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Overestimating One's 'Green' Behavior: Better-Than-Average Bias May Function to Reduce Perceived Personal Threat from Climate Change

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Abstract

The actions of others, and what others approve of, can be a powerful tool for promoting pro-environmental behavior. A potential barrier to the utility of social norms, however, are cognitive biases in how people perceive themselves and others, including the better-than-average effect. This effect describes the tendency for people to think they are exceptional, especially when compared with their peers. To investigate the role of the better-than-average effect in pro-environmental behavior, we administered questions as part of a larger online survey of 5,219 nationally representative Australians. Participants were asked to report whether they engaged in a list of 21 pro-environmental behaviors, and then asked to estimate how their engagement compared with that of the average Australian. Over half of our participants self-enhanced; they overestimated their engagement in pro-environmental behaviors relative to others. Self-enhancement was related to reduced perceptions of personal harm from climate change, more favourable assessments of coping ability, less guilt, and lower moral and ethical duty to take action to prevent climate change. These relationships held when participants sceptical about anthropogenic climate change were removed from analyses. We discuss the implications of the findings for the use of social norms in promoting pro-environmental behavior.

Keywords: Better-than-average effect; uniqueness bias; pro-environmental behavior; social norms; climate change

Overestimating One's 'Green' Behavior: Better-Than-Average Bias May Function to Reduce Perceived Personal Threat from Climate Change

People's behavioral responses to contested social issues are shaped by their attitudes, and climate change is no exception (Corner, Markowitz, & Pidgeon, 2014; Hornsey, Harris, Bain, & Fielding, 2016). In turn, people's attitudes are shaped in part by perceptions of what others think and do (Tankard & Paluck, 2016). These perceptions are often subject to distortion, both from 'external' sources, such as media representations of an issue (Boykoff, 2014), and 'internal' psychological processes (Ross, Greene, & House, 1977; Shamir & Shamir, 1997). Such distortions operate in the perception of community opinion about climate change, whereby people tend to overestimate levels of scepticism in the broader community (Leviston, Walker, & Morwinski, 2013). Similar research suggests people underestimate how much others care about the environment, and overestimate the stigma associated with acting environmentally (Bouman & Steg, 2019; Klas, Zinkiewicz, Zhou, & Clarke, 2018). In the current research, we investigate whether misperceptions about what others think in relation to climate change extends to misperceptions about what others are doing to combat climate change, relative to one's own actions. Specifically, we investigate whether a cognitive bias – the better-than-average effect – operates in the domain of pro-environmental behavior, investigate its possible functions, and explore the implications of its presence for appealing to environmental norms.

The 'better-than-average effect' (Alicke, 1985) describes the tendency for people to think of themselves as exceptional, especially in relation to their peers (Brown, 2012). This effect, also termed self-enhancement bias, uniqueness bias, or illusory superiority, manifests in the tendency for people to think of themselves as more virtuous and moral, more compassionate and understanding, and (paradoxically) as less biased than their average human counterpart (Brown, 2012; Dunning, Heath, & Suls, 2004; Pronin, Gilovich, & Ross,

2004). The effect extends to generous self-assessments of one's skill and capability in specific situations. In a classic example, US and Swedish students were asked to assess their own driving ability relative to peers; 88% of US participants and 77% of Swedish participants considered themselves to be safer than the average driver (Svenson, 1981). More recently, the effect has been found to operate in self-other assessments of leadership abilities (Foster, Clarke, & Packard Jr, 2018), intelligence (Heck, Simons, & Chabris, 2018), and prejudice (Howell & Ratliff, 2017). In this latter study, people generally believed they were less prejudiced than others and, when given feedback about their apparent bias, responded defensively. Defensive responding was most pronounced for those initially believing they were better-than-average (in this case, less prejudiced).

