The Effect of Ambivalence on On-Leash Dog Walking Compliance Behavior in Parks and Protected Areas

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EXECUTIVE SUMMARY: This study employed the theory of planned behavior (TPB) to examine how ambivalence affects compliance of visitors to regulation concerning on-leash dog requirement in a national park setting. Pacific Rim National Park Reserve in British Columbia, Canada, has a substantial challenge with off-leash dogs, which interfere with shorebirds and contribute to habituation of wolves that come to view dogs as prey. Historically, the park has favored indirect visitor education strategies over direct enforcement. These visitor education strategies rely upon frequency and intensity of information, conservation appeal for keeping wolves unhabituated and "wild," respecting sensitive shorebird habitat, and fear, by presenting dogs as prey. However, the ineffectiveness of current strategies and ongoing visitor noncompliance with dog-leashing regulations has presented a significant challenge, highlighting the importance of theory in developing effective strategies to influence visitor behavior. Following TPB methodology, interviews were conducted with compliers (dogs on-leash) and noncompliers (dogs off-leash) from which a survey was developed. Results found a strong relationship between behavior, intentions, and the three factors that influence intentions: attitudes, subjective norms, and perceived behavioral control. However, relations were weaker between each of these factors and the relevant beliefs thought to be influencing each factor. The next phase of analysis examined ambivalence, which occurs when visitors hold conflicting attitudinal beliefs about a desired behavior. In this ambivalence situation, park visitors may choose not to reflect on beliefs when forming their attitudes about complying with on-leash regulations. Park regulations and communications usually target attitudinal beliefs in order to influence visitor behavior, but under conditions of ambivalence, this kind of strategy may not be effective. In an ambivalence situation, messages to achieve compliance should be directed at influencing norms and perceived control, rather than just attempting to influence attitudes. In addition to messaging, alternative strategies to influence visitor behavior may be warranted that emphasize community level outreach initiatives focused on personal contact. Patrolling and on-leash enforcement in combination with outreach may be more effective. Seasonal closures to sensitive areas during peak migration may also make enforcement a less daunting task of managing visitors in such a large area. Providing an alternative beach area or other location where

dogs can run free may also make it easier for park visitors with dogs to engage in compliance behavior. Media, social media, "prompts" that remind people to "leash up," and messages delivered by a credible source also have the potential to influence on-leash behavior.

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Parks and protected area managers are often challenged when visitors create negative impacts such as littering, defacing facilities, or inappropriate behavior around wildlife. Instituting laws, regulations, and their enforcement can be very effective but can be costly and difficult to maintain. Alternatively, visitor education strategies are thought to be appropriate in leisure settings such as national parks for managing visitor behavior. However, simply providing information is rarely successful in persuading people to engage in a desired behavior (Mackenzie-Mohr, 2011) regardless of intensity and frequency of delivery (Hughes & Morrison-Saunders, 2005). The result can be noncompliance with park regulations, leading to possible compromises of conservation objectives, visitor experience objectives, or both. In this paper, the issue of noncompliance is addressed through research undertaken using TPB. Attention to theory can help to explain why a particular approach to managing visitor behavior is successful or not. Associated research can then inform education and information strategies more effectively to reduce undesirable visitor behavior. In parks and protected areas, TPB (Fishbein & Ajzen, 2010) is one of the most influential and widely applied models used to inform the development of persuasive communication to influence visitor behavior.

One example of noncompliance behavior in many parks is the management of dogs, particularly when off-leash. Off-leash dogs can disturb sensitive wildlife habitat for shorebirds (Esrom, 2004; Meager, 2012; Zharikov, 2011), come into conflict with people, and have the potential to habituate wolves to dogs as easy prey, placing humans at potential risk (Kojola & Kuittinen, 2002; Linnell et al., 2002). This paper elaborates on a study exploring how the TPB can be applied to understand lack of visitor compliance related to on-leash regulations in a protected area despite a considerable information campaign (Bowes, 2015). Specifically, this paper explores the role of ambivalence as a possible factor influencing the relationship between behavioral beliefs and attitudes, possibly contributing to non-compliance behavior. The literature indicates that high levels of ambivalence are associated with low engagement in conservation behavior, such as recycling (Castro, Garrison, Rei, & Menesez, 2009) and pro-environmental intentions (Costarelli & Collorca, 2004).

The Theory of Planned Behavior

The TPB suggests that attitudes, subjective norms, and perceived behavioral control (PBC) influence intention to act in a particular way (see Figure 1.) The TPB has been applied to a variety of national park management issues such as feeding birds (Ballantyne

