty, Cacioppo & Schumann, 1983) and web message effectiveness (Duthler & Palmgreen, 2003). The degree of effectiveness of this type of attitude change is of particular interest as Petty et al. (2004) note that, “whether attitude change occurs by the central route or peripheral route has important implications for the strength of the resulting attitude” (p. 66). Attitude changes that result from central route processing tend to be more persistent, resistant to counter arguments, and are more predictive of behaviour (Petty & Cacioppo, 1986).

#### *The seven postulates of the ELM*

Cacioppo and Petty (1986) have divided the ELM into seven postulates (Table 3) based upon the research that has been done in the area of persuasion and communication. Postulate one agrees with past research done by Festinger (1950) suggesting that an individual is motivated to obtain a ‘correct’ attitude or more accurately, the perception that their attitude is correct. In many respects ‘correct attitudes’ are often evaluated upon by the individual through a comparison of the opinions and attitudes of others (Festinger, 1950; Petty & Cacioppo, 1986). In some cases to gain a correct attitude or opinion

individuals may shift their attitude to ensure that it is inline with the attitudes of the majority.

Postulate two notes that although people are motivated to obtain correct attitudes about an issue they are often limited in their motivation to seek and elaborate on issue-relevant arguments contained in a message. It is often easier for an individual to hold the attitudes of the majority or of others who are respected or considered 'correct' rather than seek out and elaborate upon arguments presented by a communication message.

Postulate three comments on the influence of variables upon the amount and direction of attitude change. Specifically, this concept pertains to the variables of argument, cue and elaboration and how these variables affect persuasion. People and specified groups often find different variables and information more or less important to the merits of an argument. When presenting a message to an audience it is imperative to determine what arguments and cues are considered compelling by the audience and determine if a group places more emphasis on a message cue rather than the arguments presented. In essence these determinants can give indications of whether an individual or group will process a message in an objective or biased manner.

Postulate four notes that the variables in postulate three can affect the motivation and ability to process message arguments in an objective manner. When message arguments are strong persuasion can be increased by enhancing argument scrutiny and when weak arguments exist persuasion can be heightened by reducing the degree of scrutiny. In other words, if one intends to increase the persuasive nature of a message they can do so by increasing the strength of arguments within the message to increase

Table 3: The seven postulates of the ELM.

Postulate #	Postulate Title	Brief description
1	Seeking Correctness	<i>People are motivated to hold correct attitudes</i>
2	Variations in Elaboration	<i>Although people want to hold correct attitudes, the amount and nature of issue-relevant elaboration in which people are willing or able to engage to evaluate a message vary with individual and situational factors.</i>
3	Arguments, cues and elaboration	<i>Variables can affect the amount and direction of attitude change by; a) serving as persuasive arguments, b) serving as peripheral cues, and/or c) affecting the extent or direction of issue and argument elaboration</i>
4	Objective elaboration	<i>Variable affecting motivation and/or ability to process a message in a relatively objective manner can do so by either enhancing or reducing argument scrutiny</i>
5	Elaboration versus cues	<i>As motivation and/or ability to process arguments is decreased, peripheral cues become relatively more important determinants of persuasion. Conversely, as argument scrutiny is increased, peripheral cues become relatively less important determinants of persuasion.</i>
6	Biased elaboration	<i>Variable affecting message processing in a relatively biased manner can produce either a positive (favorable) or negative (unfavorable) motivational and/or ability bias to the issue-relevant thoughts attempted.</i>
7	<i>Consequences of elaboration</i>	<i>Attitude changes that result mostly from processing issue-relevant arguments (central route) will show greater temporal persistence, greater prediction of behaviour, and greater resistance to counter persuasion than attitude changes that result mostly from peripheral cues.</i>

Source: Petty and Cacioppo (1986)

the degree of scrutiny that an individual will perform in response to the message.

Postulate five addresses messaging that prompt low motivation and low ability to process. In these instances the ELM notes that peripheral cues such as source credibility and source attractiveness will be the primary factors that determine the degree of persuasion (Cacioppo & Petty, 1986). It should be noted, however, that persuasion through the peripheral route may have little lasting impact on the long-term attitude and behaviour of an individual.

Postulate six, labeled biased elaboration, speaks to the difference between objective and biased processing. This postulate considers variables that tend to affect message processing in a biased manner. Biases often are a result of a person's initial attitude and can produce positive or negative biases (Tesser, 1978 as cited by Petty & Cacioppo, 1986). When a processor adopts a bias, that information often encourages a particular thought that defends the initial attitude. The objective processor discovers the true validity of a message allowing strong arguments to induce persuasion while the biased processor is motivated or able to generate counter arguments in support of an initial attitude (Petty & Cacioppo, 1986). Yet even if a communication is processed with a bias, a strong message argument will have the ability to limit the effect of bias.

Postulate seven examines the differences in persuasive effect between central route processing and peripheral route processing. In this model, central route processing will enact greater elaboration, is considered more predictive of behaviour and creates an attitude that is more resistant to counter arguments when compared to the peripheral route (Cacioppo & Petty, 1986).

For purposes of strengthening positive attitudes towards low-impact ORV use, it was important to ensure that persuasive messages consider the relevant points of these postulates, yet this is often difficult to achieve. Producing effective messaging that adheres to the principles of the ELM while addressing the concerns of the greater population and the impacts to the environment is a challenge that requires an in depth analysis of the target population and the concerns raised by the public. Yet to ensure that a message has the potential to be processed through the central route, it must be thoroughly developed to increase the possibility that the message will induce a high degree of elaboration by the receiver. For this to occur, the recipient must focus a high degree of attention to the content of the message, provide extensive elaboration of the message arguments and integrate the message content into their existing belief system (Manfredo & Bright, 1992; Petty & Cacioppo, 1986).

Through the analysis of various studies pertaining to the concerns and attitudes towards ORV use in the Yukon and similar attitude-focused data collected in other jurisdictions, the attitudes of land managers, the public and ORV users can be identified and applied to the creation of ELM-based messages. In doing so, communication and education interventions can adhere to the principles and concepts associated with the central route to persuasion to promote low-impact behaviours among ORV users.

#### *Fostering Message Elaboration*

Within the ELM framework, Petty and Cacioppo (1986) have identified a number of variables that contribute to the degree of elaboration that may occur when processing a message. The next section attempts to place these variables in the context of the ORV

user content data that has been collected. In order to increase the potential for a message to be processed through the central route, issue-relevant messages must be elaborated on by the receiver. To do this, the message must contain elements that motivate the receiver to scrutinize the arguments within the message and ensure that the receiver has the ability to process the issue-relevant arguments within the message. The conceptual layout of the ELM breaks these components into two distinct elements known as ‘motivation to process’ and ‘ability to process’. The motivation and ability to process a message is a key element within the context of the ELM. Petty and Cacioppo (1986) note that, “When conditions foster people’s motivation and ability to engage in issue-relevant thinking, the elaboration likelihood is said to be high” (p. 122). A high degree of elaboration potentially increases the chances that the message will be allocated enough cognitive resources to permit the receiver to begin to formulate new personal arguments. These new arguments can advocate the content of the message and potentially be integrated into the existing belief structures of the receiver. If this chain of events can occur, then the potential for long-term behavioural change may be achievable. Therefore, it is proposed that by identifying and utilizing factors that contribute to the motivation and ability to process the intended message we can create messaging that has the potential to change behaviour.

Reviews and applications of the ELM have often verified its effectiveness and reliability. Doosje and Siero (1993) confirmed the effect of message elaboration upon the change in attitude towards motor vehicle pollution. Lien (2001) conducted an extensive literature review of the application of the ELM to consumer research and found confirming evidence in its ability to explain advertising effectiveness. Claypool, Mackie,

Garcia-Marques, McIntosh, and Udal (2004) looked specifically at the effect of repetition and personal relevance and determined that by manipulating these variables, message repetition increased processing under high relevance conditions, confirming key principles within the ELM. McNeill and Stoltenberg (1988) tested the ELM in regards to its ability to influence student audiences and determined that the use of high quality messages tended to promote central route processing in the majority of subjects.

### *Criticisms of the ELM*

While the general tenets of the ELM have been proven to be valid and reliable in most cases, it is not without its criticisms. For example, Dulthler and Palmgreen (2003) note that it is unclear among the ELM model whether peripheral cues can be processed at the expense of central cues. Stiff and Boster (1987) also argues that the ELM depicts the receiver as being able to process peripheral cues or message arguments, but not both simultaneously. This contradicts other research by Kahneman (1973) (as cited by Petty, et al., 2004) that indicates receivers are capable of parallel information processing. Petty et al. (2004) refute this criticism by pointing out that while preliminary presentations of the ELM may have overlooked the extend of parallel processing, the model in use today suggests that people process as much information as possible when under high elaboration conditions. Other critics have argued that the ELM seems to “explain all possible outcomes” which makes the model difficult, if not impossible, to prove wrong (Stiff & Boster, 1987, p. 251). Advocates of the ELM assert that with the complex nature of human behaviour and the persuasion process it would be impossible to make precise predictions of behaviour for every variable, in each and every situation that receivers may encounter (Petty et al. 2003; Petty et al., 2004; Petty & Cacioppo, 1986).

### *Conclusions*

Building upon various concepts relating to attitude and behaviour change the ELM focuses on the cognitive processes of the message receiver and recognizes the influence of the receiver's current attitudes upon behaviour. By using the theoretical framework of the ELM, messages can be created in a manner that will significantly increase a messages potential to be processed in a way that fosters elaboration, possibly resulting in a long-term change in behaviour. As noted above, communications that utilize these concepts have been effective in other areas that focus on specific recreational resource objectives. In the case of ORV use, many of the environmental impacts can potentially be limited or even eliminated by generating specific changes in behaviour through the use of communication messages. However, the content of those messages must be consistent with the current attitudes and beliefs of the audience in order to limit the degree of dissonance and increase potential for a change in attitude and subsequently behaviour. This requires a keen insight into the intended audience's current attitudes towards ORV use and careful consideration of the messages content.

## Methods

The research methodology and the general approach to data collection for this study were divided into two distinct phases. Phase one consisted of a conceptual or thematic content analysis of secondary data that explored Yukon-specific information regarding ORV user preferences, attitudes and issues surrounding ORV use and management in the Yukon. This information gave insight into relevant background information of the target audience and highlighted the regionally specific issues that pertained to the use of ORVs. The information also allowed the extraction of relevant information from the sources necessary to create messaging based upon the guiding principles of the ELM.

Content analysis was an ideal methodology in that it allowed building upon past research that was ORV-specific and regionally focused. The method has been used extensively in communications research and is being used with increasing frequency among an array of other research areas (Neuendorf, 2002; Smith, 1992). Content analysis is described as a systematic technique for organizing and categorizing text data based on explicit rules of coding (Krippendorff, 1980; Neuendorf, 2002; Stemler, 2001; Weber, 1990). Specifically, conceptual analysis was used to obtain the explicit information needed to construct the messages. This method allowed for the establishment of the existence and frequency of ORV related themes that connected specifically to ELM based variables. The limitations of conceptual content analysis lie in the potential for text material to be taken out of context and the opportunity exists for the researcher to make inferences that were not intended by the author (Roberts, 1997). This was a significant limitation to consider because the sources being used were potentially already taken out

of context by the authors of the reports analyzed. Unfortunately, specific details of the methodologies used in each of the reports were less than adequate and the level of reliability and validity could not be determined.

### *Phase I Sampling*

Understanding the factors that may motivate an ORV user to process message arguments and the factors that contribute to the receiver's ability to process those arguments is imperative when developing ELM based messaging. Gaining scientifically-measurable indicators for this would have been ideal. However, due to lack of time and resources, the determination of these elements was gained through the content review of secondary sources. Since the text samples used contained content that was collected in a way that was not related to the study's direct purpose the sample used for phase one is described as a non-probability convenience sample (Fico, Lacy & Riffe, 1998). These secondary sources did present some limitations.

All of the documents used were commissioned by government or non-government resource management agencies with specific interests in wildlife and access management. The authors of each report were noted as being independent and nonbiased in their presentation of information. However, their sampling procedures did not focus on ORV users entirely. While they tried to ensure that the diversity of ORV user-types were represented in their interview samples, none of the studies or reports took ample measures to ensure that a representative sample of the ORV user-group was taken. The first source used a sample containing an extensive array of subjects from the resource management sector, First Nations, related interest groups and government biologists. While the list of subjects was extensive, the sample was not made up of strict ORV users.

The second source gathered ORV specific information from other jurisdictions in Canada and Alaska. However, once again data was not gathered directly from the ORV population. The third source of content came from a public survey. While the survey was delivered to the Yukon ORV user, it was also open to the general public. This provided a wider spectrum of information to help determine the underlying concerns of the public but did not allow the researcher to access information that was derived strictly from the ORV population. However, these secondary sources did benefit the study in many ways.

