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Conflicting social norms and community conservation compliance

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ABSTRACT

Though the success of conservation initiatives relies on changing behaviour, little social psychological research has examined factors such as attitudes and social norms in the context of actual conservation campaigns. In the context of reducing light pollution around sea turtle nesting habitats, researching technological solutions has clear merit. Problems such as light glow are, however, fundamentally about human behaviour, and so finding ways to effect behavioural change is critical. Social norms, or perceptions about what other people think and do, have been widely used in behaviour change campaigns across various domains, including campaigns to promote conservation behaviour. Here, we investigate how the norms of different groups may influence our behaviour in the context of a campaign to alter behavioural norms about light glow pollution in a community. We examine attitudes, social norms, and the degree of conflict (versus congruence) between the behaviours of different groups, and their relationship with intentions to engage in conservation behaviours relevant to sea turtle conservation. We show that attitudes and norms are related to behavioural intentions, and conflicts between social norms influence intentions, over and above the norms themselves. This highlights an important consideration for conservation campaigns utilising social norms-based behaviour change appeals.

Introduction

A major barrier to the success of conservation programs worldwide is getting people to change their behaviour (Mascia et al., 2003; Schultz, 2011). Psychologists have identified a range of variables underlying people's pro-environmental behaviours (or lack thereof), including attitudes, values, social norms, and self-interest (e.g., De Groot & Steg, 2009; Stern, 2000). While compliance with environmental campaigns has been of great interest to psychologists (Cialdini, 2003), comparatively little research in conservation settings addresses these psychological factors, compared to a focus on documenting problems and finding technical solutions (e.g., Bertolotti & Salmon, 2005; Frazer, 1992). Sea turtle conservation initiatives – the focus of the present paper – are no exception. Research focuses on technological solutions to threats such as light pollution (Bertolotti & Salmon, 2005; Frazer, 1992), which draws turtle hatchlings away from the ocean to die on land, yet light pollution stems directly from human behaviour. The current study aims to investigate the importance of psychological factors in the context of an ongoing conservation campaign to protect nesting sea turtle populations.

Sea turtle populations worldwide are under threat from a range of sources, from illegal harvest of turtles and eggs to accidental capture in fishing equipment (Heppell et al., 2003). The Woongarra Coast area of Queensland, Australia, is home to an internationally significant nesting ground for loggerhead turtles (Pfaller et al., 2009). Although conservation efforts such as the implementation of turtle exclusion devices on fishing trawlers in Australia have minimised some pressures on the population (Brewer et al., 2006), increasing coastal development now poses a new threat. In response to the increasing levels of light pollution in the area, the state government implemented the "Cut the Glow to Help Turtles Go" campaign in 2008. The main aim of the campaign is to reduce light pollution, which is a serious concern for sea turtle conservation, given the propensity for artificial light to cause disorientation and associated mortality among turtle hatchlings, and impact nesting behaviours of adult turtles (Longcore & Rich, 2004; Salmon et al., 1995).

Conservation campaigns have traditionally sought to change people's knowledge or attitudes toward issues in an attempt to get them to change their behaviour (Stern, 2000). However, there is often a significant gap between knowledge or attitudes and subsequent behaviour (e.g., Kollmuss & Agyeman, 2002; Owens, 2000). For example, while people may have positive attitudes to saving sea turtles, and relatively good knowledge of the threat of light pollution, it may still be difficult to change their lighting use radically. People are used to certain patterns of behaviour, and using

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outdoor lighting is the norm in many communities, making changes to routine behaviours difficult. In the current paper we explore the influence of social norms and attitudes on people's motivation to engage in light glow reduction behaviours.

Social norms and conservation behaviour

Social norms are the accepted or implied rules about how people should, and do, behave (Sherif, 1936). A large body of psychological research has examined the power of both perceptions of what others do (descriptive norms), and perceptions about what others approve of (injunctive norms) to influence individual behaviour (e.g., Cialdini et al., 1990; Rimal, 2008; Schultz et al., 2007; Terry & Hogg, 1996). This literature has demonstrated the power of social norms to influence people's own behaviours. For example, Cialdini and colleagues (1990), showed that littering rates jumped from six percent to fifty-four percent after participants saw another individual drop a piece of litter into a littered environment (conveying a pro-littering norm) as opposed to a clean environment (conveying an anti-littering norm).