& Hughes, 2006), staying on designated trails (Beeton, Weiler, & Ham, 2005; Bradford & McIntyre, 2007), proper food storage (Lackey & Ham, 2003), littering (Brown, Ham, & Hughes, 2010), and discouraging off-leash dogs (Hughes, Ham, & Brown, 2009). According to the model, behavior is driven by our intention to behave in a particular way. These intentions are influenced by attitudes (favorable or unfavorable evaluations of behavior), subjective norms (social pressure to perform the behavior), and PBC (the ease or difficulty of performing the behavior). When attitudes and subjective norms toward behavior are favourable, combined with a sufficient amount of PBC, intention to perform the behavior is the strongest.
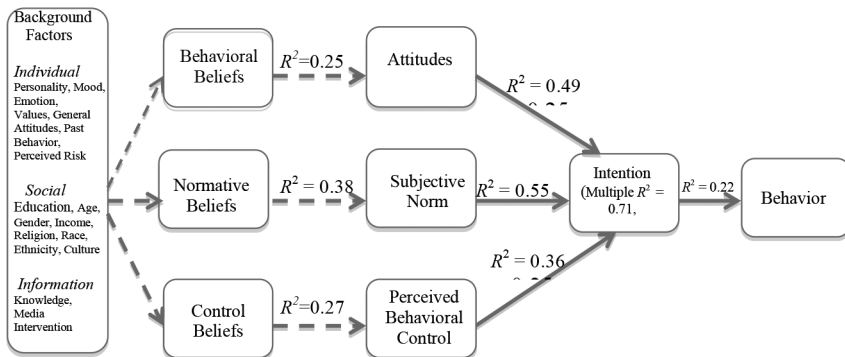

Figure 1. The Theory of Planned Behavior (adapted from Fishbein & Ajzen, 2010) as Applied to Dog-Leashing in Pacific Rim National Park.

An understanding of the beliefs that underlie attitudes, subjective norms, and perceived behavioral control can aid intervention strategies that encourage visitors to behave appropriately in a given situation. Attitudes are shaped by relevant beliefs, such as leashing a dog will allow the owner to better manage his or her pet's behavior. A negative behavioral belief is the loss of freedom and the ability for a dog, "just to be a dog."

Normative beliefs consist of what other important people, like other dog walkers, family members, friends, or park management think about them having their dog on, or off-leash, and the motivation to comply with this social pressure. Control beliefs are the factors that facilitate or inhibit the desired behavior. Control beliefs consider what things make it easy or difficult to comply and the strength of that evaluation. Having the physical ability to hold onto a leashed dog, for example, may make it "easier" to leash a pet, and therefore perhaps may make it more likely for the individual to do so.

In the parks literature, TPB has been effective in identifying variables that can 'potentially' influence visitor behavior (Beeton, Weiler, & Ham, 2005). Although TPB strategies have been generally successful, there still remains much to be learned about the TPB and influencing people's actions (Brown, Ham, & Hughes, 2010), and ambivalence is one line of enquiry.

Ambivalence

Ambivalence is the simultaneous existence of positive and negative evaluations of an attitude object (Conner & Sparks, 2002; Maio, Bell, & Esses, 1996; Sparks et al., 2001). Ambivalence is often linked with a reduced inclination to act (Conner, Povey, Sparks, James, & Shepherd, 2003). In TPB studies, high levels of ambivalence are associated with low engagement in conservation behavior. For example, ambivalence moderates the relationship between attitudes and intention as predictor variables with recycling (Barata & Castro, 2013; Castro, Garrison, Rei, & Menesez, 2009) and pro-environmental intentions (Costarelli & Collorca, 2004).

In the context of the present study, ambivalence occurs when a respondent holds conflicting behavioral beliefs about leashing their dog. For example, a positive behavioral belief is "I have more control over my dog if I keep it on-leash." A negative behavioral belief is "My dog loses the freedom to run around, play and just be a dog if I keep my pet on-leash." When people feel these two conflicting beliefs, they may reject or fail to access the behavioral beliefs when forming attitudes, and so the correlation between attitudes and belief may be weakened under the condition of high ambivalence. Low ambivalence occurs if conflicting beliefs exist, but these beliefs are felt "unlikely to occur." With low ambivalence, the person may more easily access this belief information, and the corresponding correlation between attitudes and beliefs is stronger. If low ambivalence is experienced, the person can more easily overcome the conflict and therefore are likely to still exhibit with the desired behavior.

Study Context

Pacific Rim National Park Reserve, located on the west coast of Vancouver Island, is one of Canada's most visited National Park destinations (see Figure 2). Easily accessed beaches in the park are popular for a variety of activities, including dog walking. However, when visitors chose not to comply with park regulations to leash their dogs the results are loss of critical foraging habitat for migratory shorebirds and habituation of wolves. Signs and a high frequency and intensity of delivery have been the preferred management approach, however its lack of effectiveness indicates the need for an alternative strategy.
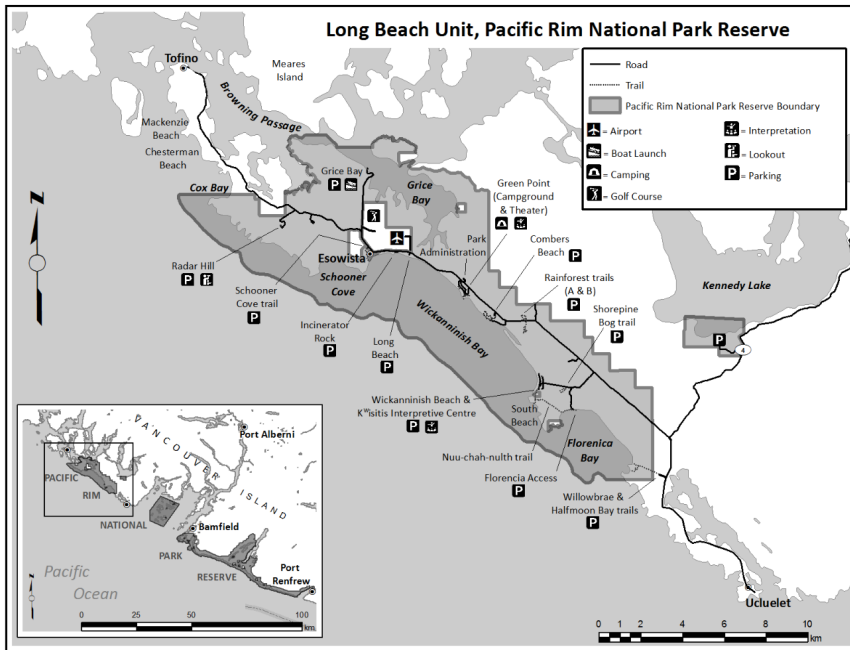