Advantages of using these sources came from their regional focus. Each of the secondary sources obtained information that was related to Yukon Territory and the Yukon population. Being a small jurisdiction in the North, getting information that is specific to Yukon populations is often difficult. The convenience method of sampling also allowed for the collection of a sufficient amount of data in a short period of time and with little expense. Fico, Lacy and Riffe (1998) offer three justifications for using convenience sampling techniques, one of them being when resources limit the ability to generate a random sample of the population. In this case a random sample of ORV users was recognized as being the ideal sample method but time restraints and cost factors would not allow this to take place. In addition to this, it was felt to be important to build upon previous locally focused research and uncover information directly related to the Yukon audience. A general overview of the sources used to obtain information about ORV use in the Yukon follows.

#### *Secondary sources used*

The first source used in phase one was the analysis paper, “*Off-road Vehicle use in the Yukon: Issues scoping study for the Department of Renewable Resources*” by

Loeks (1997). It was created to assist the Yukon Territorial Government in dealing with issues and problems related to ORV use in the Yukon by discussing salient issues and problems associated with their use and to determine if these issues needed to be addressed by government. Input for the report came from a variety of local sources through interviews and questionnaires. Interviews were conducted with land and resource managers, biologists and ORV users within the Yukon, while regionally specific questionnaires were disseminated to community renewable resource offices, conservation officers, regional biologists and local citizens. In total, this review summarized 40 hours of interviews and drew information from 25 completed surveys. Although the selection of the sample group did not require individuals to be ORV users, many of participants were. Regional biologists, conservation officers and many renewable resource council members use ORVs in their work. Conservation officers often check kill sites and patrol the backcountry on ORVs and biologists often use them to gain access to research sites.

The second source used was the Yukon based publication, "*Off- Road Vehicle Use and Issues in the Yukon*" written by Loeks (2000), commissioned by the Access Management Committee, focused on public concerns, issues and impacts of ORVs in the Yukon with a particular focus on how these factors affect fish, wildlife and habitat. The report summarized input from various individuals and organizations throughout the Yukon and attempted to draw conclusions and present solutions for the problems noted. The methods for soliciting input included discussion groups and open ended interviews. The sample group included First Nations, Renewable Resources Councils, community ORV users, and other individuals who were thought to have first hand experience with ORV use in the territory. Government resource managers, conservation officers and

habitat specialists were interviewed and various interest groups, including the Trappers Association, the Yukon Fish and Game Association, the Wilderness Tourism Association, Yukon Outfitters and all off-road vehicle retailers within the Yukon participated in discussions. This source of information was particularly useful because it gave detailed insight into the issues and attitudes that exist among specific regions and communities within the Yukon. It also highlighted the vast differences that existed among the environmental attitudes of various groups and types of users.

The third and final source used in the content analysis was summary data retained from a Yukon wide ORV use survey implemented in 2003. The survey was implemented by the YFWMB over a six month period and explored the issues, concerns and public attitude towards the use of ORVs in the Yukon. The survey was voluntary, distributed to the general public, and contained open ended questions. Over 300 surveys were completed; however, since the number distributed is unknown, the percentage of response is also unknown. During the initial stages of the current study's design, it was anticipated that the raw survey data could be used; however, issues arose with confidentiality and informed consent relating to the use of the original data so only the summary publication could be used. It was felt that the summary data offered adequate insight into the general public's views, attitudes, and concerns towards ORV use and land access.

### *Coding*

Qualitative methods were used to analyze the deeper context and meaning of the information within the sources. Since the intention of the analysis was to extract information that would assist with the development of persuasive communications that

correspond with the theoretical concepts of the ELM, data was coded using an *a priori* approach (Neuendorf, 2002; Weber, 1990). This approach allowed for the establishment of broad theme categories and sub categories that were based on the theoretical concepts within the ELM prior to the initial content analysis. Sampling units were defined by the written content, or a summary of the content within the three sources identified above. Context units were defined as complete or incomplete sentences and all the information within the three documents was analyzed and categorized where applicable. Context units that were related to ORV use, behaviour, or attitude were first extracted from the sources. These context units were then categorized as themes that may or may not contribute to a person's '*motivation to process*' or '*ability to process*' message content. At this point context units were then categorized further.

Key variables that were identified in the ELM to assist '*motivation to process*' and '*ability to process*' were used to form sub-categories for the next level of categorization, including *personal relevance, personal consequence, the need for cognition, personal responsibility and prior knowledge*. Specifically, these variables are said to influence the degree of elaboration in the receiver and can affect which route to persuasion an individual may take. Since the objective of the messaging was to encourage message elaboration in the ORV user groups, the use of these variables as sub-categories was important in order to ensure that the message content would be based upon the tenets of the ELM.

During the initial conceptual analysis another emergent theme was discovered. Specific concerns regarding the use of ORV were raised frequently by all three sources. Due to the consistency and frequency of this theme it was determined that it should be

included in the analysis as its own category. While these context units were not directly associated with ELM based variables they offered detailed insight into the concerns of ORV use within the Yukon. These identified concerns were then used to form the basis for the low-impact pleas in each message.

The identified themes were counted for the number of times they were referred to among the three sources in order to gain insight into the unit's strength and consistency. The information was then ranked depending on the number of times a theme was referred to. Themes under each sub-category with the greatest number of "hits" were incorporated into the message content and were considered to be the issues most broadly related to the target population's motivation and ability to process (Appendix A). Coding methods therefore, allowed for three units of measurement within each code. The first number represents the outlining category that the theme belongs under. The second number represents the number of times the theme was referred to within the sources, measured by the amount of associated context units, and the letter following the numbers represents the sub category that the theme falls under (see Figure 2).

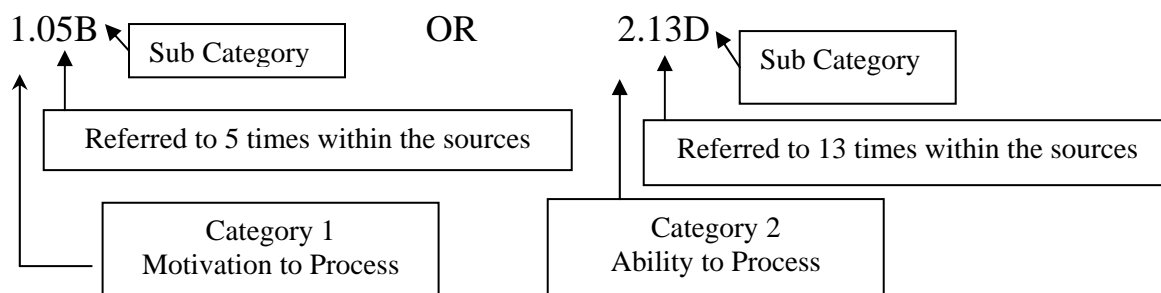


Figure 2. Sample coding method for content analysis of the three sources used

### *Reliability*

To ensure the categorization and interpretation of sample units were reliable from both an external and internal perspective, two methods were employed. Coding methods were first tested for reliability using intra-reliability methods for stability while inter-reliability methods were used for reproducibility. Intra-related reliability was conducted by having the principal researcher repeat the above coding procedures to determine any differences that may have presented themselves. Of the 227 context units identified as ELM related, 23 of them were re-categorized after referring back to the context in which they were made. All 226 context units identified as ORV related concerns remained as such.

To ensure reproducibility and the extent of inter-reliability among the coding methods a second researcher was recruited to independently categorize a portion of the data into the established theme categories. Fifty of the 453 context units were chosen at random and re-categorized by the second researcher. Of the 50 context units, seven were categorized under different headings giving a percentage agreement of 0.86% (43/50). Those seven units were then revisited in the original documents to determine context and then independently categorized again. Three of the seven were categorized in agreement and the remaining four were discarded from the study.

### *Phase II: Message construction and presentation*

Four messages were constructed using the themes and concerns identified in Phase I. Each crafted message addressed concerns identified and the persuasive content for the message was generated by utilizing the ORV specific information of the content analysis. To ensure that a broad spectrum of ORV user specific information was utilized,

each message incorporated a minimum of one theme from each subcategory. The messages were designed to be less than 30 seconds in length and were intended to be delivered in text and audio mediums.

### *Presentation of messages*

To determine if the messages would be effective in initiating message elaboration among the ORV user population, the messages were presented to two focus groups of ORV users. Focus groups are considered one of the most widely used research tools in the social sciences (Stewart & Shamdasani, 1990). The focus group method of data collection was used in phase 2 in order to benefit from the interactions among a group of ORV users. Incorporating and encouraging group interactions produces data and insights that would be less accessible without the interaction found in a group (Morgan, 1988; as cited by Lindolf & Taylor, 2002). For this particular study it was also important to witness the group's initial reaction to each message and note the peer-to-peer conversations and insights that related to and resulted from those messages. Using open ended focus groups allowed the researcher to witness how participants reacted to the message content and offered in-depth information about the participant's views and interpretations of the message content. Krueger and Casey (2000) note that the open ended approach allows subjects ample opportunity to "explain and share experiences, and attitudes" (p.6). The focus groups were limiting in that some participants tried to dominate conversations while others did little to participate. The moderator attempted to limit this occurrence by ensuring that everyone was offered an opportunity to speak on each issue. The reactions and comments of all focus group participants were then transcribed and analyzed.

### *Focus group data analysis*

Focus group responses were first grouped according to the comments made in response to each message. For example, comments made in response to message one formed category one, comments in response to message two formed category two and so on. Each focus group's data remained separated throughout this process. Initial coding procedures then identified various themes that were present in each category. After reviewing the initial themes it was determined that each category contained both message specific comments and comments that pertained to a broader context and therefore themes were separated further into message-specific comments and broader issue comments. All themes were then coded to determine which themes were most prominent (*determined by number of references*), spanned across both focus groups or were particularly dwelled upon by participants (*determined by length of discussion in transcript*). This information was then analyzed for indicators relating to variables that were identified within the ELM as contributing to *motivation to process* and *ability to process*.

### *Focus group sample*

To establish a sample group that was diverse, representative of the ORV user population and large enough to be a viable focus group, a number of methods were used. First, posters were placed in three local stores that specialize in ORV sales. Permission to display the posters was given by the owners of each store and posters were placed on the entrance door or by the cash register. Another poster was placed at the entrance of the local college and an electronic copy was e-mailed to 34 organizations and individuals with a request to forward the poster on to anyone who may be interested. Participants

were required to be Yukon residents and avid ORV users which was defined as using an ORV more than five times within a one year period. Coffee and donuts were offered, and various prizes were donated by local ORV retailers, while other prizes were purchased and used as an incentive for participation in the focus group. One limitation of this sampling strategy was that it utilized self selected participants. Because of this, the potential for participants to arrive with a preconceived agenda, such as to prove that interventions are not needed, provide support for indirect, non restrictive management options, or promote a particular viewpoint regarding ORV use, may be present. This is addressed further in the discussion and conclusion section.

The intent was to have each focus group include between six and 12 participants which is in-line with common focus group protocol (Lindlof & Taylor, 2002). A total of 17 people responded to the requests. However, only 12 participated in the focus groups. An attempt was made to contact the five individuals who did not show up. These individuals were either not at home or could not make the meeting due to family reasons. Of the 12 participants who did attend, one was a female between the age 40 and 50, nine males were between the ages of 18 and 40, one male was over 50, and another male was between the age of 40 and 50. Each focus group consisted of six participants and meetings were held on two different evenings in a classroom at the local college. Due to some of the controversy around the topic, it was important to have the focus groups held in a neutral location that was easily accessible to the public.

The protocols used for each focus group were equivalent. Before the messages were presented, introductions and protocols were reviewed and a brief background letter, (Appendix B), was handed out. All participants signed a consent form, (Appendix C)

before the focus group started. Seats were arranged in a horseshoe formation and messages were presented one at a time on a Power Point screen. A message was presented on the screen and then read aloud by the researcher. The message then remained on the screen and a series of guiding questions (Appendix D) were posed to the group at the discretion of the moderator. The entire session was recorded using digital recording equipment. A video camera was also present; however participants mentioned that they were not comfortable with the camera and so it was removed from both groups. The total length of each session lasted just under ninety minutes.

#### *Guiding questions*

Guiding questions were used by the moderator throughout the session to keep each group focused. The moderator often adjusted and altered the phrasing of the questions to accommodate the topic matter and the group dynamic. The purpose of the guiding questions was to stimulate conversation and discussion. They were also needed to gain an indication of whether or not the group's attitude towards driving ORVs responsibly was altered after hearing and reading the messages.

