Please cite as

Dolnicar, S., Knezevic Cvelbar, L., & Grün, B. (2018). Changing service settings for the environment: How to reduce negative environmental impacts without sacrificing tourist satisfaction. *Annals of Tourism Research*, 76:301-304.

<https://doi.org/10.1016/j.annals.2018.08.003>

Changing service settings for the environment

How to reduce negative environmental impacts without sacrificing tourist satisfaction

Sara Dolnicar, University of Queensland, Australia

Ljubica Knezevic Cvelbar, University of Ljubljana, Slovenia

Bettina Grün, Johannes Kepler University Linz, Austria

In the European Union alone, cotton serviettes provided to hotel guests at breakfast buffets every day cause carbon emissions equivalent to a car driving around the world 36 times. We test the feasibility of providing less CO₂-intensive hotel services without reducing guest satisfaction in a quasi-experiment. We change serviette provision at a 4* hotel from thick cotton serviettes to (less water and CO₂-intensive) recycled paper serviettes, while still enabling guests to get a thick cotton serviette. The changed setting reduces cotton serviette use by 95%. Most importantly for industry adoption: guest satisfaction does not drop.

Tourism and the environment

Tourism is one of the most polluting industries. From 2009 to 2013 its carbon footprint increased from 3.9 to 4.5 GtCO₂, representing 8% of total global greenhouse gas emissions (Lenzen et al., 2018). Changing tourist behaviour can reduce this negative impact because tourists “have the largest adaptive capacity of elements within the tourism system” (Gössling et al., 2012, p. 36). But tourists do not voluntarily change their behaviour in consideration of the environment (Miller et al., 2010); attempts to convince tourists to behave more environmentally friendly failed to change behaviour (Dolnicar, Knezevic Cvelbar & Grün, 2017), possibly because the vacation context is unique (Juvan & Dolnicar, 2014). At home, people engage in habitual pro-environmental behaviour (Lavelle, Rau, & Fahy, 2015), on vacation people desire change. With the change in context – shown by Barr, Shaw and Coles (2011) to influence pro-environmental behaviour – positive habits are abandoned, leading to lower engagement in pro-environmental behaviour. The reason may be the change of context itself, with the vacation context not offering the infrastructure required to display the usually habitual behaviours. Alternatively, or in addition, the vacation context is also primarily pleasure focused. Consequently, people’s values and beliefs may not align as closely to their behaviour as they do at home, instead tourists justify environmentally unfriendly behaviour (Juvan & Dolnicar, 2014) in ways which are “socially and morally acceptable

by peers of those travelling” (Buckley, 2011, p. 1180). This may be the reason that interventions based on values and beliefs proven to be successful in the everyday living context fail in tourism (Dolnicar, Knezevic Cvelbar & Grün, 2017). Changing behavioural options available to tourists through service settings may therefore represent a promising alternative, as long as tourist satisfaction is not negatively affected.

Methodology

We conducted a quasi-experimental field study in a four-star rated hotel in Bohinj, Slovenia (96 rooms) to test if changing service from a “grey (environmentally non-friendly option)” to a “green (environmentally friendly option)” setting induces pro-environmental behaviour without reducing guest satisfaction. The hotel hosted 9,683 guests (29,049 guest nights) in 2016 and offers a free buffet breakfast. We changed a service setting by replacing thick cotton serviettes (grey setting, measured in July, 28 observed values) at the breakfast tables with recycled paper serviettes (green, measured in August, 31 observed values). During the green setting, table signs informed guests that recycled paper serviettes are offered for environmental reasons. Due to concerns about negative guest reactions, hotel management did not give permission for use of table signs during their usual (the grey) setting, nor did it permit the green setting without table signs. During July and August the hotel had 4,747 and 6,223 overnight stays, respectively.

The key dependent variable was the number of cotton serviettes used. We chose actual behaviour to avoid bias associated with self-reporting of environmentally significant behaviours (Juvan & Dolnicar, 2016). Control variables were: check-in date, check-out date, number of adults in the room, number of children in the room, type of guest (leisure, business), room type (standard, superior, other) and country of origin. We added questions to the routine hotel guest survey asking about satisfaction with serviettes.