Figure 2. The Long Beach Unit of Pacific Rim National Park Reserve (Parks Canada, 2014).

This paper uses the TPB to examine noncompliance behavior regarding leashing regulations in the park. The central research question asks "How does ambivalence influence decision-making behavior and provide insight into the cognitive foundation of the behavior?" It was predicted that park visitors with a higher degree of ambivalence, (1) their attitudes will be less likely to be shaped by behavioral beliefs, and (2) their attitudes

are less likely to influence their intentions and behavior. Dog walkers with a lower degree of ambivalence are more able to access beliefs to shape their attitudes and, under these conditions, attitudes will be more strongly correlated with intention and behavior.

Method

Two phases of research consisted of semi-structured interviews to elicit dog walkers' salient beliefs and a survey to measure beliefs, attitudes, subjective norms, perceived behavioral control and intention.

Phase 1 took place in June 2013, when semi-structured interviews ($n = 42$) based on the TPB (Fishbein & Ajzen, 2010) were conducted with a convenience sample of compliers (people walking their dogs on-leash) ($n = 21$) and noncompliers (people allowing their dogs to run free off-leash) ($n = 21$) in the park, until saturation of responses was reached.

Beliefs were identified with a content analysis of the interview responses. In lieu of a large research team, internal validity was assessed as face validity (Weber, 1990) by the Human Dimensions of Wildlife Specialist at the Province of British Columbia. A pool of salient beliefs was then used to inform the creation of a questionnaire that identified the most prevalent and frequent beliefs, attitudes, subjective norms, and PBC.

In Phase 2, a questionnaire was developed according to procedures outlined in TPB, using the belief elicitation data from Phase 1 to inform the specifics for measuring each element of the model: intentions, attitudes, subjective norms, perceived behavioral control, and beliefs (see Bowes et al., 2015). An initial fixed-item questionnaire was pilot tested ($n = 20$) on the beach in June 2013 with a sample of compliers ($n = 10$) and noncompliers ($n = 10$) to discover any problems with wording and formatting. Following refinement of the instrument, the main study was then conducted with random samples of compliers ($n = 162$) and noncompliers ($n = 140$) after they were first observed unobtrusively in the park. Sampling was implemented on randomly selected days between July 1 and September 30, 2013. On each day, the first interview was conducted with a complier and the next was conducted with a non-complier, with this pattern repeating throughout the day. Out of the total number of visitors contacted ($n = 322$), the response rate was 94% ($n = 302$).

Results

Belief Measurement

Measurement of behavioral beliefs is divided into two parts (Table 1). Behavioral belief strength is measured by a rating of the likelihood that an outcome will occur if the respondent engages in the target behavior (leashing their pet), using a 7-point scale from 1= *extremely unlikely* to 7 = *extremely likely*. This is followed by an evaluation measure whether this outcome is good or bad, measured on a 7-point scale from -3 = very bad to +3 = very good.

Behavioral Belief Cross-Products

The impact of behavioral beliefs on attitudes is determined by multiplying each belief strength score by its respective evaluation score. This "cross-product" reveals the strength of the belief in relation to the target behavior. For example, a person is more likely to carry out behavior with a higher and more positive cross-product score. The overall impact of all behavioral beliefs (indirect attitudes) is computed by summing cross products of belief strength and evaluation for each respondent.

Table 1

Behavioral Belief Cross Products (Indirect Measure of Attitudes) Regarding Leashing a Dog in a Park

Behavioral Belief	Belief Strength (1 to 7)	Evaluation (-3 to +3)	Cross Product (-21 to +21)
My dog will be safer from wolves	3.90	2.40	+9.30
It will be safer for other people	3.21	2.40	+7.70
My dog loses freedom to run and play	5.22	-1.73	-9.03
More control over my dog	4.70	2.24	+10.50
My dog will attract wolves to me	2.02	-2.30	-4.80
My dog will bother other people	2.09	-2.22	-4.63
My dog will run through flocks of shorebirds	2.07	-1.91	-3.95
My dog will behave aggressively toward other dogs	2.16	-2.6	-5.61
My dog pulls me around and it is hard to keep up to it	2.80	-2.13	-5.96

Testing the Theory of Planned Behavior

Relationships predicted by the TPB are illustrated in Figure 1. Reliability, as measured with Cronbach Alpha was high (Vaske, 2010) for intention: (.819), attitude (.864), subjective norm (.612), but somewhat lower for perceived behavioral control (.493). The TPB postulates that intentions are influenced by attitudes, subjective norms and perceived behavioral control, as indicated by the arrows in Figure 2.