#### *Gaining insight into the ELM based variables*

To acquire information on the ELM based variables, questions were presented in order to stimulate conversation in the following areas. *Personal relevance* was a significant variable in the study because it is indicated within the ELM as a key factor in promoting persuasive messaging. According to the ELM, *personal relevance* is generated when there is the perception of personal consequence (Petty & Cacioppo, 1986). Specifically, the ELM suggests that “as *personal relevance* increases, people become more motivated to process the issue relevant arguments presented” (Petty & Cacioppo,

1986, p. 146). Some of the guiding questions were designed to generate a direct indication of whether the message content was *personally relevant* to the participants and if so, what part of the message was or was not relevant. The level of *personal consequence* is noted in the ELM to be directly related to the degree of *personal relevance*. Some questions sought to uncover responses to the incorporation of subtle phrases that hinted at losing access to wilderness and presented consequences associated with irresponsible riding.

Another issue that was important to determine was whether the information presented in the messages contradicted any *prior knowledge* that the group may have had. The messages were initially designed to limit the degree of contradiction between the message content and the group's *prior knowledge*. This was difficult to achieve throughout all the messages because the data found in phase one showed that much of the user groups *prior knowledge* in regards to ORV impact contradicted the findings of many current studies on the topic. Therefore contradicting some aspects of the ORV user's *prior knowledge* was necessary. The reaction to this contradicting information was a focus of the analysis.

Certain aspects of the group's current attitude towards ORV use were also explored. This information would help determine if the message content was consistent with the group's general attitude towards ORV use, thus increasing the potential for message elaboration. Petty and Cacioppo (1986) suggests that, "When a message contains information that is consistent with the subjects initial attitudes, high relevance subjects should be more motivated and generally more able to elaborate the strengths of the argument" (p. 128). Thus, if the message and the issue remains highly relevant to the

ORV user and is consistent with their current attitudes towards ORV use, the potential for message elaboration would be increased. One of the guiding questions was also used to determine if the messages contained any assumptions that the group did or did not agree with. Defining these assumptions would also assist in determining if the group's current attitudes towards various actions related to ORV use was being reflected in the messages.

The ELM also suggests that an increase in the degree of *personal responsibility* promotes an increase in the amount of cognitive effort directed towards elaborating upon a message (Petty & Cacioppo, 1986). Promoting a sense of responsibility in regards to low-impact ORV use was thus another focus of the message content. To determine if the data from phase one regarding *personal responsibility* was helpful in promoting message elaboration it was important to gain insight into the group's sense of responsibility towards ORV use and impacts.

In addition to gaining insight into the variables listed above, one of the guiding questions also attempted to determine if the messages had any effect upon the motivation of the group to scrutinize the messages or elaborate upon the message arguments.

#### *Information on ORV related issues*

As noted above, the information from phase one regarding the general concerns identified in the text sources was addressed in each message. In essence, the true purpose of the messages was to motivate the audience to adopt ORV-riding behaviour that would address the main concerns identified in the sources and limit the impact of the activity. Therefore, it was important to gain some understanding about the audience's attitudes towards ORV use and attempt to identify whether the messages might have any effect upon their future behaviour. To acquire information from the group about their attitude

towards ORV use and the potential of the message to motivate a change in behaviour, questions adopted a straight-forward approach. In many cases, the moderator just encouraged discussion that related to attitude and behaviour as it surfaced. When the group began to move away from topic related to ORV use the moderator would often bring them back with a direct question regarding various aspects of ORV use, misuse, and the causes of impacts. Specifically, the question content referred to ORV use around waterways, wildlife and trail networks and were designed to gather information about how this audience viewed the listed actions and the associated potential impacts and if the message had the potential to influence their views. General questions regarding environmental responsibility in the wilderness and low-impact behaviour were used and the moderator attempted to determine what words and phrases within the messages promoted a positive attitude towards low-impact riding and which did not.

## Results

### *Phase I results*

A total of 227 context units were identified as being related to motivation or ability to process and 256 context units were identified as being directly related to ORV related concerns. As noted in the methods section, these units were further categorized into subcategories related to ELM based variables and then ranked based on frequency.

Under the subcategory *personal relevance* the themes referred to most included ‘the accessibility of land for ORV use’, and the notion that ‘there are not enough ORV users in the Yukon to do any significant damage. The subcategory *need for cognition* included, “the need to know that there would be a focus on fairness in the approach that is taken to manage ORV use” and that, “the reduction in instances and severity of impacts can be limited with education”. Finally, the theme under *personal responsibility* that was referred to the most was the idea that only other users caused environmental damage.

The same method was also used to identify information that was related to an individual’s *ability to process* information contained in a message. Under the *ability to process* category only *prior knowledge* was used as an ELM based subcategory. It was determined that other variables that contribute to an individual’s *ability to process* message content, such as *distraction*, could not be determined using the information from the sources used in phase one. Other variables under this category such as *repetition* and *message comprehensibility* were also not used as subcategories for similar reasons.

From the prior knowledge subcategory, one broad theme was found to be the most prevalent. The theme that emerged under the *prior knowledge* subcategory was the notion

that ORVs cause little to no damage to the landscape and any damage that is caused by ORVs is temporary.

### *Concerns*

The top three concerns include the need of ORVs to stay on existing trails, the need for ORVs to cross waterways with caution and the need for ORVs to give wildlife ample space when in the wilderness. These three impacts and the associated actions required to reduce them were addressed in each message. In essence this information provided the persuasive focus of each message. With the persuasive intent of the message confirmed and the audience specific information gathered, it was then possible to construct messages that addressed the environmental impact concerns of the public and utilize the tenets of the ELM to foster message elaboration by the target audience. While similar in intention and format, each message contained unique features that focused on different aspects of the results from the phase one analysis. A break-down of the messages created and the principles and reasoning behind each message is shown below.

### *Messages created with Phase I data*

#### Message I.

*We all have a responsibility to maintain the health and integrity of our wilderness. The use of mountain bikes, horses, ATVs, and snowmobiles can have negative effects on the wilderness if used irresponsibly. Staying on established trails and giving wildlife their space will help reduce your impact and keep the Yukon natural. Do your part, stay on the trail and give wildlife their space.*

Message one begins by incorporating a sense of inclusive responsibility. In addition to ATVers and snowmobilers, users such as horseback riders and mountain

bikers are included as potential causes of negative environmental impact. The potential for negative impacts rather than the inevitability of impact is also stated and the link between irresponsible riding and negative environmental impact is present. The use of words such as “negative effects” and “irresponsibility” are a unique aspect of this message as well. Negative phrasing is not used in the other messages. The message offers suggestions of how to reduce the impacts of the individual and asks the audience to “do their part” to instill a sense of responsibility towards the integrity of the wilderness. The idea that ORVs are not the only vehicle that can cause negative impacts towards the land was an important focus of this message as well. This theme was shown to be strong in data from phase one and thus is present in most of the messages. The intention of this is to identify with the audience and build upon their current attitudes towards wilderness user impacts. The persuasive intent of the message included stay on existing trails and giving wildlife life their space.

#### Message II.

*Accessing the wilderness is an important part of northern living and culture. Today more and more Yukoners are venturing into the wild and our combined impact is dispersing wildlife, creating braided trail networks and damaging water ways. When you go into the wild, please ensure you give wildlife their space, stay on existing trails and move slowly through waterways. Together we can keep the Yukon accessible and natural.*

Message two began by identifying one of the more prominent benefits of ORV use identified in the content analysis and then noted the potential impacts of increased ORV use in the Territory. Message two is the only message that directly implies that damage is occurring and that wilderness users are the cause. It also implies that the

damage being caused is due to combined impacts rather than the individual's impact in order to include a sense of inclusive responsibility to maintaining the integrity of the wilderness. Unlike other messages, this message does not mention any particular wilderness user group. Suggestions to avoid impacts that cause the dispersment of wildlife, braided trail networks and damage to waterways were also presented. The message also suggests that all wilderness users need to work together to ensure the wilderness stays natural and accessible. The intention of this was to subtly suggest that irresponsible wilderness use might lead to limited access, therefore presenting a potential consequence to irresponsible use. This content was drawn from the target group's strong desire for complete and unrestricted wilderness access.

#### Message III.

*The number of wilderness users in the Yukon is growing and the ways that we access the land have changed. We can go farther and faster into the wilderness than ever before. Whether you travel by ATV, snowmobile, boat or 4X4, take the time to move with caution. Stay on existing trails, keep your distance from wildlife and always move slowly through waterways. Let's access the wilderness with respect.*

Message three mentions the increase in wilderness access and implies that there is a need for greater caution when utilizing the backcountry. It attempts to suggest that modern machines carry greater responsibility due to their increased ability to access remote wilderness. The message mentions various other motorized users and calls on every user to move with caution and with respect. It highlights the three priority areas of concern and offers suggestions on ways to limit these impacts. This message also

includes the concept of respect for the land implying that the actions mentioned in the message are respectful.

Message IV.

*Having motorized access to the wilderness is an important part of many Yukon lifestyles. But as the power and affordability of off-road vehicles increase so do the responsibilities of their use. If you use an ATV, snowmobile, or 4x4 to access the wilderness please take the time to drive responsibly. Give wildlife their space, stay on existing trails and move slowly across waterways. The wilderness is a fantastic place to visit, let's keep it accessible, let's keep it natural.*

Message four draws on the values and beliefs of the target group and highlights the benefit of ORV use for northern lifestyles. Once again the intent was to identify with the audience and draw upon their current attitudes towards ORV use. The message attempts to point out the relationship between ORV use and the need for responsible driving. It identifies motorized users only, yet points out various forms of motorized use. As with all of the messages, this one also addresses the three main concerns that emerged from the content analysis. Content also drew from the target group's desire for complete wilderness access and noted the potential for a loss of accessibility to the wilderness. The intention was to present a potential consequence for irresponsible behaviour in the wilderness.

#### *Phase II results*

As previously noted, the purpose of presenting the messages to the focus groups was to determine if there was evidence that the ELM-based message content that was incorporated into the messages contributed to a perceived increase in message

elaboration. In addition, the study examined whether the group's attitude towards driving ORVs was altered after hearing and reading the messages. The findings presented below are separated into sections that highlight the relevant responses of the focus groups to each individual message. Under each message, information is further categorized under headings that reflect ELM-related variables and highlights data that had a broader application and context. Observations were also made in regards to the overall reaction of the audience to the message content.

### *Messages*

#### Message I.

*We all have a responsibility to maintain the health and integrity of our wilderness. The use of mountain bikes, horses, ATVs, and snowmobiles can have negative effects on the wilderness if used irresponsibly. Staying on established trails and giving wildlife their space will help reduce your impact and keep the Yukon natural. Do your part, stay on the trail and give wildlife their space.*

### *Relevancy*

The personal relevancy of message one seemed to decrease according to the activity that an individual participated in and the activity portrayed in the message. The word 'snowmobile' stood out to one participant and as a strict ATV user this made the message seem less relevant. Others in the group noted that chasing wildlife was "obviously irresponsible". This was a common response to "stay on existing trails". A number of participants noted that it was just common sense to stay on trails. Participants mentioned that it was easier traveling on trails and that staying on trails ensured that you would not get lost. Another participant stated that he only rides fast on trails and that his

off-road riding is much slower and more controlled to avoid accidents. If this message content is truly considered “common sense” within the ORV community then the reference to these issues in the message may increase the degree of relevancy of the message in regards to the act of staying on trails. However, the message content regarding limiting the audience’s environmental impact when off-trail did not appear to be overly relevant. Many participants demonstrated that their perceptions of consequence involved situations related to safety and damage to their machine rather than environmental impact. This would indicate that safety and machine damage were more relevant to the audience than environmental impact.

Participants who use their machines for hunting disagreed with the idea of not being able to approach wildlife on their machines. They saw that type of activity as one of the great advantages of hunting with an ORV. ORV hunters within the groups also disagreed with the strict notion of “staying on existing trails”. One participant pointed out that “The reason I use an ATV is to get close to animals”. Participants recognized that the action produces an impact; however, many of the individuals saw some off-road impacts as unavoidable, necessary, required and acceptable.

This implies that the message content related to wildlife and staying on trails was less relevant to the ORV hunter. While they recognized the environmental reasoning behind keeping an ORV on the trail, they felt that the benefit of using an ORV off-trail for retrieving an animal or getting closer to an animal was an acceptable situation. While they recognized that going off-trail had impacts, the majority of the group felt that the impacts caused by going off-trail were acceptable and that “no real significant environmental damage occurs”.

### *Current attitudes*

Comments made during the presentation of the first message also gave an indication of the current attitude of the ORV hunters towards ORV use; these users say ORVs are a tool, and seemed to be willing to accept a high level of impact from using that tool. At the same time, the majority of the group, hunters included, seemed to view the general notion of having ORV stay away from wildlife and staying on trails as acceptable, desirable and obvious. One participant, who was a hunter, noted that the message was “a great message for the ORV recreational rider”. They felt that they agreed with the message content for other users; however, as hunters, they didn’t feel motivated to abide by it.