One explanation for the better-than-average effect stems from a cognitive perspective. People use themselves as reference points, as they are most privy to their own behaviors, thoughts, and capabilities. This reference point acts as an anchor from which people insufficiently adjust, as they lack the informational database about other people's behaviors, thoughts, skills, and capabilities (Kruger, 1999). Building upon this cognitive perspective, others (e.g., Brown, 2012) have stressed the role of motivational forces in shaping inaccuracies, such as a desire to enhance and maintain feelings of self-worth; it makes people feel good to believe they are above average. Thus, people have a tendency to seek out comparisons that are self-exonerating. Critically, these 'downward social comparisons' are more likely to be made when the individual wants to reduce threat and enhance the self (Woods, 1989).

If the better-than-average effect performs important functions for self-esteem maintenance, we would expect the effect to manifest in the context of self-other assessments of pro-environmental behavior. Information about climate change has been demonstrated to induce threat, feelings of helplessness, guilt, and reduced efficacy, which can in turn trigger

defensive or compensatory reactions in an effort to reduce negative emotions and feelings of personal culpability (Kellstedt, Zahran, & Vedlitz, 2008; Witte & Allen, 2000). Moreover, making climate change proximal or salient does not necessarily translate to increased pro-environmental behavioral engagement, and other strategies are often employed to deal with the unpleasant feelings aroused by climate change, including bolstered efficacy beliefs (Brügger, Dessai, Devine-Wright, Morton, & Pidgeon, 2015; Hornsey et al., 2015). Brügger et al. (2015) suggest that climate change information may not only influence risk and efficacy perceptions, but also threaten psychological resources such as positive self-worth, especially under conditions where individuals' potential role in contributing to climate change is made salient. Accordingly, we propose that climate change provides the necessary motivational impetus to reduce negative emotions through a self-exonerating process; specifically, through proclamations that people are doing their fair share or more than others. These self-other assessments may in turn license the individual to continue pursuing less climate-friendly behaviors (e.g., driving a motor vehicle, eating meat), reduce threat and negative affect, and bolster efficacy beliefs associated with climate change and its impacts.

The implications of better-than-average effects, if found to operate in this context, are important for social normative communication. Not only might distortions about one's own environmental performance relative to others excuse poorer subsequent behaviors via moral licensing, but it may also render community-level social normative messaging designed to appeal to poor performers ineffective.

The Current Study

We suggest that the better-than-average effect will operate in the context of pro-environmental behaviors, such that:

1) people will tend to perceive themselves as making greater behavioral contributions than others make;

2) distorted perceptions of one's own behavior relative to others will be associated with feelings of threat from climate change, as measured by climate change causation belief, perceived harm from climate change, and perceived ability to cope with the impacts of climate change;
3) distorted perceptions will be associated with levels of climate-related guilt and moral and ethical duty to respond to climate change;
4) distorted perceptions will be associated with separate assessments of perceived social norms, such that those who think they are better-than-average will be
    a. less likely to think those around them perform many pro-environmental behaviors (descriptive norm); and,
    b. more likely to think those around them think they *should* engage in pro-environmental behavior (injunctive norm)

Method

Participants and Procedure

Survey items testing the better-than-average effect were administered as part of a larger five-part longitudinal survey run by Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) tracking attitudes to climate change. Reporting of the main descriptive results from these five surveys is available at Leviston, Greenhill, and Walker (2015). For the current study, undertaken as the fourth in the series of five surveys, a total of 5,219 Australians completed the survey online. Participants were recruited from an online survey panel managed by The Online Research Unit and were representative of the national population across major demographics based on Australian Census data (Table 1). Participants' spread of ages approximated that of the Australian population, and roughly equal proportions of females (51.4%) and males (48.6%) completed the survey. Participants came from a diverse range of locations, consistent with the spread of the Australian

population, with 57.6% of participants residing in capital cities, 27.1% in regional areas, and 12.4% in rural areas.