Governments and interest groups spend millions on norms-based approaches to behaviour change in various domains, yet their outcomes are not always straightforward (Blanton et al., 2008; Schultz et al., 2007). This may be due in part to the somewhat constrained contexts in which norms-based appeals are often tested, such as when people are told what a single other person, or a single social group does (e.g., Goldstein et al., 2008; Louis et al., 2007; Terry & Hogg, 1996). While such studies provide valuable insights about decision making in specific contexts, they do not shed light on how people respond to norms in their larger social world, where they are exposed to information about the norms of multiple groups. In the current study we examine the influence of the social norms of multiple groups in the context of a campaign to promote turtle conservation, and investigate why norms-based appeals may motivate some, while discouraging others.

Theorists have argued that many high profile environmental campaigns fail to produce positive outcomes because people ironically infer counter-productive social norms from the content of the appeals. Cialdini (2003) cites the "Iron eyes Cody" campaign as an example of an appeal that, in attempting to draw attention to the regrettably high incidence of littering, succeeds in doing just that: highlighting the high incidence of littering, and thus (contrary to campaigners' intentions) reinforcing such behaviour as a social norm. One study demonstrated this experimentally (Cialdini, 2003). Theft of petrified wood from the U.S. Petrified Forest National Park was higher (7.92% vs. 1.67%) when signs conveyed a descriptive norm of theft ("Many past visitors have removed petrified wood from the Park, changing the natural state of the Petrified Forest"), compared to signs conveying an injunctive norm against it ("Please don't remove the petrified wood from the Park, in order to preserve the natural state of the Petrified Forest").

Examples such as these underscore the need for social and natural scientists to work collaboratively to achieve conservation goals. In the current study we address this by applying social psychological research on social norms to a conservation context and critically, we examine the larger social context, whereby the norms of multiple groups may impact conservation behaviour.

The effects of multiple norms for conservation behaviour

Though previous research has demonstrated the power of social norms to influence behaviour, one critical aspect of norms that has received little attention is the recognition that we are all members of multiple social groups. When considering these multiple groups (such as family, friends, colleagues and neighbours), we must also acknowledge the possibility that the norms of these different groups may conflict (McDonald et al., 2014). In the context of an intervention designed to alter the light use norms of an entire community, during the process of behaviour change, some groups will change their behaviour whereas others will not. We propose that, in this context, it may be difficult for people (especially those not committed to the issue) to ascertain what behaviour is normative and appropriate. One's household and one's neighbourhood may have markedly different norms when it comes to light use. One's neighbours may continue to use outdoor lighting, while one's family members attempt to embrace the campaign, installing sensor lighting and taking care to draw the curtains after dark. If some groups are not taking action on a collective problem, it may undermine the perception that action is effective (Olson, 1971) and thus reduce intentions to engage in the behaviour (Ellen et al., 1991).

In this scenario, we suggest two potential reactions to this highly visible *norm-conflict*. In the face of norm-conflict, some people may continue to see their individual contribution to reducing the problem as important, and therefore be relatively immune to the effects of conflicting norms. On the other hand, others could appraise the efforts of their family as ineffective given the lack of action from others, and thus be less inclined to act. Previous work has demonstrated that conflict or congruence between the norms of people's groups influences their perceptions that taking environmental action is effective, and their actual pro-environmental intentions and behaviours, and that norm-conflict is particularly demotivating for people with less positive attitudes toward conservation (McDonald et al., 2014). These divergent responses to norm-conflict may arise because, for those less interested in environmental issues, norm-conflict signals that not all others are acting, and taking action is therefore ineffective and futile. In contrast, for those with positive attitudes to environmental issues, the knowledge that some are not acting may have little impact on their intentions; they may continue to act either to compensate for a lack of action by others, or try to set a positive pro-environmental example.