### *Responsibility*

Message one mentions various motorized and non-motorized uses and the associated impacts of these activities. Addressing the various users seemed to align with the group’s attitude towards the cause of backcountry impacts. Participants were noted as saying, “I’m glad you included mountain bikes...these users cut tree branches and widen trails” and “it is great that you included horses”. Their overall agreement in including other users in the message also points to the sense of responsibility that the participants hold and potentially the lack of responsibility that they feel other wilderness users hold. While they did recognize that negative impacts can be a result of ORV use, they were also adamant about sharing the responsibility of overall impact with other wilderness users. It seemed that admitting that ORVs can cause damage was difficult but reluctantly accepted; this acceptance was difficult because they wanted to avoid being seen as responsible for negative impacts. This poses a challenging situation because from the

perspective of the ELM, a decrease in the amount of personal responsibility for the impacts on wilderness would indicate that the ORV user would be less likely to elaborate upon message content that pertained to decreasing one's impact. Without elaboration, it is unlikely that users would follow the central route to persuasion.

There was an overall view that the ORV community felt threatened by what was referred to as the "green population". One participant was concerned about, "people who consider our responsible use of an ATV as a negative effect". They spoke of greater numbers of "greenies" and non-ORV users who are trying to shut them and their activities down. The defensive nature of the audience demonstrates the need to give ample consideration to the peripheral cues associated with the message content. Cues such as message source and the credibility of that source would likely have an effect on the groups' motivation to process.

Participants noted that they had a sense of responsibility towards maintaining the integrity of the wilderness before seeing the message. They also noted that the responsibilities noted in the message seemed like "common courtesies" and "common knowledge". One participant found relevance in the phrasing "we all have a responsibility in maintaining the health and integrity of our wilderness" yet at the same time did not see any connection between that statement and the plea to stay on existing trails. It seemed that the group's sense of responsibility in regards to ORV impacts tended to shift throughout the session depending on the context. They all seemed to agree with the general message content. However, when applied to their individual situations and activities, they began to generate justifications for actions that were counter to the

recommendations. This was particularly the case with subjects who had a hunting background.

It would seem that message one did get the participants to think about the notion of responsibility and what it meant as an ORV user, indicating the presence of message elaboration. However, this elaboration was often in the direction of the production of counter-arguments against the message plea, although one participant mentioned that if the need for going off-trail is present, they consciously try to stay on rocky ground to limit their impact. Another mentioned that, “when I am hunting I do go off the trail because there aren’t any (trails) where I need to go, but I do stay on solid ground and do not cut through the brush”.

#### *Other observations*

Participants found message one to be generally neutral in its view of ORV use, which assists with the message’s ability to motivate the receiver to elaborate on its content. Some participants found negative connotations within the message because of the use of the words “negative” and “irresponsibility”. One individual felt that these words placed them in a defensive position and the words made assumptions that they did not agree with.

#### Message II.

*Accessing the wilderness is an important part of northern living and culture. Today more and more Yukoners are venturing into the wild and our combined impact is dispersing wildlife, creating braided trail networks and damaging water ways. When you go into the wild please ensure you give wildlife their space, stay on existing trails and move slowly through waterways. Together we can keep the Yukon accessible and natural.*

This message used inclusive words and phrases such as “we can keep it accessible” and recognized the importance of ORVs to the northern lifestyle. Participants felt that this phrasing instilled a “sense of ownership and responsibility” and that it made the message more personal. This was encouraging because creating message content that invoked a sense of *personal responsibility* and *personal relevance* was intended and is a desired quality for a persuasive message.

### *Consequence*

Message two attempted to hint at the idea that the amount of accessibility to wilderness may be dependent on the degree of impact that ORVs cause. The intention was to present a potential consequence for the increased combined impact of trail users. Surprisingly the majority of participants agreed with the idea of using the notion of “limited access to wilderness” as a consequence of increased impacts. Some participants also felt that the incorporation of this consequence within the message was too weak and should be “more of a focus” with the message. Comments around this topic suggested that the reasoning behind this was to ensure that other riders would be fully aware of the potential for regulations, restrictions and limitations of ORV use. Participants felt that the majority of ORV users would choose not to encourage these restrictions. The issue was obviously highly relevant to the participants.

### *Relevance*

Individuals who were only snowmobile users felt that message two weren't very relevant to them. As snowmobile users, they saw little personal relevance to the message content regarding braided trail networks and river crossings. Snowmobile users noted that, “Creek crossings and braided trails really don't matter when I'm on my

snowmobile”. They agreed with what the message said but felt that it was not directed at their type of activity. By the presentation of the second message, it became evident that the various user groups were difficult to capture as a whole. Group participants also suggested that messages directed at ATV and snowmobiles should be separate.

### *Prior knowledge*

Message two was unique in that it clearly stated the impacts caused by increased wilderness users. While it did not mention ORV or motorized transport in the message, the audience still demonstrated a strong disagreement with the impacts suggested in the message. Many of the participants noted their disagreement with the assumptions made about wildlife dispersement, stream bed and waterway damage and braided trails. One participant commented that, “I think we may disturb (wildlife), but they will not be dispersed – they will run but will not run far”. Another proclaimed that, “The message presumes that there is disturbance to wildlife, but these things do not necessarily happen”, while another noted, “Out in the wilderness I don’t see braided trail networks”. Two participants, both ORV hunters, also disagreed with the messages statements and suggested that “ORV use does not cause the impacts mentioned in the message”. One noted past experiences involving their use of ORVs around wildlife and said that the animals did not appear affected by their presence. Other group members also spoke about wildlife encounters and felt that their impact upon wildlife was minimal while half of one group felt that the mentioned impacts were “temporary”. These comments suggest that their attitude towards ORV use is that they cause less damage than what they have been reported to cause, or perhaps ORV users simply do not want to admit these impacts. This may also point to the existence of cognitive dissonance in that if the user acknowledges

these impacts, they may then have to make changes to the way in which they conduct their activity, which could be perceived as restricting.

### *Motivation*

When asked about the effect that the message had on the participant's motivation to ride their ORV responsibly, many of the participants felt that they "already ride their ORV responsibly". Various participants mentioned that their past experiences on an ORV have taught them to be responsible and that the message only reinforced their current sense of responsibility. When referring to the message plea one subject noted that, "experience tells me to do this; I don't need a message to tell me". Subjects talked about the damage caused to their machines from driving through streams too fast, while others noted the necessity for safe and responsible use when in remote regions in order to prevent dangerous situations and fatal injuries. The associations between responsible ORV use and riding experience demonstrate the presence of message scrutiny and elaboration in response to the message content. This was considered a positive outcome because it demonstrates that participants were elaborating on the idea of responsible ORV use even though their motivation to act upon the message recommendation was driven by practicality and safety rather than the desire to limit their environmental impact. This suggests that this message may only reinforce their current understanding of responsible driving and not deliver any new information about avoiding ORV impacts for environmental reasons. The lack of reasoning behind the message appeals may have limited the participant's ability to elaborate on the environmental aspects of the message.

### *Message comprehensibility*

Some of the wording in message two was noted as being difficult to fully understand. One participant found the phrase “braided trails networks” difficult to interpret. The use of “waterways” also made one participant think only of boating impacts. Message two also seemed too long to one of the subjects.

### *Message III.*

*The number of wilderness users in the Yukon is growing and the ways that we access the land have changed. We can go farther and faster into the wilderness than ever before. Whether you travel by ATV, snowmobile, boat or 4X4 take the time to move with caution. Stay on existing trails, keep your distance from wildlife and always move slowly through waterways. Let's access the wilderness with respect.*

### *Consequence*

While discussing the presence of consequence within message three, it was noted that one of the greatest consequences of irresponsible riding is to be ostracized from peer groups. Participants noted that irresponsible riders are often not invited on ORV trips and are looked down upon in the ORV community. They also mentioned that in some ways the message supported this by confirming to the audience that irresponsible riding is wrong and not appropriate. Discussions indicated that, “there are a lot of responsible users out there” and that “many users promote responsible riding and look down on those who are ‘bad apples’”. While participants had noted other scenarios related to consequence previously, this was the first time the group spoke about social influences such as peer pressure.

### *Personal relevance*

Participants in focus group one stated that message three seemed personally relevant to them. Reasons for this degree of relevance seemed to vary from the use of the word “Yukoners” which seemed to make the message more locally focused, to the use of the phrase, “Let’s access the wilderness with respect”. Participants noted that the message content seemed non-threatening because the message mentioned a variety of wilderness users. Some felt that this message seemed more effective in motivating them to ride responsibly because the message seemed clearer about what to do to be responsible. One participant felt that the message, “is straight-forward and it doesn’t ask, it tells you” and this approach had more of an influence on him. This message also seemed effective in aligning with the audiences’ current attitude towards wilderness impacts because it directed its message to a wider user audience. Participants liked the fact that it was directed at all forms of motorized transport. This feedback was similar to what was mentioned in previous message presentations that noted various wilderness uses.

### *Prior Knowledge*

When asked if the information contradicted any of their previous knowledge regarding ORV use, over half of the participants said “no” and that the information reinforced some of the knowledge they already had. It should be noted of course that this message was the third presented and many of the comments regarding the messages recommendations of staying on trails, giving wildlife their space and moving slowly through waterways was talked about at length previously.

Participants particularly liked the idea of telling riders to “slow down” and “move with caution”. The group pointed out that a significant amount of environmental damage

is caused when people are moving too fast. They mentioned the problem with river crossings at high speed and the impact of spinning your tires as well as cornering at high speed. What was interesting about these comments was that participants began to use their past ORV experience and knowledge to explain how to limit environmental impacts. Past ORV experiences seemed to promote responsible use for the benefit of safety and practicality. This shift in the use of prior knowledge may indicate a potential shift in the cognitive effort placed on environmentally responsible behaviour. Unfortunately, whether this shift was due to the content in message three, the repetition of the persuasive content in all three messages or the past discussions related to environmental issues cannot be determined.

#### *Current attitudes*

Eleven of the 12 participants felt that the message was consistent with their current attitudes toward ORV use. Reasons provided included the fact that the message talked about respecting the land, the message didn't portray ORVs as causing negative damage and the message spoke to a wider audience of wilderness users. When asked about message three's overall impact, one participant felt that the message would motivate them to ride more responsibly than would legislation.

#### Message IV.

*Having motorized access to the wilderness is an important part of many Yukon lifestyles. But as the power and affordability of off-road vehicles increase, so do the responsibilities of their use. If you use an ATV, snowmobile, or 4x4 to access the wilderness, please take the time to drive responsibly. Give wildlife their space, stay on existing trails and move*

*slowly across waterways. The wilderness is a fantastic place to visit, let's keep it accessible, let's keep it natural.*

### *Relevance*

Message four started out by noting the importance of motorized access to the wilderness as being part of the “Yukon” lifestyle. This opening phrase seemed to grab the audience’s attention. Participants strongly agreed with the statement and noted that it presented the message at more of a personal level. One participant noted that this made them “want to read on” and that they could “identify with the statement”. They also liked that the message recognized the “many lifestyles” in the Yukon. This of course was noted in previous messages as well and strongly indicates that these types of inferences encourage a high-level of personal relevancy.

The next sentence regarding power and affordability had little impact and seemed to confuse the group. They did not see a correlation between the growing power of ORVs and an increase in responsibility with their use. Participants noted that the sentence “didn’t seem to fit” and that it was “somewhat irrelevant”. Others felt that this section did not add anything to the purpose of the message and that it took their attention away from the other content. This appeared to be evident because a lengthy discussion began about the cost of various ORVs, the financing options available and the expense of various features and options. Obviously this content did little to assist with the intended direction of message elaboration.

### *Responsibility*

The message referred to a request for responsible riding and spoke to the three concerns present in all the messages. The phrase, “take the time to drive responsibly”

seemed to be consistent with the group's attitude towards responsible driving. Many of the participants felt "taking your time" was an important part of responsible riding. They also made reference to the link between speed and the potential for damage to both wilderness and machine. This was noted after reading previous messages as well. Their overall agreement with these phrases seemed to indicate that their current attitudes towards limiting ORV impacts partially reside with the control of speed. This connection was also noted during previous message presentations. The phrase the "wilderness is a fantastic place to visit" also rang true for the majority of participants.

### *Consequence*

The groups were asked about the section that stated, "lets keep it accessible" and whether that phrase appeared to speak to the consequences of limited access to wilderness. Some of the participants mentioned that it hinted at it but not enough to have any impact. Some thought that highlighting the idea that ORV access might be limited if people don't ride responsibly should be more of a focus within the messages. Others felt that the word "access" stood out to them and immediately portrayed the potential for government regulations. This seemed to be the case with the majority of one group because there was much discussion about the word before the questions about it were posed by the moderator. These discussions pointed to the notion that the use of "let's keep it accessible" did spark varying degrees of message elaboration with the groups.

### *Motivation*

When asked if and how the message would motivate them, three participants felt that the message didn't necessarily motivate them to stay on trails or move slowly through waterways because they did that anyway. However, they did feel that the

message motivated them to think about how they ride their ORV. The specific recommendations within the message seemed to be irrelevant, yet the overall message content did foster a degree of elaboration with regards to riding responsibly.