Measures

Pro-environmental behavior index. Participants were asked about their engagement in each of 21 actions with significance for the reduction of greenhouse gas emissions. For each behavior, participants were asked if to indicate whether they performed each action, with the following response options for each item: 'yes, mostly for environmental reasons', 'yes, mostly for other reasons', and 'I don't do this'. Responses of "yes" (either for environmental or for other reasons) were summed to create an overall behavior index, with possible index scores ranging from zero to 21. See Table 2 for a full list of these behaviors and the percentage of participants who reported engaging in each one (either for environmental or for other reasons).

Estimated behavior. Participants were then asked to think about the behaviors as a whole in the previous question and indicate whether they thought they did much more, did a bit more, did about the same, did a bit less, or did a lot less than the average Australian. Participants selected the category that best described their estimate.

Climate change beliefs. Participants were asked to select one of four statements that best described their thoughts on climate change. The four statements were*:* I don't think that climate change is happening; I have no idea whether climate change is happening or not; I think that climate change is happening, but it's just a natural fluctuation in Earth's temperatures; I think that climate change is happening, and I think that humans are largely causing it.

Perceived harm from climate change. Participants indicated how much they thought climate change would harm them personally on a scale from 1 (*not at all*) to 4 (*a great deal*).

Perceived ability to cope with climate change. Participants indicated the extent to which they thought they would be able to cope with the impacts of climate change financially, physically, mentally, and overall. Responses to the four items were recorded on a scale from 1 (*Not cope at all*) to 5 (*Cope perfectly*) and were averaged to form a single index of perceived ability to cope ($\alpha = .91$).

Moral and ethical duty. Moral and ethical duty to respond to climate change was measured with two items (i.e., I feel a moral duty to do something about climate change; I feel it is my ethical responsibility to change my individual behavior to combat climate change). Reponses were recorded on a scale from 1 (*Strongly disagree*) to 5 (*Strongly agree*) and were averaged to form a single index ($\alpha = .78$).

Guilt. Participants indicated the extent to which they agreed or disagreed that the issue of climate change made them feel guilty on a scale from 1 (*Strongly disagree*) to 5 (*Strongly agree*).

Descriptive and injunctive norms. Descriptive norms were measured with four items assessing the extent to which participants agreed or disagreed that most people in their social network, family, and community, and most people who were important to them did many of these behaviors. Injunctive norms were measured with four items assessing the extent to which participants agreed or disagreed that most people in their social network, family, and community, and most people who were important to them thought they (i.e., participants) should do many of these behaviors. Responses to both sets of items were recorded on a scale from 1 (*Strongly disagree*) to 5 (Strongly agree). Responses were averaged; Cronbach's alphas were .84 and .92 for descriptive and injunctive norms, respectively.

Results

Pro-environmental behavior index scores spanned the full range from 0 to 21 and were normally distributed, with a slightly peaked clustering in the center (M = 11.89, SD = 4.44; skewness = .06, kurtosis = .19).

Just over half of participants (52.1%) responded they did about the same as the average Australian. A small percentage of participants thought they did a bit less (5.0%) or a lot less (1.3%) than the average Australian. By contrast, a third (33.6%) thought they did a bit more, and a further 8.0% thought they did a lot more than the average Australian.

As an initial test of the relationship between participants' behavior index scores and self-other assessments, we performed a median split based on pro-environmental behavior index scores. For those who scored below the median, fewer than 10% considered their own behavioral engagement as lower than the average person's, while 26.7% considered their engagement to be higher, which contrasts with 3.4% and 55.2% for participants who scored above the median on self-reported behavior.

To probe these relationships further, we then split participants into five roughly even groups on the basis of their reported behavior relative to the behavior of other participants in the survey (much less than other participants, a bit less, about the same, a bit more, and a lot more). Participants' behavioral index scores were then cross-tabulated with their estimated behavior relative to the average Australian (i.e., their selection of 'much less', 'a bit less', 'about the same', 'a bit more', and 'a lot more'). Table 3 shows the percentage of survey participants who fell within each cross-tabulated cell. The shading in each cell indicate three different patterns of estimation of one's own performance relative to others: accurate (light grey cells), self-deprecating (white cells), or self-enhancing (dark grey cells). Just under one-quarter (21.5%) were deemed to be accurate assessors: given their self-reported behavior, their assessment of where they stood in relation to others was reasonably accurate. The same

number (21.5%) were deemed to be self-deprecating: they undervalued their comparative performance. Over half of participants (57.1%) were deemed to be self-enhancing: they tended to overestimate their performance in relation to others.[1]

