

Supplementary data

Table 1S

Psychometric Features of Two Environmental Attitude Measures Calibrated with the Partial Credit Rasch Model

	Basic model	Full model
ITEM FIT STATISTICS:		
<i>M(MS)</i>	1.00	1.00
<i>SD(MS)</i>	0.09	0.09
<i>Minimum (MS)</i>	0.83	0.85
<i>Maximum (MS)</i>	1.19	1.26
PERSON FIT STATISTICS:		
<i>M(MS)</i>	1.02	1.01
<i>SD(MS)</i>	0.39	0.37
<i>% people with poor fit ($t \geq 1.96$)</i>	7.65%	7.10%
<i>Separation reliability</i>	.80	.82

Note. The *basic* model was based on 32 pentanary (5-digits: 0-4) and 18 binary-coded behavioral self-reports (see also Table 2S). The *full* model was based on the same 50 pentanary and binary-coded behavioral self-reports and the 6 pentanary manifest pro-environmental behaviors from the PEBT. For the PEBT items, pro-environmental engagement was coded from zero up to four bicycle choices out of four such opportunities with a specific waiting time.

Table 2S

The 50 Self-Reports of the General Ecological Behavior Scale Ordered as in Table 1A in the Appendix

	BEHAVIORAL SELF-REPORTS	δ	MS_w	MS_u	t_w	t_u
1.	I buy domestically grown wooden furniture.	1.25 (.13)	0.99	0.96	0.0	-0.2
2.	I contribute financially to environmental organizations.	1.46 (.10)	0.93	0.97	-0.4	-0.1
3.	I drive on freeways at speeds under 100 kph (= 62.5 mph).	0.83 (.11)	1.09	1.09	0.6	0.5
4.	I am a member of an environmental organization.	2.55 (.26)	0.92	0.80	-0.4	-0.8
5.	I boycott companies with an unecological background.	1.13 (.08)	0.83	0.78	-1.6	-1.7
6.	I am a vegetarian.	2.16 (.22)	0.95	0.89	-0.3	-0.5
7.	I am a member of a carpool.	1.91 (.23)	1.02	1.02	0.2	0.2
8.	I buy meat and produce with eco-labels.	0.47 (.08)	0.91	0.90	-0.8	-0.7
9.	I buy products in refillable packages.	0.57 (.08)	0.97	0.97	-0.2	-0.2
10.	I own solar panels.	1.59 (.20)	1.03	1.08	0.3	0.6
11.	<i>At red traffic lights, I keep the engine running.</i>	0.74 (.08)	1.07	1.08	0.6	0.5
12.	<i>I buy convenience foods.</i>	0.43 (.09)	1.07	1.07	0.7	0.6
13.	I have a contract for renewable energy with my energy provider.	1.31 (.24)	0.92	0.89	-0.7	-0.6
14.	<i>For longer journeys (more than 6 hours of travel time by car), I take an airplane.</i>	0.50 (.07)	1.16	1.16	1.7	1.4
15.	I buy beverages and other liquids in returnable bottles.	0.36 (.07)	0.95	0.95	-0.5	-0.4
16.	I have pointed out unecological behavior to someone.	0.19 (.07)	0.91	0.92	-0.9	-0.7
17.	<i>I use a clothes dryer.</i>	0.25 (.06)	1.19	1.28	2.2	2.1
18.	I talk with friends about environmental pollution, climate change, and/or energy consumption.	-0.05 (.07)	0.88	0.88	-1.3	-1.0

continued

BEHAVIORAL SELF-REPORTS		δ	MS_w	MS_u	t_w	t_u
19.	I read about environmental issues.	-0.31 (.08)	0.86	0.85	-1.6	-1.3
20.	I refrain from owning a car.	0.66 (.19)	0.98	0.98	-0.3	-0.1
21.	<i>I keep the engine running while waiting in front of a railroad crossing or in a traffic jam.</i>	0.29 (.08)	0.88	0.86	-1.2	-1.0
22.	I own a fuel-efficient automobile (less than 6 liters per 100 kilometers).	0.67 (.23)	0.93	0.92	-1.1	-0.6
23.	I have looked into the pros and cons of having a private source of solar power.	0.67 (.18)	0.89	0.89	-2.3	-1.1
24.	<i>I use fabric softener with my laundry.</i>	0.65 (.17)	1.00	1.00	-0.1	0.0
25.	<i>If I am offered a plastic bag in a store, I take it.</i>	0.12 (.06)	0.84	0.86	-1.8	-1.2
26.	<i>I drive to where I want to start my hikes.</i>	-0.17 (.10)	1.15	1.17	1.2	1.1
27.	<i>I buy beverages in cans.</i>	-0.05 (.08)	1.07	1.07	0.7	0.6
28.	<i>In the winter, I keep the heat on so that I do not have to wear a sweater.</i>	0.00 (.15)	0.94	0.94	-1.7	-0.7
29.	I collect and recycle used paper.	-0.16 (.06)	0.94	0.96	-0.7	-0.3
30.	I drive in such a way as to keep my fuel consumption as low as possible.	-0.13 (.20)	0.88	0.86	-2.5	-1.3
31.	I own an energy efficient dishwasher (efficiency class A+ or better).	-0.20 (.22)	0.96	0.95	-0.7	-0.4
32.	I buy seasonal produce.	-0.33 (.08)	1.00	0.97	0.0	-0.2
33.	<i>I drive my car in or into the city.</i>	-0.46 (.10)	1.08	1.10	0.6	0.6
34.	<i>I buy bleached or colored toilet paper.</i>	-0.30 (.07)	1.16	1.36	1.4	2.2
35.	In nearby areas (around 30 kilometers; around 20 miles), I use public transportation or ride a bike.	-0.92 (.08)	1.11	1.10	1.2	0.8
36.	In winter, I turn down the heat when I leave my apartment/house for more than 4 hours.	-0.31 (.06)	1.06	1.34	0.6	2.1
37.	I wash dirty clothes without prewashing.	-0.32 (.07)	1.17	1.30	1.5	1.7