The ELM considers a strong message as a message that contains arguments that produce predominantly favourable elaboration. The ELM also states that, “for positive attitude change to occur, the thoughts should be more favourable than those available prior to message exposure” (Petty & Cacioppo, 1986, p. 133). Looking at the information presented by the group, it does not appear that the message content pertaining to ORV impacts produced predominantly favourable thoughts. However, the group did indicate favourable thoughts towards other elements within the messages.

There were favourable thoughts towards: 1) responsible riding in order to prevent injury; 2) the use of phrases related to the values and benefits of ORV use; 3) the use of “limited access” as a consequence; 4) the inclusion of other wilderness users; and 5) the concept of respecting the land. These issues seemed to produce message elaboration in a more favourable direction and were more consistent with the audiences’ current attitudes, knowledge, and experiences. These issues and topics could therefore be utilized to generate strong arguments that would increase a message’s persuasive potential.

There were favourable thoughts towards responsible riding in order to prevent injury, the use of phrases related to the values and benefits of ORV use, the use of “limited access” as a consequence, the inclusion of other wilderness users and the concept of respecting the land. These issues seemed to produce message elaboration in a more favourable direction and were more consistent with the audiences’ current attitudes,

knowledge, and experiences. These issues and topics could therefore be utilized to generate strong arguments that would increase a messages persuasive potential.

### *Personal Consequence*

There seemed to be no perceived personal consequence attached to the environmental impacts created by off-trail use, stream crossings and approaching wildlife. The personal consequences noted by the participants included issues related to safety, damage to the individual's ORV, or peer pressure. The only consequence to environmental impact was noted as being the legal ramifications involved with harassing wildlife. The lack of data that demonstrated the existence of personal consequence related to environmental impact demonstrates that the potential of the messages to offer a high degree of personal relevancy in the area of environmental concern is limited. Yet this should not be surprising considering that the sense of personal consequence that might be generated by environmental impact would more than likely have to be driven by moral convictions or based on a sense of ownership towards the land. While some comments within the group did provide indications that this sense of ownership and moral conviction towards maintaining the ecological integrity of the land did exist, it did not appear to be particularly strong. The majority of participants either denied the existence of the various environmental impacts caused by the use of ORV, ignored the potential environmental consequences of the impacts or felt that the impacts were temporary or insignificant when compared to other activities.

### *Potential for persuasion*

The research that looks at the success of persuasive messages upon specific behaviour types may also be useful when combined with the views of behaviour found in

the focus group conversations. Information provided by participants gives an indication of present behaviour while operating an ORV and the view of that behaviour including information that identified certain behaviours as the direct result of unskilled actions, illegal actions, uninformed actions or unavoidable situations. These could be classified under four of the five behaviour types identified by Hendee et al. (1990) (Table 1). By classifying the way the group views certain behaviours one is able to determine the potential effectiveness of persuasion on each of those behaviours.

Participants expressed commented on the legal consequences involved with the harassment of wildlife, suggesting the behaviour was viewed as illegal. The advantage of riding experience in limiting some of the ORV impacts upon trails was also mentioned extensively indicating the presence of a collection of unskilled actions that result in significant environmental damage. They also made reference to their knowledge level regarding ORV impacts, indicating specific uninformed actions. Hunters within the group also considered certain off-trail travel and approaching wildlife as unavoidable.

If we refer to Hendee et al. (1990) we can determine the effectiveness that persuasion would have on the perceived actions. Of the four types of actions mentioned in Table 1, two are considered to be manageable through the use of persuasive communication. Persuasion's ability to influence unskilled actions is rated as high by Hendee et al. (1990) and its effectiveness on uninformed actions is considered very high. Therefore, it could be stated that based on the information provided by the focus groups, the inconsistencies shown to exist between perceived impacts and actual impacts (uninformed actions) and the relation between riding experience and responsible ORV use (unskilled actions) could be influenced by persuasion.

The same approach could also be applied to Gramann and Vander Stoep's (1987) typology and categorization of park violations. Categories listed as unintentional behaviour, uninformed behaviour and behaviours that are a result of the denial of responsibility are said to be moderately, highly or very highly susceptible to persuasive messages. If we accept the notion that the implications of ORV use contradict the beliefs of the ORV user, then it could be suggested that a portion of the impacts related to ORV use are partially the result of uninformed or unintentional actions. However, the messages presented did not seem to achieve a persuasive influence over the attitudes towards those actions. Instead it appeared that the exposure to the message content produced a collection of counter arguments among the focus groups.

These counter-arguments could be the result of dissonance between the beliefs of the ORV user and the environmental implications of their activity. Cognitive dissonance theory was introduced by Festinger (1957) and explores the significance of two elements that are inconsistent due to the knowledge of one suggesting the opposite of the other. Information that disconfirms a belief that is personally significant can cause a person to seek justification for the initial belief (Petty and Cacioppo, 1996). This justification could lead to counter arguments against the content of the message. To limit these counter arguments, Festinger (1957) suggests that increasing the attractiveness of the chosen alternative (low-impact riding) may reduce the degree of dissonance.

The type and reasoning behind these counter arguments are important to note. In most cases the types of counter arguments generated from message content related to crossing water ways, approaching wildlife and staying on existing trails, and were often based on current hunting practice, common sense or general disagreement with the

requested action. The generation of these counter-arguments in response to the messages indicates that the focus group members disagree with the objective content of the messages. In other words, part of the message content was drastically different than the participant's initial attitudes towards the actions mentioned. Because of this difference it is possible that the audience may have processed the information in a biased manner.

Biased processing is identified in the ELM and addressed in postulate six (see Table 4); audiences can process message content in a biased manner and often that bias is a result of the individual's initial attitude (Petty & Cacioppo, 1986). The ELM makes a clear distinction between biased and objective processors. The objective processor is noted as being motivated and able to discover the "true validity" of a message while a biased processor is often motivated or able to generate thoughts that defend the processor's initial attitude (Petty & Cacioppo, 1986). The reactions and the counter arguments presented by the focus groups suggest that the participants were preoccupied with enforcing their own attitudes and unwilling to process information that was inconsistent with their current attitudes. However, this does not mean that the presentation of the messages had no persuasive effect on the group. Even when messages are processed with a bias they still have the ability to limit the degree of bias. Knowing how much of an effect these messages had on the audience's level of bias is beyond the scope of this study, but perhaps an important area to consider in future studies.

### *Conclusion*

Content related to the general notion of respecting the land and limiting perceived irresponsible riding impacts seemed to generate a significant amount of message elaboration in an intended direction. This could indicate that the ORV specific

information gathered in phase one did assist with the persuasive potential of the messages in some cases.

First, we must consider how the messages were created. The data collected from the phase one content analysis consisted of a collection of themes that were related to initial attitudes of the ORV user as well as the concerns mentioned in the phase one text sources. These themes were then incorporated into the content of the messages that were presented to the focus groups. Evidence from the initial analysis showed that the focus group participants had elaborated on certain themes within the messages. Some of this elaboration was positive and in the intended direction yet other message elaboration seemed to occur in a biased manner. Consequently, this biased processing initiated a series of counter arguments that were consistent with the general attitudes identified in the phase one data analysis. Table 4 displays the themes used in message creation and identifies whether there was evidence to suggest message elaboration and, if so, if there was elaboration in support of or against the message arguments.

All of the themes presented were elaborated upon to some degree. This was not surprising due to the study environment and the methods used to present the messages. On occasion, the audience would be prompted to speak on certain topics which enhanced the opportunity for message elaboration in those areas. However, what appears to be the most interesting and applicable outcome of this study is the direction of elaboration that took place, demonstrating the effectiveness of the themes in providing persuasive content that achieves the intent of the message. From the data collected, it appears that half of the themes used produced positive elaborations while the other half produced elaboration that moved the participant away from the message's intent.

The incorporated themes that produced elaboration in the intended direction included the acknowledgement that ORVs offer numerous benefits to the user, demonstrating fairness in the approach that is taken to manage ORV use, and the need for ORVs to cross waterways with caution. These themes seemed to be consistent with focus group members' current attitudes in those areas. Themes that produced elaboration in the unintended direction included, the belief that there are not enough ORV users in the Yukon to do any significant damage; ORVs cause little to no damage to the landscape and any damage that is caused by ORVs is temporary; the lack of need for ORVs to stay on existing trails; and the lack of need for ORV riders to give wildlife ample space when in the wilderness. The difference in these two sets of themes is that the themes that produced positive elaboration were predominantly value-based while the themes that produced negative elaborations were predominantly behavioural-based. Therefore, it could be stated that in general, the messages provide content that reinforce existing positive values related to ORV use, but also contain content that contradicted some initial attitudes of the ORV user, which created an atmosphere that fostered biased processing and the creation of counter arguments.

Table 4: Evidence and direction of message elaboration in response to persuasive messages

Themes	Evidence to suggest message elaboration. Y(yes)/N(no)	Elaboration positive (+) / negative (-) towards the intended recommendation
<b>The accessibility of land for ORV use'</b> ( <i>personal relevance</i> )	Y	+
<b>There are not enough ORV users in the Yukon to do any significant damage</b> ( <i>personal relevance</i> ) ( <i>prior knowledge</i> )	Y	-
<b>ORV offers numerous benefits to the user.</b> ( <i>personal relevance</i> )	Y	+
<b>The need to know that there would be a focus on fairness in the approach that is taken to manage ORV use'</b> ( <i>need for cognition</i> )	Y	+
<b>The reduction in instances and severity of impacts can be limited with education</b> ( <i>need for cognition</i> )	Not directly incorporated into messages	
<b>It is not the ORV riders known to the user and/or the ORV user in general that cause environmental damage but rather other recreation groups and wilderness users.</b> ( <i>personal responsibility</i> )	Y	+ & -
<b>ORVs cause little to no damage to the landscape and any damage that is caused by ORVs is temporary</b> ( <i>prior knowledge</i> )	Y	-
Public concerns <b>The need of ORVs to stay on existing trails,</b>	Y	-
<b>The need for ORVs to cross waterways with caution</b>	Y	+
<b>The need for ORVs to give wildlife ample space when in the wilderness.</b>	Y	-

## Discussion and Conclusion

The incorporation of information gathered in phase one and the focus on utilizing the tenets of the ELM allowed for a planned message structure that attempted to persuade an ORV audience to adopt positive attitudes towards specific low-impact riding actions. The messages were intended to be *personally relevant*, consistent with the audiences current attitudes towards ORV use and instill a sense of *personal responsibility* towards riding responsibly. According to the ELM, incorporating these elements improves the message's potential to be elaborated on by the intended audience. The methods used to collect user-specific data produced the intended results in that the process produced information that was personally relevant to the audience, gave indications of issues related to personal responsibility, provided information that was consistent with the target audience's cognition and offered insight in regards to the ORV users' prior knowledge. The application of these variables to the message content in order to have the audience elaborate on the content was also achieved.

The discussions from the focus groups seemed to provide a collection of insights that could be seen as indications of elaboration upon the content of the messages. However, as noted by the second postulate, message elaboration is considered by the ELM to exist on a continuum. Therefore it seemed necessary to consider the degree of elaboration adopted by the audience. In the discussions, certain issues and message pleas were discussed more than others, which is one indication of the extent of message elaboration. For example, in response to the majority of the messages, the group consistently referred to the types of impacts noted within the message. While their extensive comments may indicate message elaboration, the direction of that elaboration

often moved away from the persuasive purpose of the messages. The messages were intended to produce elaboration towards the issue of lowering ones' impact and having the audience consider altering their riding behaviour in order to address the concerns raised in the text sources. However, many of the comments focused around disputing the existence and the severity of the impacts suggested. This seems to indicate that the persuasive intent of the messages or the direction of the message elaboration was not fulfilled. These messages relating to impact seemed to produce a cognitive environment that let the audience to process this content with a bias. This could have been a result of the differences between the initial attitudes of the target audience and the pleas within the message. If so, in order for the audience to process the messages objectively, the content derived from the noted concerns would have to be eliminated or altered significantly.

Various factors have been documented to produce biased processing of message arguments, including recipients' broader values (Eagly & Kulesa 1997, as cited by Wood, 2000), self-interests (Giner-Sorolla & Chaiken 1997 as cited by Wood, 2000), and attitude issues that are highly important and involving (Zuwerink & Devine 1996 as cited by Wood, 2000). All of these factors could be applied to the participating ORV users. The participants demonstrated that they held a broader value base related to access to wilderness, they shared a high degree of self interest relating to their activity and demonstrated the importance of ORV use.