When deciding whether to comply with the recommendations of the "Cut the Glow" campaign, people are likely to be aware of the extent to which their neighbours, friends, and the community are taking action to reduce their light glow. The current paper investigates psychological variables that may influence compliance with conservation measures across the norms of multiple groups. We ask whether a lack of consistency among norms, which are an inevitable stage of a norm change process, undermines the power of a message urging people to adopt a 'dark community' norm. Though the current study explores the influence of norm-conflicts on behaviours related to sea turtle conservation efforts, we propose that the effects of norm-conflict are likely to be relevant to other conservation behaviours, particularly where the behaviour in question is visible and needs to be enacted collectively.

Method

Case study

The "Cut the Glow to Help Turtles Go" campaign was launched in the Woongarra Coast region of Queensland, Australia in 2008 by the Queensland Parks and Wildlife Service. The campaign was initiated in response to concerns that increasing coastal development in the region may be negatively impacting the populations of nesting sea turtles in the area, due to the increased ambient light glow in coastal areas. The "Cut the Glow" campaign aimed to establish a dark community norm, such that residents and businesses avoid the use of unnecessary lighting, and undertake simple measures to reduce light glow from their homes and offices during the turtle nesting season.

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Table 1
Means, standard deviations and intercorrelations among variables included in multiple regression analyses.

	Mean	SD	1	2	3	4
1. Behavioural Intentions	4.33	.83	1			
2. Descriptive norms	36.88	21.57	.35*	1		
3. Attitudes	6.05	1.12	.50**	.23	1	
4. Norm-conflict	9.19	10.11	.15	.04	.31*	1
5. Attitude × norm-conflict interaction	–	–	−.13	−.22	−.54**	.37**

Note: Behavioural Intentions measured on a 1–5 scale; attitudes measured on a 1–7 scale; norms measured as a percentage of the number of people who engage in the behaviour (0–100%); norm-conflict is the absolute value of the three way difference score between the three group norm ratings.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

The campaign has involved a variety of initiatives in the community to communicate the importance of reducing light glow, and to educate residents and visitors on strategies they can implement to reduce light glow in the area. The campaign materials have focussed on the danger to turtles from light glow and strategies to reduce household light glow.

Participants

Participants were 57 residents of the Woongarra Coast Region (mean age = 43.09 years, SD = 14.99); 37 women and 16 men (four unspecified). Participants were either recruited around shopping centres and community group meetings throughout the Woongarra Coast area to complete the study via a printed survey, or via local media requests to participate in an online version of the survey. Only three participants were members of environmental groups, but as results did not differ with and without these participants the full sample was retained in the analyses below.

Measures

The questionnaire first assessed participants' attitudes toward the campaign with six questions (Ajzen, 1991), e.g. "I think that the 'Cut the Glow to Help Turtles Go' campaign is good for the community," "I think that the 'Cut the Glow to Help Turtles Go' campaign will negatively impact on tourism" (1, *strongly disagree* to 7, *strongly agree*). These items formed a reliable scale (Cronbach's $\alpha = .88$).

The questionnaire then assessed the *descriptive norms* (norms regarding perceptions of whether others actually engage in the target behaviour) of three groups (friends, neighbours, the local community) for three light glow reduction behaviours (turning off exterior lighting, turning off unnecessary interior lighting, closing curtains and blinds after 7:30pm). Participants were asked to estimate the percentage of members of each group who engaged in each of the behaviours during the previous sea turtle nesting season, on a scale ranging from 1–100%. Responses to these items were averaged to create indices of the *descriptive norm* of each group for engaging in the behaviours. The overall norm was computed from the average of the three group norms (Cronbach's $\alpha = .96$).

In order to create an index of *norm-conflict*, the mean of the absolute value of the *three-way difference score* between the descriptive norms of the three groups was computed, following the formula:

$$\text{mean}\ [\text{abs}(\text{Norm}_{\text{neighbour}} - \text{Norm}_{\text{friend}}) + \text{abs}(\text{Norm}_{\text{community}} - \text{Norm}_{\text{neighbour}}) + \text{abs}(\text{Norm}_{\text{community}} - \text{Norm}_{\text{friend}})]$$

This method gives an average of the extent to which the behaviour of each of the three groups differs from the others, and is identical to the procedure used in previous studies of norm-conflict (McDonald et al., 2014). Norm conflict scores obtained ranged from 0–40.