Chi-square analysis revealed that patterns of self-assessment were significantly related to beliefs about climate change, though the effect size was small, χ^2 (6, n = 5219) = 85.72, $p < .001$, Cramer's $V = .09$ (see Table 4). Self-enhancers were the most prevalent group regardless of belief type, although they were slightly more populous among those who thought climate change was not happening or was due to natural causes. Interestingly, those who did not know about the causes of climate change had the greatest proportion of self-deprecators, although they represented a relatively small proportion of the overall sample.

One-way ANOVAs revealed that those deemed self-enhancers scored significantly lower on perceived personal harm from climate change, reported greater ability to cope (though the effect size was small), reported less guilt, and lower moral and ethical duty to respond to climate change, than did accurate assessors and self-deprecators. Accurate assessors and self-deprecators differed only on levels of guilt, which was highest for self-deprecators (see Table 5).

In line with expectations, self-enhancers were less likely than accurate assessors and self-deprecators to think those around them performed many of those behaviors. Contrary to our expectations, self-enhancers were also less likely to think that others thought they *ought to* perform those behaviors (Table 5).[2]

[1] The term 'self-enhancing' in the current context refers to the motivational tendency to self-enhance, and is distinct from the 'self-enhancement' value dimension in Schwartz (2012) and others' human values work.

[2] Although beliefs about climate change causation can be considered a dimension of threat reduction, we repeated our analyses with only those who accepted anthropogenic climate change (n = 2470) to control for variance attributable to climate change scepticism. Our initial findings were replicated, although with slightly reduced effect sizes for harm, guilt, moral and ethical duty, and descriptive norms.

Discussion

The majority of our participants evidenced better-than-average tendencies. Our findings are consistent with previous literature from other domains (e.g., Heck et al., 2018; Howell & Ratliff, 2017; Svenson, 1981) and provide good initial evidence that better-than-average effects operate in the domain of pro-environmental behavior. The bias was not restricted to people who performed poorly, or to those holding certain beliefs about climate change, but was evident across a spectrum of behavior and attitudes. Moreover, distorted perceptions about one's own behavior was related to factors such as moral and ethical duty to respond to climate change, climate-related guilt, coping appraisals, and descriptive and injunctive norms. In each case we found that a self-other comparison that flattered the participant tended to be accompanied by attitudes that function to reduce threats posed by climate change and reduce personal culpability. Taken together, the results suggest better-than-average effects might serve a palliative function for the individual.

The tendency for self-enhancers to downgrade personal perceived harm from climate change and bolster personal coping ability relative to other groups might also be understood as optimism bias – the belief that negative events are more likely to happen to others than to oneself (Radcliffe & Klein, 2002). This form of bias is itself functional, as it aids in restoring feelings of efficacy and control. Coupled with findings that self-enhancers reported lower feelings of guilt and moral and ethical duty, it is arguable that better-than-average assessments are not necessarily causative but one of an interrelated set of motivated cognitions to reduce both internal and external threat (Hornsey et al., 2015).

Motivations to self-enhance may also have interpersonal underpinnings and benefits. For instance, Kurz, Prosser, Rabinovich, and O'Neill (2020) argue that tightly defined behaviors, such as veganism and cycling, implicitly signal moral judgments to those who do not partake in these behaviors. Our list of pro-environmental behaviors included both loosely

and tightly specified behaviors. In order to restore moral worth, it is feasible that those whose inaction is made salient in specific behavioral areas become motivated to make downward social comparisons ('I may not be perfect, but I'm better than most'). Self-enhancement may thus have a moral licensing effect (Mazar & Zhong, 2010; Merritt, Effron, & Monin, 2010), allowing the assessor to concurrently admit to unstainable behaviors (driving a motor vehicle, regularly eating meat) while maintaining moral standing within the broader community. Further research might test whether better-than-average effects are heightened under conditions where indicating high behavioral engagement is made more difficult. Similarly, future research employing longitudinal or experimental designs might illuminate whether self-other assessments are dynamic or whether they reflect more general chronic predispositions toward bias.