continued

	BEHAVIORAL SELF-REPORTS	δ	MS_w	MS_u	t_w	t_u
38.	<i>I use a chemical air freshener in my bathroom.</i>	-0.69 (.17)	0.99	0.96	-0.1	-0.4
39.	I bring empty bottles to a recycling bin.	-0.28 (.06)	1.03	0.89	0.3	-0.6
40.	<i>I kill insects with a chemical insecticide.</i>	-0.42 (.07)	1.05	1.01	0.4	0.1
41.	<i>In hotels, I have the towels changed daily.</i>	-0.87 (.18)	0.94	0.91	-0.6	-0.7
42.	<i>I use an oven cleaning spray to clean my oven.</i>	-0.75 (.09)	1.01	1.16	0.1	1.0
43.	<i>In the winter, I air rooms while keeping the heat on and leaving the windows open, simultaneously.</i>	-0.78 (.08)	1.04	1.01	0.4	0.2
44.	<i>I put dead batteries in the garbage.</i>	-1.60 (.22)	0.99	0.95	0.0	-0.2
45.	I shower (rather than take a bath).	-0.99 (.09)	1.09	2.17	0.6	3.6
46.	<i>After meals, I dispose of leftovers in the toilet.</i>	-2.24 (.28)	0.96	.81	-0.1	-0.7
47.	I wait until I have a full load before doing my laundry.	-1.06 (.12)	1.02	0.99	0.2	0.0
48.	After a picnic, I leave the place as clean as it was originally.	-2.60 (.33)	0.99	0.88	0.1	-0.3
49.	I ride a bicycle, walk, or take public transportation to work or school.	-1.23 (.16)	1.05	2.46	0.2	2.6
50.	I reuse my shopping bags.	-3.54 (.51)	1.00	0.91	0.2	0.0

Note. Self-reports in italics indicate negatively formulated behaviors; they are recoded and should be read as "I refrain from" Cost estimates (δ) are expressed in logits. For the polytomous items, only the overall cost estimate of an item is reported but step estimates are not. Mean square (MS) and t values—unweighted ($_u$) and weighted ($_w$) by the item variance—reflect the relative discrepancy between the model predictions and the observed data and were thus used to assess item fit (see, e.g., Wright & Masters, 1982). **Bold figures** highlight either statistically significant t values ($p < .05$) or MS_w values that did not fall within an acceptable range of fit for test items ($0.80 \leq MS \leq 1.20$) and MS_u values that did not fall within an acceptable range of fit for typical survey items ($0.60 \leq MS \leq 1.40$; see Wright et al., 1994). A value of $MS > 1.20$ corresponds to an excess of more than 20% variation in the model's prediction compared with what was in the data.

Table 3S

The 32 Polytomous GEB Items of Table 1A in the Appendix and 6 Polytomous PEBT Items