Behavioural intentions to engage in each of the behaviours were measured with three items, each assessing intentions to engage in one of the three light glow reduction behaviours, e.g., "I intend to close curtains and blinds after 7:30pm" (1, *never* to 5, *always*). The three items were averaged and formed a reliable scale ($\alpha = .88$).

Results

Effects of conflicting norms

Means, standard deviations and bivariate correlations are shown in Table 1. As the table shows, attitudes to the campaign were very favourable, and on average people rated the various groups as engaging in light glow reduction behaviours 37% of the time (individual group norms ranged from 0–100% for all groups). To examine the effects of attitudes and norms in more detail, *moderated multiple regression* analysis was performed. Moderated multiple regression allows us to establish whether the relationship between two variables (e.g., norm conflict and environmental behaviour) differs as a function of a third variable (e.g., attitudes; see Aiken and West, 1991). In order to establish moderation, we followed procedures outlined by Aiken and West (1991), and created a multi-step regression equation. Predictors and covariates were centred by subtracting the mean. Covariates were then entered at the Step 1 of the regression equation. Next, the centred independent variable and the moderator are added at Step 2. Finally, at Step 3, the product term between the independent variable and the moderator is entered into the analysis. A significant R^2 change and beta for the interaction term at Step 3 indicates the presence of a moderating effect.

In the present analysis, attitudes, norm-conflict, and the interaction between them were regressed onto behavioural intentions, controlling for the effects of the overall group norms. It is important to control for the overall descriptive norm as otherwise the effects of norm-conflict may simply reflect a weaker overall norm of behaviour. That is, it may be that those who perceive congruence do so because everyone acts (i.e., a strong positive norm, as opposed to a congruent norm of inaction), whereas those who perceive conflict do so because some act and some do not. By controlling for the overall norm, we ensure that it is the difference between the groups, not their average level of behaviour, that is linked to intentions. Due to missing data on some variables, the final sample available for this analysis was 47 participants.[1]

At Step 1, the overall descriptive norm explained a significant amount of variance in intentions ($R^2 = .15$, $F(1, 45) = 7.71$, $\beta = .38$, $p = .008$), such that perceptions that groups are engaging in light glow reduction behaviours were associated with higher

[1] The individual behavioural beliefs are not considered as unique predictors as they are intercorrelated (*rs* .30 to .80) and theorised to underpin attitudes (Ajzen, 1991), which are already included in the model.

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Table 2
Moderated multiple regression analysis predicting intentions from descriptive norms, attitudes, norm-conflict, and the interaction between attitude and norm-conflict.

Variable	Final β
Step 1	R^2 = .15, $F(1,45)$ = 7.71, p = .008
Descriptive norms	.38**
Step 2	R^2_{change} = .17, $F_{change}(2,43)$ = 5.29, p = .009
Descriptive norms	.25†
Attitudes	.43**
Norm-conflict	.01
Step 3	R^2_{change} = .06, $F_{change}(1,42)$ = 4.07, p = .050
Descriptive norms	.27
Attitudes	.71**
Norm-conflict	−.22
Norm-conflict × attitude interaction	.39*

* p < .05.
** p < .01.
*** p < .001.
† p < .07.