The impact of each of these factors on intentions is moderate to strong: attitudes ($R^2 = 0.49$), subjective norms ($R^2 = 0.55$) and perceived behavioral control (PBC), ($R^2 = 0.36$). A multiple regression ($R^2 = 0.71$) illustrated that attitudes, subjective norms and PBC have the ability to predict 71% of the variability in intention. However, the correlation between intention and observed behavior was less strong ($R^2 = 0.22$). In the linear regressions of belief measures, all correlations are less strong: attitudes and behavioral beliefs ($R^2 = 0.25$); subjective norms and normative beliefs ($R^2 = 0.38$); and perceived behavioral control and control beliefs ($R^2 = 0.27$). The relationship between attitude and behavioral beliefs is elaborated in the following discussion of ambivalence.

Ambivalence. The sample was subdivided into a low-ambivalence group and a high-ambivalence group by selecting two behavioral beliefs that were "conflicted," in the sense that one was a "positive" outcome while the other was a "negative" outcome. Examination of the cross-products in Table 1 reveals that two beliefs appear to create conflict. The most positive belief cross product is "I have more control over my dog" (*mean* = +10.9), and the most negative belief cross product is "My dog loses the freedom to run, play" (*mean* = -9.03). Dog walkers who rated both of these conflicting outcomes as highly likely (scores of 6 or 7 on the 7-point Likert scale) were assigned to the high-ambivalence ($n = 237$) groups. Subjects who rated these two outcomes as 5 or lower on the scale were assigned to the low-ambivalence group ($n = 64$).

In contrast to computations used in TPB, there is less consensus on how to measure ambivalence (Breckler, 1994; Priester & Petty, 1996). Ambivalence has been measured through a calculation involving all positive behavioral beliefs and all the negative behavioral beliefs (see Conner et al., 2002). However, in this research, we have explored a technique involving the two most extreme conflicting beliefs, departing from the convention of using all beliefs. This reasoning appears appropriate given the pattern of cross-products described in Table 1, where it is observed that two contrasting beliefs appear to contribute to ambivalence more than other beliefs.

There is a significant relationship between ambivalence and compliance, with 98.4% of low ambivalence complying, compared to 38.4% of the high ambivalence group (chi squared = 72.3; $p = 0.000$). The strength of this relationship is strong (Vaske, 2008), as measured by Phi (0.491).

Table 2

The Relations Between Direct Measures of Attitudes and Indirect Measures of Attitudes for the Low and High-Ambivalence Groups

Group	R	R²	Sig.
Low-Ambivalence	0.55	0.30	<0.001
High-Ambivalence	0.32	0.10	0.011
Total Sample	0.50	0.25	<0.001
Fisher r_z			0.046

Table 2 illustrates that the low-ambivalence group demonstrated a stronger correlation ($R^2 = 0.30$) than the high-ambivalence group ($R^2 = 0.10$) in relationships between behavioral beliefs and attitudes. The Fisher r_z transformation (Kenny, 1987), which assesses the significance of the difference between these two correlations, was significant ($p = 0.046$).

Table 3 compares high- and low-ambivalence groups in terms of how intentions are predicted by attitudes, subjective norms and PBC. As indicated by the Fisher r_z values, the low-ambivalence groups had stronger correlations than high-ambivalence groups for attitudes and PBC correlations, but not for subjective norms.

Table 3

Linear Regression Between Intention and Three Predictors by High-Ambivalence and Low-Ambivalence Groups

	Group	R	R²	Sig.
Attitudes vs. Intention	Low-Ambivalence	0.73	0.53	<0.001
	High-Ambivalence	0.51	0.26	<0.001
	Overall	0.70	0.50	<0.001
Fisher r_z				0.010
Subjective Norm vs. Intention	Low-Ambivalence	0.69	0.47	<0.001
	High-Ambivalence	0.75	0.56	<0.001
	Overall	0.74	0.55	<0.001
Fisher r_z				0.384
Perceived Behavioral Control vs. Intention	Low-Ambivalence	0.66	0.40	0.003
	High-Ambivalence	0.38	0.14	0.003
	Overall	0.39	0.3	<0.001
Fisher r_z				0.006

The impact of intentions on observed behavior for low-and high-ambivalence groups is compared in Table 4. The correlation of intention with behavior for the low ambivalence group was 0.23, compared to the correlation between intention and behavior for the high-ambivalence group ($R^2 = .14$), but there was no significant difference between these two correlations, as determined by the Fisher rz transformation ($p = 0.347$).