Implications for Environmental Communication

The findings have several important implications for communicators seeking to harness social norms to generate greater uptake of environmentally friendly behavior. First, the effectiveness of broad appeals based on descriptive norms is likely to be diluted if the targets of such campaigns are unaware that their own behavior ranks poorly in relation to the actual norm. Self-enhancers are unlikely to realise that they are self-enhancing, and downward social comparisons may perpetuate behavioral disengagement through misconstrued norms.

In order for people to accurately estimate their relative environmental contribution, it is critical they are exposed to accurate information on what others do. This could be achieved by increasing the visibility of pro-environmental behaviors. A successful example of this is the use of feedback through utility bills, whereby households are compared with other similar households in the neighbourhood (Allcott & Mullainathan, 2010). A caveat is that normative communication might also have unintended impacts for people we classified in this study as

self-deprecators. Previous research has shown that providing accurate descriptive norms to good performers should be done with caution, as it can result in rebound effects as people revise their behavior to more closely align to the newly learned descriptive norm (Allcott, 2011; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Conversely, presenting self-deprecators with normative information that reveals their relatively good behavior may have peculiarly beneficial effects for those low in environmental identity; reminding people of their own pro-environmental behavior has indeed been found to foster a sense of environmental identity, which in turn may translate into a heightened injunctive imperative to sustain one's actions (Bem, 1972; van der Werff, Steg, & Keizer, 2014).

While we anticipated self-enhancers would tend to think those around them performed relatively fewer behaviors, we did not anticipate the discounted assessment of what they believed others *thought* they should do. This suggests that downward, or self-exonerating comparisons, extend beyond beliefs about what others do, to beliefs about what others think. More practically, it suggests that, in addition to providing people with accurate information about what others *do,* accurate feedback concerning what others *think* is equally important. An emerging line of research suggests people overestimate levels of anti-environmentalism and stigma attached to certain environmental behaviors (e.g., Klas et al., 2018). Assuring people of emerging injunctive norms of environmentalism, that increasingly people are 'on board' with combating climate change, are likely to be important in combatting tendencies to overestimate the stigma attached to environmental behaviors. Again though, as Kurz et al. (2020) note, the highly moralised nature of certain behaviors can lead to negative emotions such as moral outrage among those who do not engage in the behaviors. Hence messaging of injunctive norms should also proceed with caution.

Finally, we acknowledge the complicating role of environmental identities in the persuasiveness of communication leveraging descriptive and injunctive norms (e.g.,

Göckeritz et al., 2010; Kantola, Syme, & Campbell, 1984; Schultz et al., 2016). We suggest research in these traditions extend to encompass interactions with self-other assessments, to arrive at more universally effective pro-environmental messaging.

Limitations and Future Directions

Several limitations of the current research should be acknowledged. First, the data are cross-sectional; hence causality can only be implied. Longitudinal and experimental designs are necessary to uncover the precise mechanisms through which better-than-average biases operate, whether they can be mitigated, and whether they have certain antecedents, most notably environmental (and other) identities.

Second, as previously mentioned, the pro-environmental behaviors investigated here comprised a mix of loosely specified and more concrete behaviors. Self-reported loosely specified behaviors (e.g., 'usually' fixing things rather than replacing them, 'changing' one's gardening practices) are arguably more prone to socially desirable responding than more concrete behaviors (e.g., installing a rainwater tank or insulation). The possibility that, by including loosely specified behaviors, subsequent advantageous self-other assessments were primed or bolstered cannot be discounted. We suggest future research counterbalance the measurement of one's own behavioral engagement and self-other assessments to investigate any influence of social desirability bias on better-than-average assessments. Such research might also investigate patterns of self-other assessments for specific groupings of behavior; for example, are better-than-average effects attenuated for concrete behaviors, and might such attenuation have its own unique consequences for subsequent self-other assessments for loosely specified behaviors?