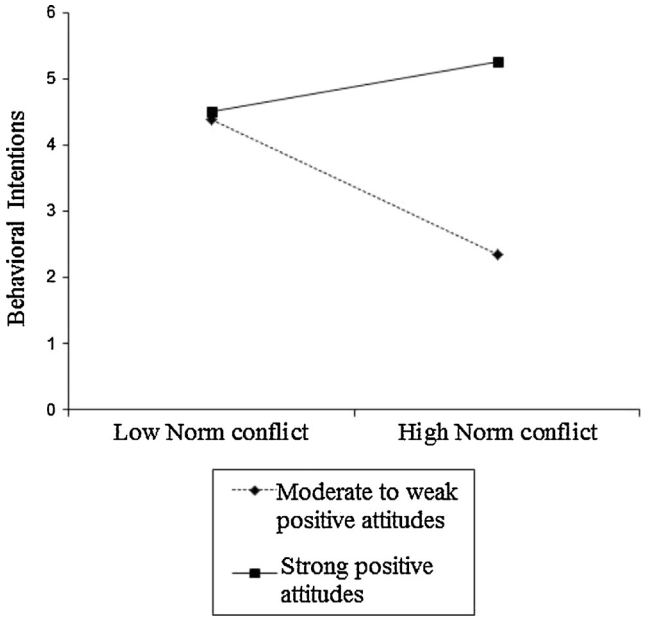

Fig. 1. Interaction between norm-conflict and attitudes on behavioural intentions showing the effect of conflict for those with stronger versus weaker positive attitudes to the 'Cut the Glow' Campaign. Note that this analysis does not reflect dichotomous groups on this variable, but rather estimates the effect of norm conflict at one standard deviation above and below the mean.

intentions to engage in these behaviours. The addition of attitudes (β = .43, p = .004) and norm-conflict (β = .01, p = .940), at Step 2, significantly increased the variance accounted for (R^2_{change} = .17, $F_{change}(2,43)$ = 5.29, p = .009), though norm-conflict was not a significant predictor. As expected, community members with more positive attitudes to light glow reduction had stronger intentions to engage in these behaviours. At Step 3, the addition of the attitude by norm-conflict interaction term significantly increased the amount of variance explained (R^2_{change} = .06, $F_{change}(1,42)$ = 4.07, β = .39, p = .050; Table 2), though this effect was small. To decompose the significant interaction, simple slopes analyses were performed with norm-conflict as the focal independent variable. The results of these analyses revealed that, for those with less positive attitudes (−1 SD) to the "Cut the Glow" campaign, norm-conflict was associated with marginally lower intentions to engage in light glow reduction behaviours (β = −.68, p = .070). For those with more positive attitudes (+1 SD), norm-conflict was not related to behavioural intentions (β = .23, p = .178; Fig. 1).

Discussion

Previous research has highlighted the impact of norms on various behaviours in the environmental domain (Cialdini et al., 1990; Goldstein et al., 2008; Nolan et al., 2008; Schultz et al., 2007). The present study confirms the important role of descriptive norms from past research, and extends this research to the context of a real world biodiversity conservation campaign. In addition, the present research highlights the influence of psychological variables on intentions to comply with the recommendations of the campaign. Consistent with previous research (McDonald et al., 2014), this study also demonstrated that in addition to attitudes and global descriptive norms, the degree of conflict or congruence between various group norms influences intentions to engage in pro-environmental behaviour. However, the present work (a) demonstrates the effect in relation to an ongoing conservation campaign, (b) identifies the importance of attitudes to the campaign as a moderator, and (c) highlights the danger that a campaign which makes salient conflicting perceptions of groups' behaviour will de-motivate those who are indifferent to the campaign. In demonstrating the effects of norm-conflicts on intentions to engage in light glow reduction behaviours, the current study makes an important contribution to understanding how psychological processes can influence real world conservation challenges.

There are some, however, limitations to the current study. The sample size was small, and biased toward those who had positive attitudes to sea turtle conservation and light glow reduction. This means that when discussing the effects for those with "low" attitudes, these people represent more moderate attitudes, and thus the current study doesn't shed light on the effects of conflict for those who hold more negative attitudes to light glow reduction. In addition, ceiling effects mean that the current study does not speak to the potentially motivating effects of norm conflict for those with strong positive attitudes. Furthermore, we only had measures of behavioural intentions, not actual behaviour. The groups we examined in the current study could be considered as nested groups (i.e., members of one group are also members of another group), however, to the extent that this is true, norms should be more similar between groups, and conflict reduced, thus the presence of nested groups, though not ideal, would work against the possibility of finding effects of norm conflict. However, the findings largely are in line with previous research on larger, more diverse samples (McDonald et al., 2013), and thus provide a useful insight for how norm conflict operates in the context of a community conservation issue.