In Table 5, multiple regression is used to measure the unique influence on intention by each independent variable: attitude, subjective norm, and perceived behavioral control, as indicated by the beta values. For the low-ambivalence group, the beta values are strongest for subjective norms (*beta* = 0.58), followed by attitudes (*beta* = 0.29) and PBC (*beta* = 0.15). Findings for the high-ambivalence group are somewhat different, with the strongest value occurring with the subjective norms (*beta* = 0.53), followed by PBC (beta = 0.19), with the beta value for attitudes not being significant (*sig* = 0.09). The Fisher r_z transformation result was significant ($p = 0.001$), indicating that intention can be more strongly predicted among the low-ambivalence dog walkers (multiple $R^2 = 0.77$) than can the high-ambivalence dog walkers (multiple $R^2 = 0.48$).

Table 4

Linear Regression of Intentions on Behavior for Low-Ambivalence and High-Ambivalence Groups

	R	R^2	Sig.
Low-ambivalence	0. 48	0. 23	0.001
High-ambivalence	0. 37	0. 14	0.001
Overall	0.47	0.22	<0.001
Fisher r_z			0.347

Table 5

Multiple Regression Predicting Intention from Attitudes, Subjective Norms, and Perceived Behavioral Control: Comparing Low-Ambivalence with High-Ambivalence Groups

Group	Multiple R	R^2	Sig.	Predictor Variables					
				Att.		SN		PBC	
				B	Sig.	B	Sig.	B	Sig.
Low-ambivalence	0.88	0.77	<0.001	0.29	<0.001	0.58	<0.001	0.15	<0.001
High-ambivalence	0.69	0.48	<0.001	0.19	0.090	0.53	<0.001	0.19	0.053
Overall	0.86	0.73	<0.001	0.29	<0.001	0.56	<0.001	0.16	<0.001
Fisher r_z			<0.001						

The findings from Table 5 (multiple regression) compare with findings from Table 3 (linear regression), in that the influence on intentions is stronger for low-ambivalence groups in both analyses, and the influence of subjective norms on intention is high in both analyses. Where the two analyses differ is that multiple regression findings indicate a stronger influence of subjective norms compared to attitudes or PBC.

Discussion

Developing effective indirect strategies aimed at influencing visitor behavior is challenging. Providing information is usually not effective (Mackenzie-Mohr, 2011) unless this information is linked somehow to the decision-making process that park visitors employ when deciding whether or not to comply with park regulations (Ham et al., 2009).

For example, in 2003, "Dogs On-Leash" signs were installed at all beach access points in the park, combined with preventative education/information strategies. However, strategies guided by "intuition" and "hunches" are rarely successful, regardless of the frequency and intensity of the message (Hughes & Morrison-Saunders, 2005). Wolf advisories posted on park information bulletin boards intend to educate, but do not "captivate" (Knudson, Cable, & Beck, 2003), however critical the information. To highlight this point, Esrom (2004) found that 39% of dog owners kept their pets leashed. However, eight years later, this had not changed (Zharikov, 2011), regardless of extensive efforts. In March 2017, the issue is still prevalent with a recent wolf attack on an off-leash dog on a beach adjacent to the park and an unprecedented attack of an on-leash dog on a popular park beach two days later (Parks Canada, personal communication, March 23, 24, & 28, 2017; Pacific Rim National Park, 2017).

Models such as the theory of planned behavior (TPB) (Fishbein & Ajzen, 2010) offer potential to help gain insights to develop effective strategies to promote compliance behavior and discover "what works and why," by focusing on the underlying beliefs that form people's attitudes, intentions, and subsequent behavior. However, park managers are

not often trained in social science or up to date with recent advances in communication theory.

This application of the TPB to off-leash dog walkers demonstrates that low-ambivalence groups had stronger correlations than high-ambivalence groups for attitudes and PBC correlations, but not for subjective norms. In general, intention can be more strongly predicted among the low-ambivalence dog walkers than among high-ambivalence dog walkers. When combined, these three elements of the theory are strong predictors of intention. However, correlations between the indirect measures of beliefs and direct measures, and between intention and behavior were weak. The results from this paper suggest that ambivalence plays an influential role in this model, influencing the way that intentions and behaviors are predicted from attitudes, subjective norms and perceived behavioral control.

As predicted, dog walkers with higher levels of ambivalence possess more internal conflict likely to have impact on attitudes. Those with a lower degree of ambivalence are more able to access beliefs to shape attitudes, as illustrated by stronger correlations between behavioral beliefs and attitudes. That is, for dog walkers with less conflict between their positive and negative evaluations of an attitudes object, such as using a leash, the relations to their attitudes will be stronger.

The prediction of intentions was also influenced by ambivalence. The lower ambivalence group had a stronger correlation between attitude and intention and between perceived behavioral control and intention. However, the low-ambivalence group had a stronger correlation between subjective norms and intention. This is not surprising given the strong correlation between subjective norms and intention in the TPB model, in comparison to attitudes and perceived behavioral control.

Finally, predicting observed behavior from intentions was weaker than other relationships. This finding is similar to many other studies using TPB. Further, this relationship was not influenced by ambivalence.

These findings are congruent with studies that consider ambivalence as an element of attitudes strength in which lower ambivalence is associated with stronger attitudes and more likely to guide behavior (Krosknick & Petty, 2014). A particularly salient facet of attitudes strength is how it influences information processing (Krosnik & Petty, 2014). Because attitudes that are ambivalent are less accessible, they are less likely to guide how particular information is processed (Jonas, Bromer, & Diehl, 2000).

