SUPPLEMENTARY MATERIAL

Body Swapping with a Black Person Boosts Empathy:

Using Virtual Reality to Embody Another

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This document contains the following:

(1)   The instructions for the motor movements (necessary for the body-swap group)
(2)   The Body Ownership Questionnaire (manipulation check for the EPT group)
(3)   The manipulation check for the MPT group
(4)   The manipulation check for the control group
(5)   The modified Symbolic Racism Scale
(6)   A first supplementary table of regression results and accompanying figures
(7)   A second supplementary table of internal reliability indices
(8)   The results of the mediation analysis between self-other merging and empathy
(9)   A third supplementary table comparing the IAT D-score across our and other studies and appropriate references, a violin plot of our own IAT scores, as well as a fourth supplementary table showcasing the distribution of ethnicities by experimental group.
(10)   A Principal Component Analysis (PCA) of all 59 empathy items.
(11)   Correlations between the PCA components and other measures.

Section S1: Motor movement (Body Swap) Instructions

[EPT Instructions only]: Try to keep the image you see centered in the middle of your field of view. If you see black on the borders, it probably means you have to adapt your head position. So it is very important to move slowly during this process to remain predictable. To make things easier, we will be assigning you roles: (participant's name) you will be the follower, and you will do your best to follow (confederate's name)'s movements accurately throughout the procedure.

To begin, put your hands on your thighs and your feet flat on the ground. Now, I'm going to ask you to slowly turn your head toward your right. Now, turn your head toward your left. Come back to a neutral position. Look up to the sky. Look down at the ground. Come back to neutral position.

Keep your hands on your thighs but look down at your hands. Raise your right index finger only and keep it up. Now raise your left index finger, and keep it up as well. Bring them back down. Now, come to a neutral neck position and slowly bring your palms together, with arms and fingers extended in front of you. Move them up and down. Small but quick, vigorous movements. [Always try to be as synchronized as possible]. Ok, gently stop moving your hands, but try interlocking your fingers, left thumb on top. Now, when I will say "squeeze" you will try squeezing your hands, and you will stop when I say "stop". "Squeeze… Stop", "Squeeze… Stop", "Squeeze… Stop". Now bring your hands back to your thighs and close your eyes until I tell you to open them again. Make sure your eyes are really closed. Are your eyes closed?

I'm now going to put an object in your right hand, so open it and make sure the object doesn't fall (put balls in right hands). Now keep your hands where they are but open your eyes and look down at the object in your right hand. Now, when I say "squeeze" you will try squeezing the ball, and you will stop when I say "stop". "Squeeze… Stop", "Squeeze… Stop", "Squeeze… Stop". Now, very slowly, like in slow motion, try putting the ball in your left hand. Now relax your neck to a neutral position and close your eyes until I tell you to open them again. Make sure your eyes are really closed. Are your eyes closed?

I'm now going to pick up the object (Take balls and uncover mirrors). [MPT: I'm now going to put a photograph in your right hand.] -- [check same hands/feet position] --You can now open your eyes.

- [EPT]: "For the next minute, look at yourself in the mirror in front of you."
- [MPT]: Bring the photograph in front of your camera so that it takes exactly half of your field of view. "For the next minute, take the perspective of the individual in the photograph. Imagine a day in the life of this individual as if you were that person, looking at the world through her eyes and walking through the world in her shoes." [After full minute: Now close your eyes while I pick up the photograph.]
- [CTR]: "For the next minute, take the time to let your mind wander. Imagine a day in your life, looking at the world through your eyes and walking through the world in your shoes."

Now, with your <u>palms facing down</u>, bring your hands in front of you, with arms and fingers extended. Now turn your palms up, back down, back up, and back down. Now, slowly bring your palms together again, arms and fingers extended in front of you. Move them up and down. Small but quick, vigorous movements. [Always try to be as synchronized as possible]. Ok, gently stop moving your hands and bring them to the armchairs.

Now we're going to try to stand up. When you are ready, try standing up, slowly. Now, slowly bring your palms together again, arms and fingers extended in front of you. Move them up and down. Small but quick, vigorous movements. [Always try to be as synchronized as possible]. Ok, gently stop moving your hands and bring them back to your side. Now, like we did earlier, slowly turn your head toward your right… your left. Come back to neutral position. Look up to the sky. Look down. Come back to neutral position. You can now sit again. Thank you, the session is now over. You can remove your headset.