Implications

The current study highlights the role of perceived social norms in influencing sea turtle conservation behaviours, but shows it may be the difference between the norms, rather than the overall perception of the descriptive norm that is critical to behaviour in this domain. The current findings also have specific implications for the design of social norms-based behaviour change appeals more generally, as they suggest that such appeals may fail if they unwittingly highlight a discrepancy in the behaviour of various groups of people. It is not necessarily the perception of the social norms of one relevant group that may influence conservation behaviour, but the extent to which various groups are making similar efforts. Though further research is required, a first step may be to focus on the norms of more inclusive groups (that is, rather than the norms of smaller subgroups) when attempting to communicate the utility of taking action to face conservation challenges. That is, a focus on community norm messages "joining the community in cutting

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light glow" rather than an appeal to "join your friends/neighbours in cutting light glow" may prove most effective, as it will avoid highlighting that certain subgroups are not taking action. In terms of other environmental issues, this suggests that perhaps highlighting global norms around action on climate change may help to avoid the sense of futility caused by the perception that other nations are not taking action to address the problem.

Although the current study investigates the effects of social norms in the context of sea turtle conservation, the present findings have implications for encouraging community support for conservation initiatives for a range of species. Like altering light use habits to protect sea turtles, other human activities such as plastic bag use, cigarette disposal, and driving in wildlife habitats have clear and important implications for conservation of various species. The current work supports the finding in previous research that social norms are an important consideration for changing human behaviours that relate to the environment, but suggests that the interplay of the norms of various groups may be important in influencing behaviour. It also extends this finding to a domain where the goal is species preservation, rather than more anthropocentric concerns such as reducing waste or preventing pollution. The present research suggests that those seeking to protect vulnerable species by changing human behaviours can harness the power of social norms to encourage behaviour change, but the way in which messages about social norms are constructed should take into account the range of groups which may influence decisions about a given set of behaviours.

Conclusion

In sum, the current study provides insights into how normative influence plays out during a conservation campaign aimed at altering norms of behaviour in a community, and highlights the importance of investigating the psychology underpinning people's behavioural decisions in conservation contexts. This study also demonstrated that, over and above general perceptions of the behaviour of others, the degree of conflict or congruence among the norms of multiple groups also influences individuals' responses to a conservation campaign. These results highlight the need to consider the complexity of the social environment in the design of conservation interventions. In addition, the examination of the effects of social norms within the context of a real world conservation problem represents an important extension of previous laboratory-based investigations of psychological phenomena with implications for environmental conservation.

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References

Aiken, L. S., & West, S. G. (1991). Multiple regression: Testing and interpreting interactions. In *Sage*. CA.: Newbury Park.

Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes*, *50*(2), 179–211.

Bertolotti, L., & Salmon, M. (2005). Do embedded roadway lights protect sea turtles? *Environmental Management*, *36*(5), 702–710. http://dx.doi.org/10.1007/s00267-004-0288-2

Blanton, H., Köblitz, A., & McCaul, K. D. (2008). Misperceptions about norm misperceptions: Descriptive, injunctive, and affective 'social norming' efforts to change health behaviours. *Social and Personality Psychology Compass*, *2*(3), 1379–1399.

Brewer, D., Heales, D., Milton, D., Dell, Q., Fry, G., Venables, B., & Jones, P. (2006). The impact of turtle excluder devices and bycatch reduction devices on diverse tropical marine communities in Australia's northern prawn trawl fishery. *Fisheries Research*, *81*(2–3), 176–188. http://dx.doi.org/10.1016/j.fishres.2006.07.009

Cialdini, R. B. (2003). Crafting normative messages to protect the environment. *Current Directions in Psychological Science*, *12*(4), 105–109.

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A Focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, *58*(6), 1015–1026.

De Groot, J. I. M., & Steg, L. (2009). Mean or green: Which values can promote stable pro-environmental behaviour? *Conservation Letters*, *2*(2), 61–66. http://dx.doi.org/10.1111/j.1755-263X.2009.00048.x

Ellen, P. S., Wiener, J. L., & Cobb-Walgren, C. (1991). The role of perceived consumer effectiveness in motivating environmentally conscious behaviours. *Journal of Public Policy & Marketing*, *10*(2), 102–117.