Application of the TPB provides a number of possible communication strategies that have the potential to influence underlying beliefs, and subsequent behavior. These include (1) attempts to influence underlying behavioral beliefs (e.g., dog's on-leash will mitigate shorebird disturbance); (2) attempts to influence underlying normative beliefs (e.g., families with small children would prefer dogs to be leashed) and; (3) attempts to influence control beliefs (e.g. having the right equipment handy, like a retractable leash, would make it easier to keep dogs on-leash).

The first strategy, focusing on behavioral beliefs, may be effective on high-ambivalence visitors if communication strategies focus on trying to reduce the perceived likelihood of undesired outcomes occurring. In this situation, the outcome value (evaluation of "good" or "bad") is difficult to change, although the likelihood dimensions may be responsive to persuasive communication. Findings suggest that the first and third strategy would be more effective for low-ambivalence visitors, whereas the second strategy may be more effective for high-ambivalence visitors. Normative appeals target what "important others" think they should do (i.e., leashing up). Important others may include, family, friends, or a park ranger. Using the above example of 'families with small children,' a message targeting that particular normative influence may look like: "Your dog loves the beach, but so do small children! Please keep kids from being accidentally knocked over by leashing your pet."

This study does however point to some limitations that can occur with the TPB when the intent is to design strategies to influence behavior. The weak relationships between the indirect and direct measures of attitudes in the TPB influenced by ambivalence suggest that an overall strategy that incorporates an assortment of different techniques to influence

visitor behavior may be warranted. For example, the importance of personal contact over signs, pamphlets and brochures is well established in the parks literature (e.g., Hughes & Morrison-Saunders, 2005). Community level initiatives focused on personal contact (Mackenzie-Mohr, 2011) and outreach with local communities can be fundamental to successful education programs in national parks (Knapp & Benton, 2004). Most visitors to Pacific Rim National Park Reserve with dogs are from neighboring communities of Tofino and Ucluelet as well as the nearby cities of Vancouver, Victoria, and Nanaimo. These are all citizens of the Province of British Columbia and represent a target population for an opportunity for focused outreach and education.

A television interview (Pacific Rim National Park, 2017) with the Nanaimo resident whose off-leash dog was attacked by a wolf in March 2017 on a beach adjacent to the park, described above, provides the potential to harness the efficacy of outreach and personal contact via media, especially with this group. The dog owner reported a new respect for the region and will exercise more caution next time. Her hope is that by sharing her experience it will mitigate similar encounters. Messages delivered by a credible source, such as the Nanaimo resident, are also very effective (Knudson, Cable, & Beck, 2003) and can be used as a powerful appeal to help keep dogs on-leash. Combined with a television interview with Park Conservation Management on the escalation of the issue ("Pacific Rim National Park" 2017), described above, it may help to provide a way forward.

Social media has a role in influencing visitor behavior. For example, "prompts" that remind people to behave in a particular way can also be very effective. According to Wang, Park, and Fesenmaier (2012) smartphones can influence tourists' behavior and emotional states by providing a wide variety of information needs, and the ability to share experiences and information. Twitter, Snapchat, Facebook, email, and texting provide an opportunity to remind dog owners to leash up by sharing this information. A park app would be a useful tool that can easily be shared to deliver messaging reminding visitors about dogs, leashes, and wolves. For example, the study site is a front country park, with cell phone access in many places. Further, Parks Canada now provides Wi-Fi in campgrounds and other key park areas.

Websites also represent a fertile field for innovative communication strategies in their increasing importance for trip planning, interpretation and reflection (Tsai, Chou, & Lai, 2010). The park currently uses its website to post important bulletins, such as wolf advisories, under "Public Safety." Further information on how to live with wildlife, keep the wild in wildlife, and keep carnivores wild and wary are posted under "Visitor Safety."

However, simple low-tech "prompts" can also be effective. In the park, "messy" campsites at Green Point Campground are given a warning card left on picnic tables in order to mitigate conflict with black bears. Consequently, the park's Bear Aware program has been very successful. In another very salient and effective example, at Acadia National Park in Maine, USA, volunteers and staff hand out yellow information cards printed by the American Kennel Association (AKA) that listed reasons why it is important for dogs to be kept on-leash. Because they were folded and small, they ended up in people's pockets and very few cards were found discarded (manuscript peer reviewer, personal communication, March 2017).

Gateway communities to the park such as Tofino and Ucluelet can also help to foster environmental stewardship among local residents. Local communities can help to promote park values, conservation messages, and be supportive of park communication programs (Knapp & Benton, 2004), as well as of course setting examples through their own compliance with on-leash regulation. However, communities located near to Canada's national and provincial parks have lacked collaboration and integration in these efforts (Hvenegaard, Shultis, & Butler, 2009). A study of Vancouver Island tourism found that park management and local business communities did not view each other as partners (Vaugois, Rollins & McDonald, 2007). However, organizations offering tours in the park are issued information updates via email (e.g., Parks Canada, personal communication, March 23 & 24, 2017) and the role of the tour guide should not be underestimated (Hvenegaard & Shultis, 2016; Rollins, Dearden & Fenell, 2016). Subsequently, the booming nature-based

tourism and eco-tourism industry in the area provide many opportunities for effective communication.