Section S2: Body Ownership Questionnaire (manipulation check for Embodied PT)

INSTRUCTIONS: Please rate how much you agree with the following statements about your experience by circling the appropriate number. "0" means you do not agree at all, while "7" means you agree completely.

Scale:

I do not agree at all   I agree completely

0   1   2   3   4   5   6   7
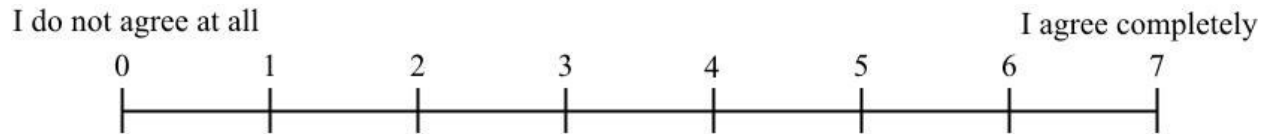
1.   It seemed like I was looking directly at my own body, rather than at someone else's body.
2.   It seemed like the body I saw began to resemble my real body.
3.   It seemed like the body I saw belonged to me.
4.   It seemed like the body I saw was my body.
5.   It seemed like the body parts I saw were part of my body.
6.   It seemed like my body was in the location where the body I saw was.
7.   It seemed like the body I saw was in the location where my body was.
8.   It seemed like the touch I felt was caused by the objects touching the body I saw.
9.   It seemed like I could have moved the body I saw if I had wanted.
10.   It seemed like I was in control of the body I saw.
11.   It seemed like my own body became unreal.
12.   It seemed like I was unable to move my body.
13.   It seemed like I could have moved my body if I had wanted.
14.   It seemed like I couldn't really tell where my body was.
15.   It seemed like my body had disappeared.
16.   It seemed like my body was out of my control.
17.   It seemed like my body was moving towards the body I saw.
18.   It seemed like the body I saw was moving towards my body.
19.   It seemed like I had two bodies.
20.   I found that experience enjoyable.
21.   I found that experience interesting.
22.   The touch of the objects in my hands was pleasant.
23.   I had the sensation of pins and needles in my body.
24.   I had the sensation that my body was numb.
25.   It seemed like the experience of my body was less vivid than normal.
26.   I found myself liking the body I saw.
27.   It seemed like I was feeling the objects I touched in the location where the body I saw touched the objects.

Section S3: Manipulation check for Mental PT

INSTRUCTIONS: Please rate how much you agree with the following statements about your experience by circling the appropriate number. "0" means you do not agree at all, while "7" means you agree completely.

Scale:

I do not agree at all   I agree completely

0   1   2   3   4   5   6   7
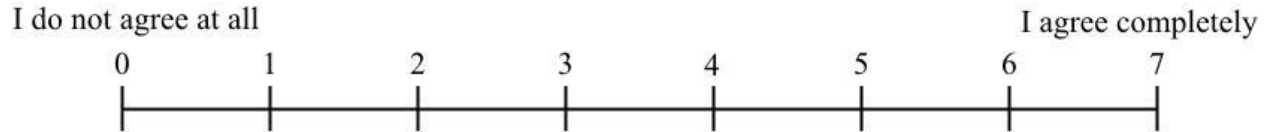
1.   I feel like I was imagining being in the other participant's skin.
2.   I feel like I took the perspective of the other participant.
3.   I imagined living a day in the life of the other participant.
4.   I feel like I was imagining being in my own skin.
5.   I feel like I took my own perspective.
6.   I imagined living a day in my life.

Section S4: Manipulation check for Control group

INSTRUCTIONS: Please rate how much you agree with the following statements about your experience by circling the appropriate number. "0" means you do not agree at all, while "7" means you agree completely.

Scale:

I do not agree at all   I agree completely

0   1   2   3   4   5   6   7
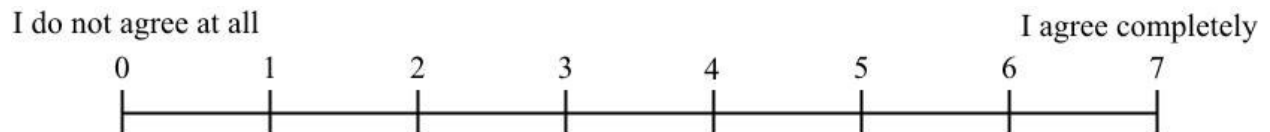
1.   I feel like I was imagining being in my own skin.
2.   I feel like I took my own perspective.
3.   I imagined living a day in my life.