	BEHAVIORAL SELF-REPORTS	δ_1	δ_2	δ_3	δ_4
1.	I buy domestically grown wooden furniture.	.39	1.14	2.17	
2.	I contribute financially to environmental organizations.	.81	1.92	1.24	1.84
3.	I drive on freeways at speeds under 100 kph (= 62.5 mph).	-.57	1.32	1.95	.54
5.	I boycott companies with an unecological background.	.59	.73	1.37	1.82
8.	I buy meat and produce with eco-labels.	-.97	.35	1.60	.95
9.	I buy products in refillable packages.	-1.10	.10	1.25	2.09
11.	<i>At red traffic lights, I keep the engine running.</i>	.55	1.06	.20	1.13
12.	<i>I buy convenience foods.</i>	-1.25	-.34	1.04	2.35
14.	<i>For longer journeys (more than 6 hours of travel time by car), I take an airplane.</i>	-.06	-.31	.70	1.75
15.	I buy beverages and other liquids in returnable bottles.	-.47	.26	.51	1.22
16.	I have pointed out unecological behavior to someone.	-.67	-.44	.82	1.12
17.	<i>I use a clothes dryer.</i>	-.04	.65	.54	-.08
18.	I talk with friends about environmental pollution, climate change, and/or energy consumption.	-1.06	-.59	.89	.66
19.	I read about environmental issues.	-2.06	-.53	.92	.54
21.	<i>I keep the engine running while waiting in front of a railroad crossing or in a traffic jam.</i>	-.21	.49	.02	.90
25.	<i>If I am offered a plastic bag in a store, I take it.</i>	.09	-.65	.26	.91
26.	<i>I drive to where I want to start my hikes.</i>	-1.71	-.13	-.05	1.26
27.	<i>I buy beverages in cans.</i>	-.90	-.51	-.13	1.47
29.	I collect and recycle used paper.	-.24	-.23	.10	-.13
32.	I buy seasonal produce.	-1.05	-1.00	-.20	1.04
33.	<i>I drive my car in or into the city.</i>	-1.56	-.77	-.29	.87
34.	<i>I buy bleached or colored toilet paper.</i>	.21	-.99	.10	-.41
35.	In nearby areas (around 30 kilometers; around 20 miles), I use public transportation or ride a bike.	-2.52	-1.04	-.03	.04
36.	In winter, I turn down the heat when I leave my apartment/house for more than 4 hours.	-.21	.07	-.24	-.72
37.	I wash dirty clothes without prewashing.	-.47	.26	-.39	-.53
39.	I bring empty bottles to a recycling bin.	.03	.64	-1.11	-.53
40.	<i>I kill insects with a chemical insecticide.</i>	-.30	-.52	-.56	-.17

continued

BEHAVIORAL SELF-REPORTS		δ_1	δ_2	δ_3	δ_4
42.	<i>I use an oven cleaning spray to clean my oven.</i>	-1.68	-.44	-.43	-.32
43.	<i>In the winter, I air rooms while keeping the heat on and leaving the windows open, simultaneously.</i>	-1.69	-.75	-.71	.16
45.	I shower (rather than take a bath).	-1.43	-.27	-.33	-1.78
47.	I wait until I have a full load before doing my laundry.	-.03	-1.84	-1.60	-.63
49.	I ride a bicycle, walk, or take public transportation to work or school.	-.12	-.69	-1.73	-2.25
1.	Bike use with an extra waiting time of 5 s	-.12	-.69	-1.87	-2.11
2.	Bike use with an extra waiting time of 10 s	-.51	-.17	-.66	-1.48
3.	Bike use with an extra waiting time of 15 s	.21	-.20	-.13	-.84
4.	Bike use with an extra waiting time of 20 s	.82	-.23	.55	-.78
5.	Bike use with an extra waiting time of 30 s	.82	1.08	.10	-.60
6.	Bike use with an extra waiting time of 60 s	1.79	.31	1.50	-.83

Note. *Self-reports in italics* indicate negatively formulated behaviors; they are recoded and should be read as "I refrain from" Cost estimates (δ) are expressed in logits. With a 5-step frequency scale, there are 4 cost estimates per item. **Bold figures** highlight cost estimates within items that violate the partial credit-presumed response order from (0 = never to 4 = very often/4 times).

Table 4S

Descriptive Statistics, Reliabilities, and Bivariate Correlations of Five Different Estimates of People's Environmental Attitude

	<i>N</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
1 GEB (standard)	183	.04	.80	.76	1.00 ^a	1.00 ^a	1.00 ^a	1.00 ^a
2 GEB (PC)	183	.27	.41	.93	.80	1.00 ^a	1.00 ^a	1.00 ^a
3 GEB plus PEBT (PC)	183	.29	.38	.83	.92	.82	1.00 ^a	1.00 ^a
4 GEB plus PEBT (lenient)	183	.28	.77	.97	.92	.91	.77	1.00 ^a
5 GEB plus PEBT (strict)	183	.05	.76	.94	.89	.92	.97	.77

Note. *Ms* and *SDs* are expressed in logits. **Highlighted values** indicate comparatively diminished variances (noticeable in the squared standard deviations). In the correlation matrix (columns 1 to 5), the *diagonal cells* indicate separation reliability estimates (for details, see Wright & Masters, 1982). Off-diagonal values represent Pearson correlations that are either uncorrected for measurement error attenuation (below the diagonal; all coefficients are statistically significant at $p < .001$) or corrected (above the diagonal).

^aCorrections resulting in correlations exceeding 1.00 were truncated to 1.00.