Park managers also recognized the need to foster community involvement in order to address mutually important issues. This is demonstrated in recent outreach efforts about dog-wolf conflicts in the park and surrounding area through innovative tracking programs, where visitors and local residents are encouraged to report any sign of wolves in the park (Parks Canada Human-Carnivore Conflict Specialist, personal communication, 2011, 2014). Events such as the local shorebird festival in Tofino during shorebird migration in May also provide promising outreach potential.

An increase in patrolling and enforcement of the on-leash regulation also commenced in 2003, along with the "dogs on-leash" signs and education. However, the size of the park makes it very difficult to manage (Zharakov, 2011). On March 23 and 24, 2017, a section of beach was temporarily closed as Parks Canada responded to an unprecedented wolf attack on an on-leash dog. A one-week dog ban was instituted for the entire Long Beach Unit and the park implemented hazing tactics with noise and pain deterrents.

Perhaps longer-term bans of dogs on beaches in the park, such as seasonal closures may be required. Zharikov (2011) found that 20% of National Parks in Canada and many protected areas on a global scale have complete or seasonal bans of dogs on front-country beaches. When allowed, dogs must be on-leash and in designated areas. At Long Beach, it appears that people are willing to comply with dog bans on park beaches. After the dog ban was lifted on March 27, Parks Canada thanked visitors who respected the dog ban to avoid further conflict (Parks Canada, personal communication, March 28, 2017). It may be important to harness that tone of urgency for zoning and seasonal closure tactics for managing the wolf-dog issue. Providing an alternative beach area or other location where dogs can run free may also make it easier for park visitors with dogs to engage in compliance behavior and mitigate conflict with both wolves and shorebirds.

Ongoing visitor noncompliance with dog leashing regulations has presented a significant challenge, highlighting the importance of theory in developing effective strategies to influence visitor behavior. Singular approaches to influencing behavior are occasionally successful; however, a diversity of tools typically creates more robust strategies (Mackenzie-Mohr, 2011). Other research has acknowledged the importance of layering strategies for greater effectiveness (Coghlan & Kim, 2012; Weiler & Smith, 2009).

Further research should consider the effectiveness of targeting norms and PBC in park messaging for high ambivalence visitors, rather than the usual reliance on shifting people's attitudes. Given the array of complementary strategies suggested, the potential for media and social media to influence behavior needs to be addressed. The TPB could also be applied again to measure the impact of recent media exposure and attention in the park on wolves and dogs, on compliance with the park on-leash regulation. After such high profile wolf activity in the park, research on visitor attitudes and perceptions of management decisions (i.e., dog bans and/or seasonal beach closures) would be valuable.

References

Ballantyne, R. & Hughes, K. (2006). Using front-end and formative evaluation to design and test persuasive bird feeding warning signs. *Tourism Management, 27*(2), 235–246.

Beeton, S., Weiler, B., & Ham, S. H. (2005). *Contextual analysis for applying persuasive communication theory to managing visitor behavior: A scoping study at Port Campbell National Park.* Gold Coast: Sustainable Tourism Cooperative Research Centre.

Bowes, M. (2015). Influences of social norms, habit and ambivalence on park visitors' dog leash compliance for protecting wildlife (Doctoral dissertation). University of Victoria, Victoria BC.

Bradford, L., & McIntyre, N. (2007). Off the beaten track: Messages as a means of reducing social trail use at St. Lawrence Islands National Park. *Journal of Park Recreation and Administration, 25*(1), 1–21.

Breckler, S. J. (1994). A comparison of numerical indices for measuring attitudinal ambivalence. *Educational and Psychological Measurement, 54,* 350–365.

Brown, T., Ham, S., & Hughes, M. (2010). Picking up litter: An application of theory-based

communication to influence tourist behavior in protected areas, *Journal of Sustainable Tourism. 18*, 879–900.

Castro, P., Garrido, M., Reis, E., & Menezes. (2009). Ambivalence and conservation behavior—The recycling of metal cans. *Journal of Environmental Psychology, 29,* 24–33.

Coghlan, A., & Kim, A. K. (2012). Interpretive layering in nature-based tourism: A simple approach for complex attractions. *Journal of Ecotourism, 11*, 173–187.

Conner, M., Povey, R., Sparks, P., James, R., & Shepherd, R. (2003). Moderating role of attitudinal ambivalence within the theory of planned behavior. *British Journal of Social Psychology, 42,* 75–94.

Conner, M., & Sparks, P. (2002). Ambivalence and attitudes. *European Review of Social Psychology. 12*, 37–70.

Costarelli, S., & Colloca, P. (2004). The effects of attitudinal ambivalence on pro-environmental behavioral intentions. *Journal of Environmental Psychology. 24*, 279–288.

Esrom, J. (2004). *Dogs, shorebirds, and conflict management: recreation and ecological integrity at Long Beach, Pacific Rim National Park Reserve, British Columbia*. Toronto, Canada: MSc Thesis, York University.

Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach.* New York, NY: Taylor and Francis.

Festinger, L. (1957). *A theory of cognitive dissonance*. Evaston, IL: Row Peterson.