Differences across experimental conditions were assessed using a Wilcoxon rank-sum test (Table 1). Average cotton serviette use per day dropped from 176.8 to 9.1. Hotel occupancy was slightly higher in August than July and more adults stayed at the hotel during this time. In August, guests stayed slightly longer, were more likely leisure tourists, less likely domestic tourists, and more likely staying in a superior room. This indicates that – despite using comparable months – differences exist, requiring the inclusion of control variables in the analysis.

Table 1

Differences across study conditions.

	Grey setting		Green setting		Wilcoxon rank-sum test
	Mean	Std. Dev.	Mean	Std. Dev.	<i>p</i> value
Number of cotton serviettes	176.8	38.2	9.1	5.5	< 0.001
Number of rooms	72.8	16.6	85.4	16.4	0.002
Number of adults	129.3	32.0	156.1	30.4	0.003
Number of children	40.3	10.0	44.6	10.9	0.09
First day	31.2%	14.8%	27.5%	11.1%	0.50
Leisure	91.4%	13.7%	95.3%	13.3%	0.005
Domestic tourist	11.6%	4.5%	9.3%	4.1%	0.05
Standard room	49.8%	3.5%	43.7%	2.8%	< 0.001
Superior room	24.2%	3.5%	26.6%	3.6%	0.005

We model daily cotton serviette use while controlling for differences in the number of adults and children attending breakfast, in proportion of guests staying for the first day, being domestic, being individual leisure tourists, and staying in a superior room. We fit a Poisson regression model with a log link using cotton serviettes as dependent variable based on maximum likelihood estimation. We include an offset for the logarithm of number of adults and children to account for differences in the number of people at breakfast and to ensure that the fitted mean represents the rate of cotton serviette usage per person. The experimental condition (grey or green setting) serves as independent variable. The logarithm of number of adults and children, the proportion of children, domestic tourists, individual leisure tourists and adults staying in a superior room and interaction effects of the control variables with the experimental condition are included in the regression to avoid any bias and account for heterogeneity in the effect of the different experimental settings. We select the final model using a step-wise procedure based on the Akaike information criterion (AIC). We obtain standard errors and p values for the regression estimates based on standard asymptotic maximum likelihood theory ignoring that the data was already used for model selection.

Results

Table 2 provides Poisson regression results for daily cotton serviette use and includes estimated coefficients, standard errors, and corresponding p values. The intercept represents the grey setting. The estimated coefficient of -3.16 for the green setting indicates a reduction in cotton serviette use by 96.8%. Two control variables affect cotton serviette use regardless of the experimental setting, and two control variables affect cotton serviette used in the green setting. However, these effects are much smaller than that of the experimental setting (2.8% for domestic tourist status and 5.6% for leisure tourist status independent of the experimental condition and 19.9% for children and 15.1% for superior rooms in the green setting). A general effect of covariates can result from guests not attending breakfast, indicating that domestic and leisure tourists are more likely to skip breakfast. Covariate effects specific to the green setting indicate that guests with children and those staying in superior rooms are less likely to get a cotton serviette from the buffet.

Using this fitted model we predict cotton serviettes use in July and August for each of the settings. The grey setting would use 11,626 cotton serviettes (95% confidence interval [11,380; 11,871]). The green setting would use 491 cotton serviettes (95% confidence interval [479; 503]).

Table 2

Poisson regression results.

	Coefficient	Std. Error	p value
Offset: log(Adults + Children)	1.00	—	—
Intercept	0.05	0.02	0.003
Green setting	-3.16	0.07	< 0.001
Proportion of adults being domestic tourists	-0.03	0.01	0.05
Proportion of leisure adult guests	-0.06	0.01	< 0.001
Green setting:Proportion of children	-0.22	0.07	0.003
Green setting:Proportion of adults staying in a superior room	-0.16	0.07	0.02

Table 3 summarizes results from the guest satisfaction survey. Guests in both experimental conditions can recall equally well which serviette they received (Fisher's exact test p value = 0.8); two thirds remember correctly. Guests are equally satisfied with both kinds of serviettes. Except for one guest, all express high satisfaction. The preferred type of serviette, and the perception about the environmental friendliness of serviettes differ across experimental conditions (Fisher's exact test p values < 0.001 for both questions). This is not unexpected given the table sign used during the green setting. Under the grey setting, half of the hotel guests prefer the cotton serviette and 57% believe the cotton serviette is more environmentally friendly. Under the green setting, 16% prefer the cotton serviette and 26% believe the cotton serviette is more environmentally friendly.