Section S5: Adapted Symbolic Racism Scale

INSTRUCTIONS: The statements listed below describe attitudes you may have. There are no right or wrong answers. Please express your feelings by indicating how much you agree or disagree with each statement by circling the corresponding number.

Scale:

1	2	3	4
Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree

1. It's really a matter of some people not trying hard enough; if blacks would only try harder they could be just as well off as whites.
2. Irish, Italian, Jewish and many other minorities overcame prejudice and worked their way up. Blacks should do the same.
3. Some say that black leaders have been trying to push too fast. Others feel that they haven't pushed fast enough. How much do you agree with the first statement?
4. Blacks are responsible for creating much of the racial tension that exists in Canada today.
5. There is much discrimination against blacks in Canada today, limiting their chances to get ahead.
6. Generations of slavery and discrimination have created conditions that make it difficult for blacks to work their way out of the lower class.
7. Over the past few years, blacks have gotten less than they deserve.
8. Over the past few years, blacks have gotten more economically than they deserve.

Reference for original scale:

Henry, P. J., & Sears, D. O. (2002). The Symbolic Racism 2000 Scale. *Political Psychology, 23*(2), 253-283. https://doi.org/10.1111/0162-895X.00281

Sears, D. O., & Henry, P. J. (2005). Over thirty years later: A contemporary look at symbolic racism. *Advances in Experimental Social Psychology, 37*, 95-150. https://doi.org/10.1016/S0065-2601(05)37002-X

Section S6: Exploratory Regression Table and Figures

Table S1

Results of Simple Regression Analyses (Unregistered, Exploratory Analyses)

Predictor	Dependent Variable	t	p	R^2	β	95% CI
Embodiment Score	Implicit Race Bias	0.034	.973	.000	0.002	[-0.036, 0.040]
	Symbolic Racism	0.233	.818	.002	0.017	[-0.013, 0.116]
	Cognitive Empathy (QCAE)	0.576	.569	.012	0.048	[-0.010, 0.101]
	Affective Empathy (QCAE)	-0.127	.900	.001	-0.011	[-0.089, 0.062]
	Perspective taking (QCAE)	0.987	.332	.034	0.084	[-0.008, 0.149]
	Online simulation (QCAE)	0.107	.916	.000	0.011	[-0.050, 0.081]
	Emotion contagion (QCAE)	0.884	.384	.027	0.114	[-0.072, 0.116]
	Proximal responsivity (QCAE)	-0.988	.331	.034	-0.102	[-0.120, 0.051]
	Peripheral responsivity (QCAE)	-0.464	.646	.008	-0.044	[-0.129, 0.064]
	Perspective-Taking (IRI)	-0.315	.755	.004	-0.042	[-0.104, 0.063]
	Fantasy (IRI)	0.415	.681	.006	0.059	[0.011, 0.220]
	Empathic Concern (IRI)	-0.567	.575	.011	-0.064	[-0.097, 0.080]
	Personal Distress (IRI)	**2.299**	**.029**	**.159**	**0.330**	**[-0.057, 0.145]**
	Self-Other Merging	2.033	.052	.129	0.550	[-0.231, 0.198]

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Mental Perspective-Taking Score	Implicit Race Bias	-0.861	.397	.026	-0.027	[-0.038, 0.045]
	Symbolic Racism	0.918	.367	.029	0.045	[-0.015, 0.113]
	Cognitive Empathy (QCAE)	-0.281	.781	.003	-0.014	[-0.014, 0.102]
	Affective Empathy (QCAE)	-0.245	.808	.002	-0.012	[-0.092, 0.063]
	Perspective taking (QCAE)	-0.203	.841	.001	-0.015	[-0.000, 0.149]
	Online simulation (QCAE)	-0.246	.808	.002	-0.013	[-0.049, 0.081]
	Emotion contagion (QCAE)	0.179	.859	.001	0.011	[-0.077, 0.114]
	Proximal responsivity (QCAE)	0.364	.718	.005	0.022	[-0.115, 0.058]
	Peripheral responsivity (QCAE)	-1.094	.283	.041	-0.067	[-0.113, 0.058]
	Perspective-Taking (IRI)	-1.140	.264	.046	-0.077	[-0.102, 0.068]
	Fantasy (IRI)	0.799	.431	.023	0.067	[0.004, 0.230]
	Empathic Concern (IRI)	-0.308	.761	.003	-0.021	[-0.089, 0.095]
	Personal Distress (IRI)	-0.652	.520	.015	-0.058	[-0.059, 0.158]
	Self-Other Merging	0.697	.492	.017	0.116	[-0.211, 0.215]
Inclusion of Other in the Self	Implicit Race Bias	0.345	.731	.001	0.007	[-0.038, 0.047]
	Symbolic Racism	-1.168	.246	.015	-0.034	[-0.095, 0.019]
	Cognitive Empathy (QCAE)	-0.248	.805	.001	-0.007	[-0.062, 0.054]
	Affective Empathy (QCAE)	0.935	.352	.010	0.030	[-0.027, 0.091]