Frazer, N. B. (1992). Sea turtle conservation and halfway technology. *Conservation Biology*, *6*(2), 179–184. http://dx.doi.org/10.1046/j.1523-1739.1992.620179.x

Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. *Journal of Consumer Research*, *35*(3), 472–482. http://dx.doi.org/10.1086/586910

Heppell, S. S., Snover, M. L., & Crowder, L. B. (2003). Sea turtle population ecology. In P. L. Lutz, J. A. Musick, & J. Wyneken (Eds.), *The biology of sea turtles* (Vol. 2) (pp. 275–306). Boca Raton: CRC Press.

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behaviour? *Environmental Education Research*, *8*(3), 239–260.

Longcore, T., & Rich, C. (2004). Ecological light pollution. *Frontiers in Ecology and the Environment*, *2*(4), 191–198. http://dx.doi.org/10.1890/1540-9295(2004)002[0191:elp2.0.co;2]

Louis, W. R., Davies, S., Smith, J. R., & Terry, D. J. (2007). Pizza and pop and the student identity: The role of referent group norms in healthy and unhealthy eating. *Journal of Social Psychology*, *147*(1), 57–74.

Mascia, M. B., Brosius, J. P., Dobson, T. A., Forbes, B. C., Horowitz, L., McKean, M. A., & Turner, N. J. (2003). Conservation and the Social Sciences. *Conservation Biology*, *17*(3), 649–650. http://dx.doi.org/10.1046/j.1523-1739.2003.01738.x

McDonald, R. I., Fielding, K. S., & Louis, W. R. (2013). Energizing and de-motivating effects of norm-conflict. *Personality and Social Psychology Bulletin*, *39*(1), 57–72.

McDonald, R. I., Fielding, K. S., & Louis, W. R. (2014). Conflicting norms highlight the need for action. *Environment & Behaviour*, *46*(2), 139–162.

Nolan, J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative social influence is under detected. *Personality and Social Psychology Bulletin*, *34*(7), 913–923. http://dx.doi.org/10.1177/0146167208316691

Olson, M. (1971). *The logic of collective action: Public goods and the theory of groups*. Cambridge: Harvard University Press.

Owens, S. (2000). 'Engaging the public': Information and deliberation in environmental policy. *Environment and Planning A*, *32*(7), 1141–1148.

Pfaller, J. B., Limpus, C. J., & Bjorndal, K. A. (2009). Nest-site selection in individual loggerhead turtles and consequences for doomed-egg relocation. *Conservation Biology*, *23*(1), 72–80. http://dx.doi.org/10.1111/j.1523-1739.2008.01055.x

Rimal, R. N. (2008). Modeling the relationship between descriptive norms and behaviours: A test and extension of the theory of normative social behaviour (TNSB). *Health Communication*, *23*(2), 103–116.

Salmon, M., Tolbert, M. G., Painter, D. P., Goff, M., & Reiners, R. (1995). Behaviour of loggerhead sea turtles on an urban beach. II. Hatchling orientation. *Journal of Herpetology*, *29*(4), 568–576.

Schultz, P. W. (2011). Conservation means behaviour. *Conservation Biology*, *25*(6), 1080–1083. http://dx.doi.org/10.1111/j.1523-1739.2011.01766.x

Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science*, *18*(5), 429–434.

Sherif, M. (1936). *The psychology of social norms*. Oxford: Harper.

Stern, P. C. (2000). New environmental theories: Toward a coherent theory of environmentally significant behaviour. *Journal of Social Issues*, *56*(3), 407–424.

Terry, D. J., & Hogg, M. A. (1996). Group norms and the attitude-behaviour relationship: A role for group identification. *Personality and Social Psychology Bulletin*, *22*(8), 776–793. http://dx.doi.org/10.1177/0146167296228002

Please cite this article in press as: McDonald, R. I., et al. Conflicting social norms and community conservation compliance. *Journal for Nature Conservation* (2014), http://dx.doi.org/10.1016/j.jnc.2013.11.005