In addition to these factors, one might explain the message content pertaining to the ORV-related concerns being processed with a bias as a means to reinforce the initial attitudes of the audience. Cognitive Dissonance Theory was highlighted as a model that could help with changing this occurrence if the counter arguments produced were the

result of dissonance between the beliefs of the ORV user and the environmental implications of their activity. According to the theory, dissonance occurs when relations between two elements are determined by an individual's subjective expectations regarding them rather than by their logical interrelationships (Petty & Cacioppo, 1996). In this case, it would appear that the relationship between ORV use and the associated impacts among the focus group demonstrated this relationship. Proof of this occurrence can be seen by participants mentioning their belief that ORVs do not disperse or disturb wildlife, yet noting situations when wildlife ran from their machines. The occurrence of this dissonance should be carefully considered in future research. Festinger (1957) points out that cognitive dissonance will often give rise to activity oriented toward reducing or eliminating the dissonance (Festinger, as cited by Petty & Cacioppo, 1996). The dissonance in this case maybe that the subjective beliefs of ORV users allow them to believe that ORVs don't disturb wildlife and therefore their actions among wildlife would reflect that belief and ignore the subtle signs of wildlife distress or displacement. However, if information regarding the effect of these actions could convince the user otherwise, the reduction in dissonance may move towards more of an objective evaluation of these instances such as deciding that wildlife running from an ORV is disturbing to the animal.

The majority of ORV users in this study viewed certain actions as necessary or unavoidable and viewed some associated ecological impacts as insignificant and/or temporary. It is this understanding of specific actions and impacts that form the challenging aspects of the ORV user's initial attitude towards environmentally responsible use. They seem to view actions such as going off-trail or approaching wildlife

as acceptable providing these actions don't produce extensive visual impacts. Yet this was not the way in which these actions were portrayed in the message content. Unfortunately, the incorporation of these specific actions within the messages seemed to only strengthen the initial attitudes of the audience.

It could be suggested that the intended audience holds a strong attitude towards the use of ORV in the Yukon. Consistencies around this attitude can be witnessed throughout the focus group discussions. The mention of ORV causing little to no impact, the desire to maintain full access to the wilderness and various other statements promoting the use of ORV all support and demonstrate the existence of a strong initial attitude towards the unrestrictive use of ORVs. The majority of the message content that was rejected by the focus group was in certain ways inconsistent with these beliefs and therefore produced various counter arguments. The production of these counter arguments and the active approach taken to pronounce them points to the existence of an active act of resistance to persuasion. According to Knowles and Linn's (2005) sources of resistance to persuasion, this occurrence seemed to stem from *reactance* and *distrust*. The audience seemed to be reacting to a plea that could potentially limit their freedoms as ORV users and/or they may distrust the intent of the message or the messenger.

Perhaps of more importance is determining why respondents hold the views and beliefs that they do. For example, why does the ORV population believe that ORV use is not causing any damage to the wilderness? One reason can be found by comparing certain attitudes and beliefs of the participants. If we compare the attitude towards a 'general respect for the land' to the belief that, 'ORVs cause little damage to the environment' we see that the belief is consistent with the attitude. Keeping in mind that a

strong overall attitude towards unrestrictive use of ORVs exists, in order to change the belief mentioned above, the messages would have to create an inconsistency between current belief and current attitude. Participants often referred to themselves as conscious and respectful of the environment, wildlife and the wilderness. They noted their desire to be in the wilderness and the enjoyment they get from being there, indicating that this was a strong and consistent self-perception. It would therefore be difficult for an individual with this self-perception to admit to an action that would be directly in contrast or in conflict with their attitude scheme. Yet, if their attitude towards the land is stronger and more resistant to change than their attitude towards ORV impacts then there remains the potential for a change in attitude towards ORV impacts to occur. Perhaps communications must first strengthen the existing pro-environmental beliefs and attitudes of the population before any significant attitude change relating to riding behaviour can occur through message-based persuasion.

The influence of social settings and social groups may have also played a role in generating the views and beliefs of the participants. While social influence theories of attitude and behaviour change are considered a separate school of thought when compared to message-based persuasion and beyond the scope of this study they should be noted. Generally speaking, social influence theories contend that attitudes and behaviours are influenced in group settings by an individual seeking approval from others and that information is considered differently when received and retrieved in a group setting compared to a private setting (Wood, 2000). Since the focus groups were a self-selective sample and potentially had preconceptions and motivations for participating, the opportunity for strong social pressures within the group may have existed. Some

responses may therefore not represent some of the true internal attitudes or beliefs that may exist. Or perhaps the current attitudes and beliefs of the participants are a result of the social influences among their peers.

### *Application*

The use of communication messages to address the level of impacts due to ORV use has the potential to be effective. However, the message content would have to change its focus. Because the topic and activity is highly relevant to the intended audience, the opportunity for messages to be elaborated on is high. The focus of those messages however, should be considered carefully. In this study it seemed that some of the message content was interpreted as being too far from their initial attitudes. The inconsistencies that existed between certain message content and the audience's current attitude appeared too great for the intended attitude change to occur. While addressing the specific concerns reported by the text sources was important, addressing those concerns directly may not be the best way to approach the issue. It would appear that there are significant differences in the values, beliefs and perspectives of the general public and the ORV user when it comes to acceptable levels and types of impact (Loeks, 2000). These differences seem to be polarized in many areas and because of this; the ORV population often feels defensive about their activity, which assists with the strengthening of initial values and attitudes in response to arguments that are contrary.

However, the content analysis and the focus groups offered insight into various other attitudes and values that seem to be generally consistent with the environmentally concerned citizen. Content related to respect for the land and the importance of overall responsible use seemed to produce elaboration in the intended direction. If these general

values and attitudes were the focus of messages then it is possible that the message may have more of a positive effect towards limiting the environmental impacts of ORV users. The messages would not necessarily demonstrate that the specific concerns of the public are being addressed directly, but they could influence the overall environmental attitude and values of the audience. While this general messaging may lack the ability to recommend specific changes in behaviour, it would assist with influencing the audience's view of the environment and their actions within it.

### *Audience*

The intended audience for the messaging included two main groups of motorized wilderness users, ATV users and snowmobile users. Both users were included in the study in order to cast a larger net for the sample groups used and to attempt to address motorized impacts in a more broad sense. While this did produce results that offered useful information regarding both groups, the effectiveness of the messaging was limited. While the two groups do share certain attitudes towards the use of motorized transport in the wilderness, it became apparent that the personal relevance of particular recommendations was viewed quite differently among the groups. Snowmobile users saw little relevance to recommendations regarding stream crossings or the need to stay on existing trails. While staying on existing snowmobile tracks does significantly limit the extent of environmental impact, the audience seemed to associate the plea with summer travel only. Future communications should take a different approach. For messaging to maximize its persuasive ability it should be specifically orientated to the particular activity and its associated users and impacts.

### *Prior knowledge*

The current understanding of the impacts of ORV use among the ORV user population is a critical area that should also be addressed. There appears to be frequent inconsistencies between the environmental impacts acknowledged by the ORV user and impacts reported in the literature. Some participants acknowledged the impacts caused by ORVs, but believed those impacts were acceptable in particular situations. This is particularly evident in regards to the impacts of ORVs around wildlife and of the use of ORVs off-trail. Participants were noted as saying, “when I am hunting I must go off the trail”, and “the less space between me and wildlife when I am hunting the better”, as well as, “I may be the only person that rides off the trail [in a remote area] so what impact am I having?”. Persuasive messaging related to reducing impacts will have a very limited range of influence if these inconsistencies are not addressed. One potential cause of this may be the lack of visual evidence that demonstrates that impact has occurred (Farrell, Hall & White, 2001). Comments show that many users feel that any impacts that do occur are temporary in nature or are considered to be acceptable levels of impact. Participants noted, “When I drive off trail and look back, there is no damage”, “new trails that I make to get into remote areas always grow back the next year” and “I don’t see anything wrong with going off trail, it’s the only way to get away from other people”. Since these impacts have little obvious signs of immediate degradation following ORV use they rarely register with the ORV user as being an issue of concern. However, there was evidence to support the notion that ORV users do have a general sense of environmental responsibility, which is in agreement with other studies regarding ORV users. Schuett (1998) found that 50 percent of ORV users interviewed felt that

environmental issues were very important to them. Therefore, there is potential to build upon these attitudes with the use of persuasive messaging in order to influence other attitudes regarding the acceptance and acknowledgment of ORV impacts. To address this, messaging could focus on justifying the types and levels of impact that can occur from particular types of actions rather than just implying that these impacts occur. This may give some users enough objective reasoning to reconsider their beliefs regarding the degree of impact that may occur from certain actions.

During the initial content analysis there was an indication that ORV users approved of the use of education to teach riders to limit their impacts. This was also found by Loeks (2000) and the YFWMB (2003). While this theme was not directly utilized in the message content, the fact that it exists is encouraging. Since the ORV population is receptive to the idea of education, there remains the possibility to address many inconsistencies and misconceptions with educational initiatives. The information obtained through the study's content analysis and the focus group feedback could also assist in this area. Not only are many of the misconceptions about impacts identified but other evidence may exist to help in the creation and delivery of educational initiatives. If the inconsistencies between the ORV user's perception of impact and actual impacts can be lessened, the potential for persuasive messages to be successful in promoting low-impact riding may increase.

#### *Study environment*

For the purposes of this study messages were presented to the audience in a semi-controlled environment. The audience was aware of the activity, had little distraction and some of the message content was often repeated throughout the messages. These factors

have a significant effect upon the cognitive processes of the audience. The audience was instructed to read and hear the messages which would not be the case if the messages were heard on the radio or printed in a newspaper. In addition to this, ELM variables such as message repetition and message comprehensibility were not tested or observed in the study, yet have been known to affect message elaboration (Petty & Cacioppo, 1986). Therefore, it should be noted that the way in which the focus group was conducted, enhanced the opportunity for message elaboration. It is doubtful that any message delivered in a “real world” setting would produce the same degree and consistency of elaboration. While this was taken into account during the study, the exact influence and impact of the study’s environment could not be determined. Yet other studies have found that environmentally based messages delivered through “real world” situations do have a positive effect upon audiences. For example, Duncan & Martin (2002) found that signage on trails were effective in having wilderness users perform the desired behaviour listed in the message.

Particular interest should be taken in regards to the delivery of the message. The data in this study suggests that the ORV audience is more likely to process a message that is delivered by an organization with common values and similar views. The credibility of the message author will be noticed and will have an effect on the way in which the message is received. This is confirmed by Eagly & Himmelfarb (1974), Petty & Cacioppo (1986), Petty & Cacioppo (1996) and others. Unfortunately, the Yukon does not have an ORV association or another organized group who holds an interest in ORV use. In fact there are few agencies that would be considered credible by the ORV population. The Klondike Snowmobile Association was suggested to have a credible

reputation among the snowmobile population, but as noted in the study, this association has little relevance to the ATV user. The Fish and Game Association could be used, but this organization would more than likely be ignored by the strict recreational rider because of the differences in the type of riding. The absence of an acceptable and creditable organization to deliver messages in Yukon is problematic.

An organization focused on ORV issues would be an important part of any overall strategy to limit ORV impacts. Such an organization would not only bring a voice to the ORV population, but it could also act as a conduit for information and education related to environmental impacts, responsible riding techniques and even safety. It would also allow for a more structured organization of peers so that the new ORV user could be introduced to experienced riders with knowledge in the areas of responsible riding. Of course, such an organization could also be used as a support structure for the ORV population, allowing them to feel less threatened by the more organized and often vocal environmental movement. However, such an organization may only have an influence upon a portion of the ORV population.

### *Consequence*

Consequence is noted in the ELM to have a direct effect upon the personal relevance of an issue, and personal relevance is noted as being the most important variable in the effectiveness of persuasive communications (Petty & Cacioppo, 1986). The information provided showed that there was little *personal consequence* associated with the environmental impact of ORV use. The legal consequence related to “harassing wildlife” was mentioned, but it was later noted that the definition of harassment often varies depending on situational factors. Hunters, for example, noted that approaching

wildlife on an ORV during a hunt was acceptable. In the literature review it was noted that persuasive messaging was an ideal management tool for ORV use because policing the activity is extremely difficult in the Yukon due to the vast amount of land and that there is only one law that addresses one particular type of environmental impact. Looking at the results from this study it now seems that the lack of laws could have an effect on the adherence to environmentally responsible riding. Because of the lack of legal consequence the ORV user is limited in his or her ability to attach any personal consequence to their actions in regards to the environment. Blahna (2001) found that one third of Utah ORV respondents felt there should be more law enforcement in ORV areas which may suggest certain laws may be accepted more than regulation or restriction.

There was obvious concern against any restrictive legislation that pertained to ORV access, which was also found by Blahna (2001). However, the application of laws that protect the integrity of the land would not necessarily have to limit the amount of access. Instead, these laws could present legal consequences to purposeful actions that damage waterways, tear up vegetation, soils or other natural structures. These laws would introduce a sense of personal consequence that might register with the user and could reinforce the notion of low-impact riding without limiting the access of the user. Even though these laws would be difficult to enforce, they would assist with getting the ORV user to think about their actions in a more personal context.