Third, we acknowledge that a significant minority of participants in the current study (43%) did not evidence clear better-than-average effects in the domain of pro-environmental behavior. Stronger evidence for the effect has been shown elsewhere, for instance, 77-88% of

respondents in Svenson's (1981) driving self-assessments showed better-than-average effects, and 65% showed better-than-average effects in Heck et al.'s (2018) self-assessments of intelligence. This runs somewhat counter to theoretical assumptions that uniqueness bias is a general and universal tendency, although the current findings might be partially attributable to the lack of granularity in our estimated behavior measure[3]. Further research, including cross-cultural research, might investigate whether those who self-enhance (or self-deprecate) in an environmental domain show similar propensities in other behavioral domains. The precise role of environmental identity would be particularly pertinent to such cross-domain investigations.

Conclusion

We investigated better-than-average effects on a large, nationally representative sample, something which is often lacking in sustainable consumption research (Richardson, Ginn, Prosser, Fernando, & Judge, 2020), and which allowed us to test distorted perceptions against a representative baseline of reported behaviors.

We suggest a more targeted approach to normative messaging is warranted—one that acknowledges the pervasive role of the better-than-average effect in people's assessments of their pro-environmental behavior. Such an approach would account for interrelationships between the effects of descriptive and injunctive normative messaging, environmental identity, and, critically, the accuracy of people's perceptions of their own behavior relative to others.

[3] Many studies testing better-than-average effects do not allow respondents to indicate that they are average, or about average, and force an enhancing or deprecating response (e.g., Heck, Simons, & Chabris, 2018). Other studies employ response scales measured at finer levels, such as from 1 to 100 (Dunning, Heath, & Suls, 2004). Both these methods may increase the likelihood that respondents make, or are deemed to have made, a self-enhancing assessment.

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Table 1

Demographic Characteristics of Participants

Demographic	Category	% of Participants	Australian Population %
Age	<24	7.3	10.7
	25–34	15.7	18.3
	35–44	16.0	18.9
	45–54	16.7	18.2
	55–64	20.3	15.4
	65–74	19.0	10.0
	75+	5.0	8.5
Gender	Male	48.6	49.4
	Female	51.4	50.6
Location	Capital city	57.6	65.2 (capital city)
	Regional town	27.1	17.4 (significant urban area)
	Rural area	12.4	17.4 (other)

Note. $N = 5219$.

Table 2

Percentage of Participants Reporting Engagement in Pro-environmental Behaviors

Behavior	% of Participants
I switch lights off around the house whenever possible	95.3
I have reduced the amount of water I use around the house and garden	88.7
I will usually try to fix things rather than replace them	88.4
I have reduced the amount of gas and/or electricity I use around the hous	87.2
Where possible, I buy products that are made locally	83.3
I recycle/ compost as much household waste as possible	81.7
Most of my cleaning products are environmentally friendly	76.8
I have switched to products that are more environmentally friendly	75.2
I have reduced the amount of petrol I use	70.3
I have installed insulation in my home	62.4
I usually walk/cycle/carpool/take public transport	59.9
I have changed my gardening practices	52.3
I have reduced my amount of air travel	41.9
I have installed a rain water tank on my property	40.4
I have changed my diet	37.6
I have installed a solar hot water system, or solar panels, in my house	37.0
I am on Green Power electricity	32.2
I have installed a grey water recycling system on my property	21.0
I buy carbon-offsets to reduce my carbon footprint	20.4
I have taken part in a political campaign about an environmental issue	18.9
I have contacted a government member about climate change	18.0

Table 3

Self-reported Versus Estimates of Self Relative to Others' Pro-Environmental Behavior