Table 3

Survey results (based on 120 surveys in July and 61 in August)

Question	Answer	Grey setting		Green setting	
		Frequency	Percentage	Frequency	Percentage
Serviette provided	Cotton	79	66%	13	21%
	Paper	30	25%	41	67%
	Don't remember	11	9%	7	11%
Satisfied with serviette provided	Yes	118	98%	61	100%
	No	1	1%	0	0%
	Missing	1	1%	0	0%
Serviette preference	Cotton	60	50%	10	16%
	Paper	18	15%	17	28%
	No preference	42	35%	34	56%
Better for environment	Cotton	68	57%	16	26%
	Paper	33	28%	33	54%
	Don't know	19	16%	12	20%

In the green setting, 70% of guests state they read the table sign; 7% state they picked up a cotton serviette from the breakfast buffet at least once.

Conclusions, limitations and future work

In the four star hotel where this study was conducted, changing the grey setting (provision of cotton serviettes) to a green setting (provision of recycled paper serviettes with an option of cotton serviettes) at breakfast would reduce CO₂ emissions by 265 kilograms in July and August alone. Changing the service setting can be an effective approach to reducing negative environmental impacts from tourism without compromising in guest satisfaction. Theoretically, this finding points to an alternative pathway to triggering behavioural change in tourists, which does not rely on changing people's value systems and beliefs. Critically, this study shows that green service options do not necessarily reduce guest satisfaction; those that do not can be adopted safely by tourism business (many at reduced operational cost).

This study has limitations: we could not mirror the table sign in the grey setting due to hotel management concerns (removing the option of making paper serviettes available at the buffet). We were unable to accurately count used paper serviettes because they were mixed with general waste. These weaknesses can be addressed in replication studies. Future research should identify other environmentally unfriendly service settings and test whether changes can be made without negatively affecting guest satisfaction. Examples

include: not providing plastic straws, not providing take-away coffee cups, not providing water in plastic bottles in hotel rooms, and offering mini-bar free rooms.

References

- Barr, S., Shaw, G., & Coles, T. (2011). Times for (un)sustainability? Challenges and opportunities for developing behaviour change policy. A case-study of consumers at home and away. *Global Environmental Change*, 21(4), 1234–1244.
- Buckley, R. (2011). 20 answers: Reconciling air travel and climate change. *Annals of Tourism Research*, 38(3), 1178–1181.
- Dolnicar, S., Knezevic Cvelbar, L., & Grün, B. (2017). Do pro-environmental appeals trigger pro-environmental behavior in hotel guests? *Journal of Travel Research*, 56(8), 988-997.
- Gössling, S., Scott, D., Hall, C. M., Ceron, J. P., & Dubois, G. (2012). Consumer behaviour and demand response of tourists to climate change. *Annals of Tourism Research*, 39(1), 36–58.
- Juvan, E., & Dolnicar, S. (2014). The attitude–behaviour gap in sustainable tourism. *Annals of Tourism Research*, 48, 76–95.
- Juvan, E., & Dolnicar, S. (2016). Measuring environmentally sustainable tourist behaviour. *Annals of Tourism Research*, 59, 30–44.
- Lavelle, M. J., Rau, H., & Fahy, F. (2015). Different shades of green? Unpacking habitual and occasional pro-environmental behaviour. *Global Environmental Change*, 35, 368–378.
- Lenzen, M., Sun, Y. Y., Faturay, F., Ting, Y. P., Geschke, A., & Malik, A. (2018). The carbon footprint of global tourism. *Nature Climate Change*, 1.
- Miller, G., Rathouse, K., Scarles, C., Holmes, K., & Tribe, J. (2010) Public understanding of sustainable tourism. *Annals of Tourism Research*, 37(3), 627–645.