### *Conclusion*

The use of persuasive messaging holds great potential for increasing the environmentally responsible use of ORVs. Participants in this study demonstrated that their sense of environmental responsibility and overall respect for the land was high and

that issues surrounding these areas are personally relevant to them. However, it remains unclear if their attitude towards respecting the land and wilderness is strong enough to support further attitude change in this direction particularly if this change in attitude requires a decrease in ORV freedom of movement.

Information and knowledge gained from this study will be practical in planning, testing and implementing communication strategies related to ORV use in the Yukon. In addition, the ELM could also be adapted to a variety of other recreation resource management issues and objectives. The use of secondary sources was convenient and affordable; however, they did prove to have some limitations when used for creating content for persuasive messages. Future communication endeavours should build upon and utilize regionally-based research sources; however, obtaining additional audience information may increase the effectiveness of achieving attitude change through the use of persuasive messages. Of particular importance might be information that identifies the ORV population's environmental attitudes, the strength of those attitudes and the level of consistency among those attitudes.

The complexity of attitude and behavioural change processes should not be overlooked. The application of any communication initiative that intends to alter the behaviour of ORV users should be tested extensively to ensure that messages generate a limited amount of counter arguments. Too many counter arguments in response to message pleas may only strengthen initial attitudes rather than influence them in the intended direction. While persuasive communications do hold immense potential as a relatively non-controversial management tool for ORV use, its effectiveness would have a stronger influence if combined with other, more traditional management tools. Future

research in this area should also look into delivery methods for persuasive communication messaging and perhaps determine how persuasive communications can be incorporated into existing management strategies.

The establishment of laws that address blatant irresponsible use may also be useful and would more than likely be supported by the ORV population if they were perceived as non-restrictive. Developing a system of self-monitoring and self-policing among the ORV population may also provide enough perceived personal consequence to heighten the degree of attention to messages that promote environmentally responsible riding. The ability of regional management bodies and government to implement local or specific restrictions on the basis of environmental concern may also help strengthen the degree of *personal relevance*, *personal responsibility* and *personal consequence* related to responsible ORV use.

Other recommendations that would assist with the indirect management of ORV use include:

- Providing regionally-based management bodies such as Renewable Resources Councils and First Nation governments with a communications tool kit. This kit would provide these organizations with step-by-step procedures for researching, developing, testing and delivering communication initiatives that address locally raised concerns.
- Gathering additional data on the ORV user that can assist with determining additional attitudes towards ORV use, the conservation of land and wildlife and the perception of ORV related damage.

- Develop a series of educational initiatives that respond to some of the misconceptions that surround the environmental impact of ORVs. The more the ORV population is informed about sensitive terrain, environmentally safe riding techniques, and potential impacts of specific actions the more likely they may be to elaborate upon future messages in the intended direction.
- Set up a registration and licensing system for all ORVs in the Yukon. This would allow for accurate numbers of ORV users, allow for Yukon-based ORV specific statistics and assist with determining the needs of the ORV population. Such a system would also instill more personal responsibility among riders. If set up similar to regular vehicle registration, the system would also prove valuable in being a starting point for the dissemination of ORV specific information pertaining the responsible use.
- Help establish an ORV association that would be responsible for the dissemination of environmentally specific information regarding the use of ORVs to the greater ORV population.
- Encourage government to utilize information management and persuasive messaging to its full potential.

### *Future Research*

Future research is needed in a number of areas relating to message-based ORV management. Obtaining more specific information about the Yukon ORV user would assist with various aspects of message-based persuasion strategies. Little information currently exists regarding ORV user's information collection methods, user demographics, and riding preferences. A valid and reliable Yukon wide random survey of

ORV users could obtain this kind of information and would offer more accurate data for future message creation and delivery. The secondary and third party data that does exist is convenient but is limited in its range of use, reliability and communications focus.

The degree and impact of societal influences among the ORV user population is another area in need of further inquiry. Theoretical frameworks like the ELM can increase the potential for message-based persuasion to affect attitude and behaviour; however, social pressures and influences also have a significant effect. Little is known in regards to the social values, peer pressures and group interactions of the ORV user and it is likely that these factors play a role in the attitudes and behaviours that currently exist. Of particular importance is the way in which ORV users interact in the backcountry while on an ORV.

As mentioned above, persuasive communications are only one of many methods managers and resource councils can use to manage ORV use. Research focusing on a more multifaceted approach could prove to be effective and may allow managers to utilize a wider and more diverse range of management techniques. Research that works towards incorporating and integrating various management techniques that could be applied to specific ORV issues and concerns would also be worth exploring. A meta-analysis of ORV management strategies and techniques for various environmental concerns and their effectiveness and ease of implementation would be practicable and invaluable to resource managers, environmental organizations and regional resource councils.

## References

- Ajzen, I. (1992). Persuasive communication theory in social psychology: A historical perspective. In M.J. Manfredo (Ed.), *Influencing Human Behavior: Theory and Applications in Recreation, Tourism, and Natural Resources* (pp. 1-28). Champaign, IL: Sagamore Publishing.
- Albarracín, D., & McNatt, P. (2005). Maintenance and decay of past behavior influences: Anchoring attitudes on beliefs following inconsistent actions. *The Society for Personality and Social Psychology, 31*(6), 719-733.
- Baker, S.M., Petty, R.E., & Gleicher, F. (1991). Persuasion theory and drug abuse prevention. *Health Communication, 3*, 193-203.
- Bane, R. (2001). Shredded wildlands: All-terrain vehicle management in Alaska. Sierra Club and Alaska Conservation Foundation, Anchorage, Alaska: Sierra Club.
- Blahna, D., Bahr, R., & Fisher, A. (2001). Off highway vehicle uses and owner preferences in Utah. Report IORT PR2001-02. Logan, UT: Institute for Outdoor Recreation and Tourism, Department of Forest Resources, Division of Natural Resources, Utah State University.
- Borrie, W. T., & Harding, J. A. (2002). Effective recreation visitor communication strategies: Rock climbers in the Bitterroot Valley, Montana. Report RMRS-RN-15. Missoula, MT: USDA Forest Service, Rocky Mountain Research Station.
- Brehm, J., & Cohen, A. (1962). *Explorations in Cognitive Dissonance*. New York: Wiley.
- Bright, A., & Manfredo, M. (1992). The effects of cognitive complexity on the extremity of attitudes towards recreation and natural resource management issues.

[Abstract]. *Proceedings of the 4th North American Symposium on Society and Resource Management*, University of Wisconsin.

- Brooks-Harris, J.E., Heesacker, M., & Mejia-Millan, C. (1996). Changing men's male gender-role attitudes by applying the elaboration likelihood model of attitude change. *Sex Roles, 35*, 563-580.
- Burgess, R. L., Clark, R. N., & Hendee, J. C. (1971). An experimental analysis of antilittering procedures. *Journal of Applied Behavior Analysis, 4*, 71-75.
- Cialdini, R. B., Petty, R. E., & Cacioppo, J. T. (1981). Attitude and attitude change. *Annual Review of Psychology, 32*, 357-404.
- Chin, A., Rohrer, D., Marion, D., & Clingenpeel, J. (2000). Effects of all-terrain vehicles on stream dynamics. In J.M. Guldin (Ed.), *Ouachita and Ozark Mountains symposium: Ecosystem management research*. (pp. 292-296). Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station,
- Claypool, M., Mackie, M., Garcia-Marques, T., McIntosh, A., & Udal, A. (2004). The effects of personal relevance and repetition on persuasive processing. *Social Cognition, 22*(3), 310-335.
- Cole, D., Hammond, T., & McCool, S. (1997). Information quality and communication effectiveness: Low-impact messages on wilderness trailhead bulletin boards. *Leisure Sciences, 19*, 59-72.
- Cole, D. N., Petersen, M. E., & Lucas, R. C. (1987). Managing wilderness recreation use: Common problems and potential solutions. General Technical Report INT-230. Ogden, UT: USDA Forest Service, Intermountain Research Station.

- Colgrove, J. (1991). The power of persuasion: Diphtheria immunization, advertising, and the rise of health education. *Public Health Reports, 119*, 506-509.
- Crompton, J. L., & Seong-Seop, K. (2001). The effects of different types of information messages on perceptions of price and stated willingness-to-pay. *Journal of Leisure Research, 33*(3), 299-318.
- Doosje, B., & Siero, F. (1997). Attitude change following persuasive communication: Integrating Social Judgment Theory and the Elaboration Likelihood Model. *European Journal of Social Psychology, 23*, 541-554.
- Dorrance, M.J., Jakimchuck, R.D., & Carruthers, E.R. (1975). Effects of snowmobiles on white-tailed deer. *Journal of Wildlife Management, 39*(3), 563-569.
- Duncan, G.S., & Martin, S.R. (2002). Comparing the effectiveness of interpretive and sanctioned messages for influencing wilderness visitors' intended behavior. Peer reviewed. *International Journal of Wilderness, 8*(2), 20-25.
- Duthler, K., & Palmgreen, P. (2003, May). The influence of peripheral cues on the processing of persuasive messages on the World Wide Web. Conference Paper. International Communication Association, 2003 Annual Meeting, San Diego, CA, 1-35.
- Eagly, A. H., & Himmelfarb, S. (1974). Current trends in attitude theory and research. In S. Himmelfarb & A. H. Eagly (Eds.), *Readings in Attitude Change* (pp. 594-610). New York: Wiley.
- Ewert, A.W. (1999). Outdoor recreation and natural resource management: An uneasy alliance. *Parks and Recreation, 34*(7), 59-67.

- Farrell, T., Hall, T.E., & White, D.D. (2001). Wilderness campers' perception and evaluation of campsite impacts. *Journal of Leisure Research*, 33(3), 229-250.
- Fazio, J. (1979). Communicating with the wilderness user. Wildlife and Range Science Bulletin Number 28, Moscow, ID: University of Idaho College of Forestry.
- Festinger, L. (1950). Informal social communication. *Psychological Review*, 57, 271-282.
- Festinger, L. (1957). *A Theory of Cognitive Dissonance*. Stanford: Stanford University Press.
- Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.
- Freddy, D. J., Whitcomb B.M., & Fowler, M.C. (1986). Responses of mule deer to disturbance by persons afoot and snowmobiles. *Wildlife Society Bulletin*, 14 (1), 63-68.
- Fico, G., Lacy, S., & Riffe D. (1998). *Analyzing Media Messages: Using Quantitative Content Analysis in Research*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Government of Canada. (1993). Umbrella final agreement between the Government of Canada, the Council of Yukon Indians and the Government of the Yukon. Whitehorse, Yukon.
- Gramann, J., & Vander Stoep, G. (1987). Pro-social behavior theory and natural resource protection: A conceptual synthesis. *Journal of Environmental Management*. 24, 247-257.
- Happe, P.J., Shea, K.E., & Loya, W.M. (1998). Assessment of all-terrain vehicle (ATV) impacts within Wrangell-St. Elias National Park and Preserve, Alaska. (Report

- No. 98-1). Copper Center, AK: U.S. Department of the Interior, Wrangell-St. Elias National Park and Preserve.
- Hendee, J., Stankey, G., & Lucas, R. (1990). *Wilderness Management*. Golden, CO: Fulcrum Publishing.
- Henschel, C. (2003). The road less traveled? A report on the effectiveness of controlling motorized access in remote areas of Ontario. Toronto: Wildlands League and the Sierra Legal Defense Fund.
- Knowles, E.S., & Linn J.A. (2004). *Resistance and Persuasion*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Krippendorff, K. (1980). *Content Analysis: An Introduction to its Methodology*. Newbury Park, CA: Sage Publishing.
- Krueger, R., & Casey, M. (2000). *Focus Groups: Practical Guide for Applied Research*. (3rd Edition). Thousand Oaks, CA: Sage Publications.
- Lien, N. (2001). Elaboration Likelihood Model in consumer research: A review. *National Science Council, 11(4)*, 301-310.
- Lindlof, T.R., & Taylor, B.C. (2002). *Qualitative Communication Research Methods* (2<sup>nd</sup> ed.). Thousand Oaks, CA: Sage Publishing.
- Loeks, D. (2000). Off-road vehicle use and issues in the Yukon. Report 1. Whitehorse, Yukon: Yukon Fish and Wildlife Management Board.
- Loeks, D. (1997). Off-road vehicle use in the Yukon: Issues scoping study for Yukon Department of Renewable Resources. Whitehorse, Yukon: Yukon Department of Renewable Resources.