		Self-reported Behavior (%)					
		1. Much less behavior	2. A little less behavior	3. About the same behavior	4. A little more behavior	5. Much more behavior	**Total (%)**
Estimated Self Relative to Others' Behavior (%)	1. Do much more than the average Australian	0.6	1.3	1.4	1.9	2.9	**8.0**
	2. Do a bit more than the average Australian	2.6	8.2	8.3	6.9	7.6	**33.6**
	3. Do about the same as the average Australian	13.7	16.7	9.7	4.9	7.1	**52.1**
	4. Do a bit less than the average Australian	2.4	1.3	0.7	0.3	0.2	**5.0**
	5. Do a lot less than the average Australian	0.7	0.2	0.0	0.1	0.4	**1.3**
Total (%)		**20.0**	**27.6**	**20.0**	**14.1**	**18.2**	**100.0**

Note. N = 5219. Light grey cells are accurate estimators; white cells are self-deprecators; dark grey cells are self-enhancers.

Table 4

Self-other Assessments by Belief in Climate Change Causation

Climate change belief	Self-Enhancers	Accurate Assessors	Self-Deprecators
Not happening (*n* = 397)	62.7%	17.9%	19.4%
Don't know (*n* = 329)	52.0%	12.2%	35.9%
Happening, but natural (*n* = 2023)	61.4%	20.0%	18.6%
Happening and human induced (*n* = 2470)	53.1%	24.4%	22.5%

Table 5

Means, Standard Deviation and One-way ANOVA Results Comparing Self-Enhancers, Accurate Assessors, and Self-deprecators

	All participants	Self-enhancers	Accurate assessors	Self-deprecators	
Perceived Harm	2.39 (0.93)	2.24 (0.93)$_{a}$	2.55 (0.91)$_{b}$	2.64 (.87)$_{b}$	$F(2, 4841) = 94.90$, $p < .001$, $\eta^2 = .04$
Perceived Coping	3.32 (0.90)	3.41 (0.90)$_{a}$	3.24 (0.91)$_{b}$	3.17 (0.84)$_{b}$	$F(2, 5216) = 37.03$, $p < .001$, $\eta^2 = .01$
Guilt	2.79 (1.03)	2.64 (1.04)$_{a}$	2.92 (1.04)$_{b}$	3.04 (0.95)$_{c}$	$F(2, 5216) = 73.63$, $p < .001$, $\eta^2 = .03$
Moral and Ethical duty	3.44 (0.95)	3.92 (0.99)$_{a}$	3.64 (0.89)$_{b}$	3.61 (0.95)$_{b}$	$F(2, 5216) = 83.94$, $p < .001$, $\eta^2 = .03$
Injunctive norms	3.02 (0.77)	2.91 (0.77)$_{a}$	3.12 (0.76)$_{b}$	3.24 (0.69)$_{c}$	$F(2, 5216) = 89.00$, $p < .001$, $\eta^2 = .03$
Descriptive norms	3.22 (0.72)	3.11 (0.72)$_{a}$	3.35 (0.71)$_{b}$	3.40 (0.72)$_{b}$	$F(2, 5216) = 92.29$, $p < .001$, $\eta^2 = .03$

Note. Mean scores with different subscripts are significantly different on the basis of Tukey's HSD test.

Author Biographies

ZOE LEVISTON has a PhD in Psychology from Curtin University and is a Post Doctoral Research Fellow at Edith Cowan University, located in Perth, Australia. Her research applies social psychological theory to investigate how individuals, groups, and culture shape people's responses to social and natural resource challenges, including climate change, immigration, and resource consumption. She has previously worked as a social research scientist for the Commonwealth Scientific and Industrial Research Organisation (CSIRO) from 2004 to 2017.

HANNAH UREN is a PhD Candidate at Curtin University in Perth, Australia. Her research focuses on understanding the social and psychological determinants of pro-environmental behavior in an effort to develop better communication and behavior change strategies to promote environmental sustainability. She is particularly interested in the roles of identity, norms and social status on the pro-environmental action.