Ham, S., Brown, T. J., Curtis, J., Weiler, B., Hughes, M., & Poll, M. (2009). Promoting persuasion in protected areas: A guide for managers who want to use strategic communication to influence visitor behavior. Retrieved from www.crctourism.com.au.

Hughes, M., Ham, S., & Brown, T. (2009). Influencing park visitor behavior: A belief-based approach. *Journal of Park and Recreation Administration. 27*(4), 38–53.

Hughes, M., & Morrison-Saunders, A. (2005). Influence of on-site interpretation intensity on visitors to natural areas. *Journal of Ecotourism, 4*(3), 161–177.

Hevenegaard, G., Shultis, J., & Butler, J. (2009). The role of interpretation. In P. Dearden, R. Rollins, & M. Needham (Eds.), *Parks and protected areas in Canada: Planning and management* (3rd ed., pp. 202–233). Oxford, UK: Oxford University.

Hevenegaard, G., & Shultis, J. (2016). The role of interpretation. In P. Dearden, R. Rollins, & M. Needham (Eds.), *Parks and protected areas in Canada: Planning and management* (4th ed., pp. 141-169). Oxford, UK: Oxford University.

Jonas, K., Brömer, P., & Diehl, M. (2000). Attitudinal ambivalence. *European Review of Social Psychology, 11*, 35–74.

Kenny, D. A. (1987). *Statistics for the social and behavioral sciences.* Boston, MA: Little, Brown.

Knapp, D., & Benton, G. M. (2004). Elements to successful interpretation: A multiple case study of five national parks. *Journal of Interpretation Research, 9*(2), 9–25

Knudson, D. M., Cable, T. T., & Beck, L. (2003). *Interpretation of cultural and natural resources.* State College, PA: Venture.

Kojola, I., & Kuittinen, J. (2002). Wolf attacks on dogs in Finland. *Wildlife Society Bulletin, 20*, 498–501.

Krosnick, J. A., & Petty, R. E. (2014). Attitudes strength: An overview. In R. E. Petty & J. A. Krosnick (Eds.), *Attitudes strength: Antecedents and consequences* (pp. 1–24). Mahwah, NJ: Erlbaum.

Lackey, B. K., & Ham, S. H. (2003). Contextual analysis of interpretation focused on human–black bear conflicts in Yosemite National Park. *Applied Environmental Education and Communication, 2,* 11–21.

Linnell, J. D. C., Andersen, R., Andersone, Z., Balciauskas, L., Blanco, J. C., Boitani, L., … Wabakken, P. (2002). The fear of wolves: A review of wolf attacks on humans, *Nina Oppdragmelding*, 731, 1–65.

Mackenzie-Mohr, M. (2011). *Fostering sustainable behavior.* Gabriola Island, BC: New Society Publishers.

Maio, G. R., Bell, D. W., & Esses, V. M. (1996). Ambivalence and persuasion: The processing of messages about immigrant groups. *Journal of Experimental Social Psychology, 3,* 513–536.

Meager, J. J, Schlacher, T. A., & Nielsen, T. (2012). Humans alter habitat selection of birds on ocean-exposed sandy beaches. *Diversity and Distributions, 18*, 294–306.

Pacific Rim National Park sees first wolf attack on an on-leash dog [Video file]. 2017, March 23). Retrieved from http://www.cheknews.ca/pacific-rim-national-park-sees-first-wolf-attack-leash-dog-292856/.

Priester, J. R., & Petty, R. E. (1996). The gradual threshold model of ambivalence: Relating the positive and the negative bases of attitudes to subjective ambivalence. *Journal of Personality and Social Psychology, 71*, 431–449.

Rollins, R., Dearden, P., & Fenell, D. (2016). Tourism, ecotourism and protected areas. In P. Dearden, R. Rollins, & M. Needham (Eds.), *Parks and protected areas in Canada: Planning and management* (4th ed., pp. 141–169). Oxford, UK: Oxford University.

Sparks, P., Conner, M., James, R., Shepherd, R., & Povey, R. (2001). Ambivalence about health-related behaviors: An exploration in the domain of food choice. *British Journal of Health Psychology, 6*, 53–68.

Tsai, W.-H., Chou, W.-C., & Lai. C.-W. (2010). An effective evaluation model and improvement analysis for national park websites: a case study of Taiwan. *Tourism Management, 31*, 936–942.

Vaske, J. J. (2008). Survey research and analysis: applications in parks, recreation, and human dimensions. State College, PA. Venture.

Vaugois, N., Rollins, R., & McDonald, D. (2007). Rural tourism development in central British Columbia: Observation report from the tourism research innovation project (TRIP). Retrieved from web.mala.bc.ca/vaugois/default.html

Weber, R.P. (1990). *Basic content analysis.* Newbury Park, CA: Sage Publications.

Weiler, B., & Smith, L. (2009). Does more interpretation lead to greater outcomes? An assessment of the impacts of multiple layers of interpretation in a zoo context. *Journal of Sustainable Tourism, 17*, 91–105.

Zharikov, Y. (2011). *Toward mitigating migratory shorebird displacement on Long Beach: A case study and a discussion paper.* Pacific Rim National Park Reserve.