- MacLennan, P. (2000). Visitor information as a management tool: A review. (Report, 0114-2798). Wellington, New Zealand: Science Technology and information Services, Department of Conservation.
- Manfredo, J. Ed. (1992). *Influencing Human Behavior: Theory and Applications in Recreation, Tourism, and Natural Resources Management*. Champaign, IL: Sagamore Publishing.
- Manfredo, M. J., & Bright, A. D. (1991). A model for assessing the effects of communication on recreationists. *Journal of Leisure Research*, 23(1), 1-20.
- Manning, R.E. (2003). Emerging principles for using information/education in wilderness management. *International Journal of Wilderness*, 9(1), 20-28.
- Moscardo, G. (1999). *Making Visitors Mindful: Volume 2*. Champaign, IL: Sagamore Publishing.
- McLaren, M. A., & Green, J. E. (1985). The reactions of muskoxen to snowmobile harassment. *Arctic*, 38 (3), 188-193.
- McNeill, B. W., & Stoltenberg, C. D. (1988). A test of the elaboration likelihood model for therapy. *Cognitive Therapy & Research*, 12(1), 69-79.
- Negra, C., & Manning, R. (1997). Incorporating environmental behavior, ethics, and values into non-formal environmental education programs. *Journal of Environmental Education*, 28(2), 10-21.
- Nessier, U. (1976). *Cognition and Reality*. San Francisco: W. H. Freeman.
- Neuendorf, K. (2002). *The Content Analysis Guidebook*. Thousand Oaks, CA: Sage Publishing.

- Oliver, S. S., Roggenbuck, J., & Watson, A. (1985). Education to reduce impacts in forest campgrounds. *Journal of Forestry*, 83, 234-36.
- Petty, R.E., Baker, S., & Gleicher, F. (1991). Attitudes and drug abuse prevention: Implications of the Elaboration Likelihood Model of persuasion. In L. Donohew, H. E. Sypher & W. J. Bukoski (Eds.), *Persuasive Communication and Drug Abuse Prevention* (p. 71-90). Hillsdale, NJ: Erlbaum.
- Petty, R. E., & Cacioppo, J. T. (1996). *Attitudes and Persuasion: Classic and Contemporary Approaches*. Boulder, CO: Westview Press.
- Petty, R. E., & Cacioppo, J. T. (1986). *Communication and Persuasion: Central and Peripheral Routes to Attitude Change*. New York: Springer-Verlag.
- Petty, R. E., Cacioppo, J.T., & Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research*, 10, 135-146.
- Petty, R. E., & Krosnick, J. A. (1995). *Attitude Strength: Antecedents and Consequences*. Hillsdale, NJ: Erlbaum Associates.
- Petty, R. E., McMichael, S., & Brannon, L. A. (1992). The Elaboration Likelihood Model of persuasion: Applications in recreation and tourism. In M.J. Manfredi (Ed.), *Influencing Human Behavior: Theory and Applications in Recreation, Tourism, and Natural Resources* (pp. 77-101). Champaign, IL: Sagamore Publishing.
- Petty, R. E., Rucker, D.D., Bizer, G.Y., & Cacioppo, J.T, (2004). The Elaboration Likelihood Model of persuasion. In Seiter, J.S., & Gass, R.H. (Eds), *Perspectives on Persuasion, Social Influence and Compliance Gaining* (pp. 65-85). Toronto: Pearson Publishing.

- Powell, T. (2002). Effect of snowmobile activity on behaviour and range use of woodland caribou in the Yukon. Unpublished Masters thesis, Laval University, Quebec, Canada.
- Propst, D. B., Schomaker, J. H., & Mitchell, J. E. (1977). Attitudes of Idaho off-road vehicle users and managers. College of Forestry, Wildlife and Range Sciences, University of Idaho, 27, 1-38.
- Roberts, C.W. (1997). *Text Analysis for the Social Sciences: Methods for Drawing Statistical Inferences from Texts and Transcripts*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Roggenbuck, J. (1992). Use of persuasion to reduce resource impacts and visitor conflicts. In M.J. Manfredo (Ed.), *Influencing Human Behavior: Theory and Applications in Recreation, Tourism, and Natural Resources* (pp. 149-208). Champaign, IL: Sagamore Publishing.
- Schuett, M.A. (1998). Report of off highway vehicle users study. (Report 041). United States Forest Service, Pacific Southwest Research Station, Submitted to the National Off Highway Vehicle Council. Sheboygan, WI.
- Simpson, K. (1987). The effects of snowmobiling on winter range use by mountain caribou. Working report WR-25. British Columbia Ministry of Environment and Parks Wildlife Branch (pp. 1-14). Nelson, BC.
- Sinnott, R. (1990). Off-road vehicles and hunting in Alaska: A report to the Alaska Board of Game. Unpublished Report. Division of Wildlife Conservation, Alaska Department of Fish and Game.

- Smith, C. P. (1992). *Motivation and Personality: Handbook of Thematic Content Analysis*. New York: Cambridge University Press.
- Stemler, S. (2001). *An overview of content analysis: Practical assessment, research and evaluation*. Retrieved August 30, 2006 from <http://PAREonline.net/getvn.asp?v=7&n=17>.
- Stewart, D. W., & Shamdasani, P.N. (1990). *Focus Groups: Theory and Practice*. London: Sage Publishing.
- Stiff, J. B., & Boster, F. J. (1987). Cognitive processing: Additional thoughts and a reply to Petty, Kasmer, Haugtvedt, and Cacioppo. *Communication Monographs*, 54, 250–256.
- Stokowski, P.A., & LaPointe, C.B. (2000). Environmental and social effects of ATVs and ORVs: An annotated bibliography and research assessment. Burlington: School of Natural Resources, University of Vermont..
- Tarrant, M.A., Overdeest, C.O., Bright, A.D., Cordell, H.K., & English, D.B.K. (1997). The effect of persuasive communication strategies on rural resident attitudes toward ecosystem management. *Society and Natural Resources*, 10(6), 537-550.
- Tyler, N.C. (1991). Short-term behavioural responses of Svalbard reindeer *Rangifer tarandus platyrhynchus* to direct provocation by a snowmobile. *Biology Conservation*, 56, 179-194.
- Vaske, J.J., Donnelly, M.P., & Deblinger, R.D. (1990). Activation and the acceptance of behavioral restrictions among over sand vehicle users. In More, T. A., Donnelly, M. P., Graefe, A. R., & Vaske, J. J. (Eds.). *Proceedings of the Northeastern*

- Recreation Research Symposium*. (pp.153-159). New York: USDA Forest Service General Saratoga Springs.
- Weber, R. P. (1990). *Basic Content Analysis*. Newbury Park, CA: Sage Publications.
- White, C. (2000). Report on ORV management strategies, activities, successes and failures in other jurisdictions. Unpublished Report. Access Management Working Group, Yukon Fish and Wildlife Management Board. Whitehorse, YT.
- Wirsching, A., Leung, Y. F., & Attarian, A. (2003). Swatting little bugs: What agencies can do to decrease depreciative visitor behavior. *Parks and Recreation*, 38(11), 16-22.
- Wood, W. (2000). Attitude change: Persuasion and social influence. *Annual Review of Psychology*, 51, 539-570.
- Yukon Fish and Wildlife Management Board. (2003). What we heard: Final report of the working group on off-road vehicles. Unpublished report. Whitehorse: Yukon Fish and Wildlife Management Board.

## Appendices

## Appendix A

## Overall Themes for Message Content

Subcategories based on the ELM	Emergent themes from content analysis
<b>Motivation to Process (1)</b>	
Personal Relevance	<p>A- 1.15A Desire for extensive access to public land Concern about restricting backcountry access</p> <p>B - 1.15A Small number of ORVers little impact.</p> <p>C - 1.12A Concerns are from special interest groups like outfitters and skiers. No restriction for the benefit of another group.</p> <p>D - 1.10A Desire for regional based initiatives</p>
Need for Cognition	<p>E - 1.42B Fairness in whatever approach is taken (Non motorized sheep hunters, First Nation vs non First Nation.</p> <p>F - 2.12B Reduction in instances and severity of impacts should be limited with education.</p>
Personal Responsibility	<p>G - 1.35C Its not us its them Problems are because of a few bad apples. Its not hunters its recreational riders Impacts are the responsibility of all wilderness users not just ORVs.</p>
<b>Ability to Process (2)</b>	
Prior Knowledge	<p>H - 2.19C Benefits of ORV use include disability and elder access, work, hunting, creates trails for other users, watch over outfitting actions, local economy, heritage.</p> <p>I - 2.12C ORVs do not impact the environment</p>

	<p>Crossings don't harm fish  Don't harm wildlife  Proper ORV use doesn't effect environment  ORV impacts are temporary.  Negligible and insignificant cosmetic damage only</p>
<b>Public concerns</b>	<p>J - 2.105C  Displacement and stress of wildlife</p> <p>2.38C  Damage to waterways, fish and fish habitat, bird habitat and shores</p> <p>2.32C  Widening and spreading of trail networks</p>

## Appendix B

## Background letter for the participation in a research focus group

Dear xxxxx,

RE: Letter of invitation.

I would like to give you some background information regarding this research project that I am conducting. This research project is part of the requirement for a Masters in Environmental Education and Communications at Royal Roads University in Victoria, British Columbia. My credentials with Royal Roads University can be established by telephoning Dr. Rick Kool, Director of the Masters of Environmental Education and Communications (MEEC) program at (250) 391-2523 or by e-mail at [rick.kool@royalroads.ca](mailto:rick.kool@royalroads.ca).

The research will require you to participate in one focus group that will last between 1 or 2 hours. The foreseen questions for the focus group will refer to determining the effectiveness of specific messaging and communications for the purpose of promoting low-impact behaviour in the backcountry. Information will be recorded by tape recorder and transcribed into written form and, where appropriate, summarized in anonymous format, in the body of the final report. *At no time will any specific comments be attributed to any individual unless specific agreement has been obtained beforehand.* All documentation used will be kept strictly confidential.

Upon completion, the research report will be available through the University of Royal Roads. I will also be sharing my research findings with the Yukon Fish and Wildlife Management Board who will be using the outcomes of my report to inform their strategic communications objectives.

You are not compelled to take part in this research project. If you do elect to take part, you are free to withdraw at any time with no prejudice. Similarly if you choose not to take part in this research project, this information will also be maintained in confidence.

If you would like to participate in my research project, please contact me at the numbers below.

Sincerely,

Rob Yeomans  
PH 867 393-2739  
Email: [rob.yeo@gmail.com](mailto:rob.yeo@gmail.com)

## Appendix C

## Research Consent Form

This research project is part of the requirement for a Masters in Environmental Education and Communications at Royal Roads University in Victoria, British Columbia.

The learner concerned is Rob Yeomans. Mr. Yeomans credentials with Royal Roads University can be established by telephoning Dr. Rick Kool, Director of the Masters of Environmental Education and Communications (MEEC) program at (250) 391-2523 or by e-mail at [rick.kool@royalroads.ca](mailto:rick.kool@royalroads.ca).

This document constitutes an agreement to take part in a research program, the objective of which is to utilize relevant information from the content of selected Yukon Fish and Wildlife Management Board public ORV questionnaires that may be applicable to the formation of effective communication messaging. The purpose of which is to promote low-impact ORV practices.

The research will consist of two focus groups that will last between 1 or 2 hours. The foreseen questions will refer to the effectiveness of specific messaging and communications for the purpose of promoting low-impact behaviour in the backcountry.

Information will be recorded by tape recorder and, where appropriate, summarized in an anonymous format in the body of the final report. *At no time will any specific comments be attributed to any individual unless specific agreement has been obtained beforehand.*

A copy of the final report will be housed at Royal Roads University and will be publicly accessible.

Prospective research participants are not compelled to take part in this research project. If an individual does elect to take part, she or he is free to withdraw at any time with no prejudice. Similarly if employees or other individuals elect not to take part in this research project, this information will also be maintained in confidence.

By signing this letter, the individual gives free and informed consent to participating in this project.

Name: (Please Print): \_\_\_\_\_

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

## Appendix D

## Guiding questions used by focus group facilitator

1. Does this message make you feel as though there may be some sort of consequence involved with not riding responsibly in the wilderness?

If so.. What might that consequence(s) be?

2. Does the content in this message seem personally relevant to you?

If so... in what way?

3. Does the information in this message contradict any knowledge you have regarding riding an off-road vehicle in the wilderness?

If so what information seems contradicting?

4. Is the information presented in this message consistent with your current attitude towards the use of off-road vehicles? How?

5. After hearing and reading this message do you feel a sense of responsibility:

...to maintain the natural state of the wilderness?

...towards the use of your ORV in the wilderness?

...towards other trail users?

6. Does this message use any words or phrases that you don't fully understand?

If yes... what word or phrase?

7. Do you feel that this message speaks favorably towards the use of off-road vehicles? Why?

8. Does the message make any assumptions that you don't agree with?

Please explain:

9. Does the message motivate you to ride your off-road vehicle with care and consideration of the natural world?

Please explain:

10. Does the message motivate you to:

...move slow through streams?

...keep your distance from wildlife?

...stay on existing trails?