Supplementary material for "Reduced empathic concern leads to utilitarian moral judgments in alexithymia"

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Supplementary Text S1

Detailed description of the two dilemmas used.

Standard Fumes (impersonal moral dilemma)

You work as the night caretaker in a small provincial hospital. During one of your rounds you realise that, because of a laboratory accident, some highly toxic fumes are spreading through the ventilation system towards a room in which there are five patients. In another room in the same ward there is just one patient.

You can activate a switch which allows the toxic fumes to be diverted away from the room with five patients. You know that the fumes will be directed to the single room where the patient will die, but the other five will be saved.

How appropriate is it for you to divert fumes to this room and sacrifice this one patient to save other five patients?

Footbridge (personal moral dilemma)

You are crossing a bridge which passes over the railway line and you see a fast-moving trolley on the track below. You notice that the trolley is out of control and that it will continue on its present course and collide with five people who are working ahead on the track, killing them. On the bridge next to you is a person you do not know and who happens to be very large.

You can throw this person off the bridge in such a way that this person's large body will block the oncoming trolley on collision. You know that this person will die, but the five workers will be unhurt.

How appropriate is it for you to push this stranger to death in order to save the five workers?

Supplementary Table S1

Spearman rank correlations between TAS, IRI subscale scores and ratings on moral dilemmas with 95% confidence intervals for correlation coefficients.

	TAS-20	F	PT	EC	PD	impersonal	personal
TAS-20	-	0.083 [-0.018, 0.175]	-0.115*** [-0.230, -0.008]	-0.125*** [-0.239, -0.015]	0.303*** [0.201, 0.407]	0.099 [-0.029, 0.224]	0.140** [0.037, 0.254]
F		-	0.081 [-0.024, 0.186]	0.269*** [0.164, 0.379]	0.263** [0.137, 0382]	-0.008 [-0.112, 0.092]	0.053 [-0.057, 0.161]
PT			-	0.265*** [0.163, 0.368]	-0.053 [-0.164, 0.061]	0.003 [-0.107, 0.119]	0.043 [-0.061, 0.147]
EC				-	0.286*** [0.172, 0.386]	-0.076 [-0.198, 0.42]	-0.119* [-0.222, -0.017]
PD					-	-0.011 [-0.121, 0.102]	0.033 [-0.083, 0.130]
impersonal						-	0.387*** [0.278, 0.491]
personal							-

Note: TAS = Toronto Alexithymia Scale; F = fantasy; PT = perspective taking; PD = personal distress; EC = empathic concern. *$p < 0.05$. **$p < 0.01$. ***$p < 0.001$. 95% bias corrected and accelerated confidence intervals for correlation coefficient were generated using 10,000 bootstrap samples.

Supplementary Table S2

Partial Spearman rank correlations controlling for age and gender (dummy coded 0: male, 1: female) between TAS, IRI subscale scores and ratings on moral dilemmas.

	TAS-20	**F**	**PT**	**EC**	**PD**	**impersonal**	**personal**
TAS-20	-	0.070	-0.126*	-0.135**	0.304***	0.102	0.138*
F		-	0.041	0.232***	0.186***	0.019	0.056
PT			-	0.259***	-0.082	0.008	0.035
EC				-	0.244***	-0.043	-0.103*
PD					-	0.023	0.046
impersonal						-	0.380***
personal							-

Note: TAS = Toronto Alexithymia Scale; F = fantasy; PT = perspective taking; PD = personal distress; EC = empathic concern.

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.

Supplementary Table S3

Alexithymia (TAS) scores predicting ratings on moral dilemmas and empathy IRI subscales with additional predictor variables of age and gender.

Predictor variable	Criterion variable	Logit coefficient [95% CI]*	Wald's chi-square	*p* -value
TAS-20	F	0.009 [-0.009, 0.027	1.104	0.293
	PT	-0.020 [-0.037, -0.007]	5.207	0.023
	EC	-0.023 [-0.042, -0.007]	6.958	0.008
	PD	0.050 [0.032, 0.067]	29.704	< 0.001
	impersonal	0.018 [-0.002, 0.039]	4.049	0.044
	personal	0.025 [0.005, 0.043]	7.004	0.008

Note: TAS = Toronto Alexithymia Scale; F = fantasy; PT = perspective taking; PD = personal distress; EC = empathic concern; CI = confidence interval.

* 95% bias corrected and accelerated confidence intervals for logit coefficients were generated using 10,000 bootstrap samples. Positive or negative value of logit coefficient denote that increase in value of predictor variable is associated with increased odds for *higher* or *lower* value of criterion variable, respectively.

Supplementary Table S4

IRI subscale scores predicting ratings on moral dilemmas in addition to age and gender.

Predictor variable	Criterion variable	Logit coefficient [95% CI]*	Wald's chi-square	*p* -value
F	impersonal	0.004 [-0.047, 0.053]	0.028	0.867
	personal	0.018 [-0.032, 0.073]	0.578	0.447
PT	impersonal	0.004 [-0.039, 0.054]	0.039	0.843
	personal	0.009 [-0.033, 0.052]	0.168	0.682
EC	impersonal	-0.012 [-0.063, 0.043]	0.233	0.629
	personal	-0.061 [-0.113, -0.001]	5.335	0.021
PD	impersonal	0.012 [-0.033, 0.060]	0.291	0.589
	personal	0.013 [-0.036, 0.059]	0.347	0.556

Note: F = fantasy; PT = perspective taking; PD = personal distress; EC = empathic concern; CI = confidence interval.

* 95% bias corrected and accelerated confidence intervals for logit coefficients were generated using 10,000 bootstrap samples. Positive or negative value of logit coefficient denote that increase in value of predictor variable is associated with increased odds for *higher* or *lower* value of criterion variable, respectively.

Supplementary Figure S1

Figure 1. Mediation analysis results. Negative logit coefficient from ordinal regression denotes reduced empathic concern and increased acceptability of utilitarian option on personal moral dilemma, while controlling for effects of age and gender. Bias-corrected and accelerated 95% CIs from 20,000 bootstrap samples are reported for specific indirect effects.