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				β	CI
Perspective taking (QCAE)	-0.957	.341	.010	-0.034	[-0.097, 0.039]
Online simulation (QCAE)	0.582	.562	.004	0.020	[-0.058, 0.099]
Emotion contagion (QCAE)	1.017	.312	.012	0.045	[-0.042, 0.138]
Proximal responsivity (QCAE)	0.133	.895	.000	0.005	[-0.081, 0.082]
Peripheral responsivity (QCAE)	1.066	.289	.013	0.040	[-0.026, 0.108]
Perspective-Taking (IRI)	0.065	.948	.000	0.003	[-0.095, 0.094]
Fantasy (IRI)	0.043	.966	.000	0.002	[-0.081, 0.085]
Empathic Concern (IRI)	1.928	.057	.041	0.080	[0.001, 0.171]
Personal Distress (IRI)	**2.619**	**.010**	**.073**	**0.128**	**[0.033, 0.218]**

Note. β = standardized regression coefficient (beta); CI = bootstrapped confidence interval; QCAE: Questionnaire of Cognitive and Affective Empathy; IRI: Interpersonal Reactivity Index. Degrees of freedom are 28 for Embodiment and Mental Perspective-Taking scores, and 88 for the other measures (note: one participant did not complete the IRI, so degree of freedom is one fewer for this variable).

Figure S1

Scatter Plot and Regression Line of Embodiment and Personal Distress
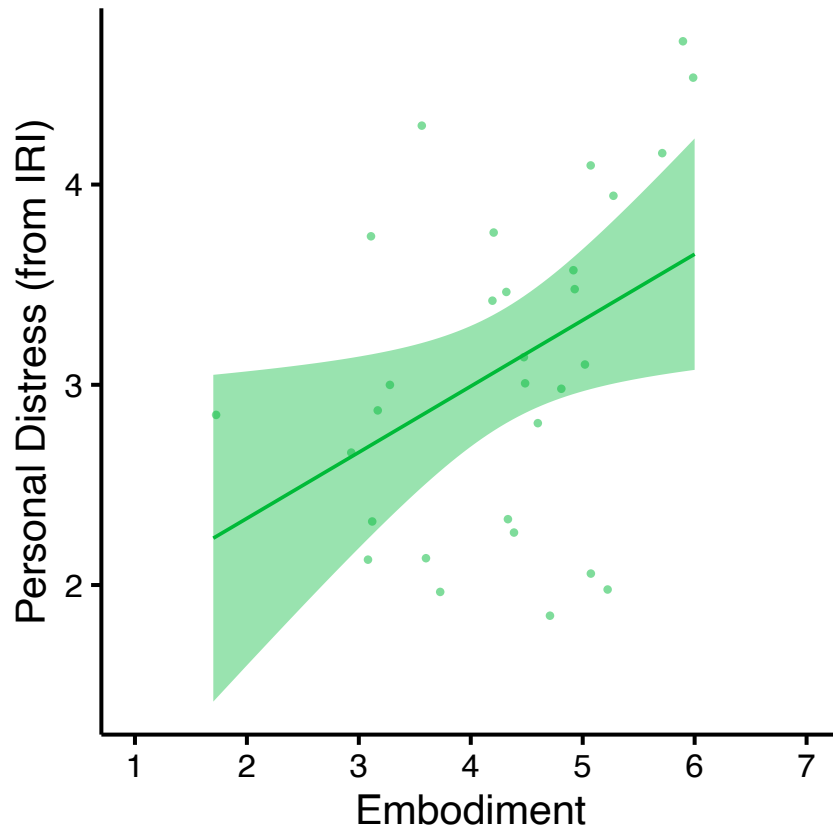
Note. Effect of participants' embodiment of the confederate's body on the *Personal Distress* subscale of the Interpersonal Reactivity Index (IRI). Data from the Embodied Perspective-Taking group only. Embodiment predicted personal distress. Shaded area represents 95% confidence band. Points have been randomly jittered to reduce overplotting.

Figure S2

Scatter Plot and Regression Line of Self-Other Merging and Personal Distress
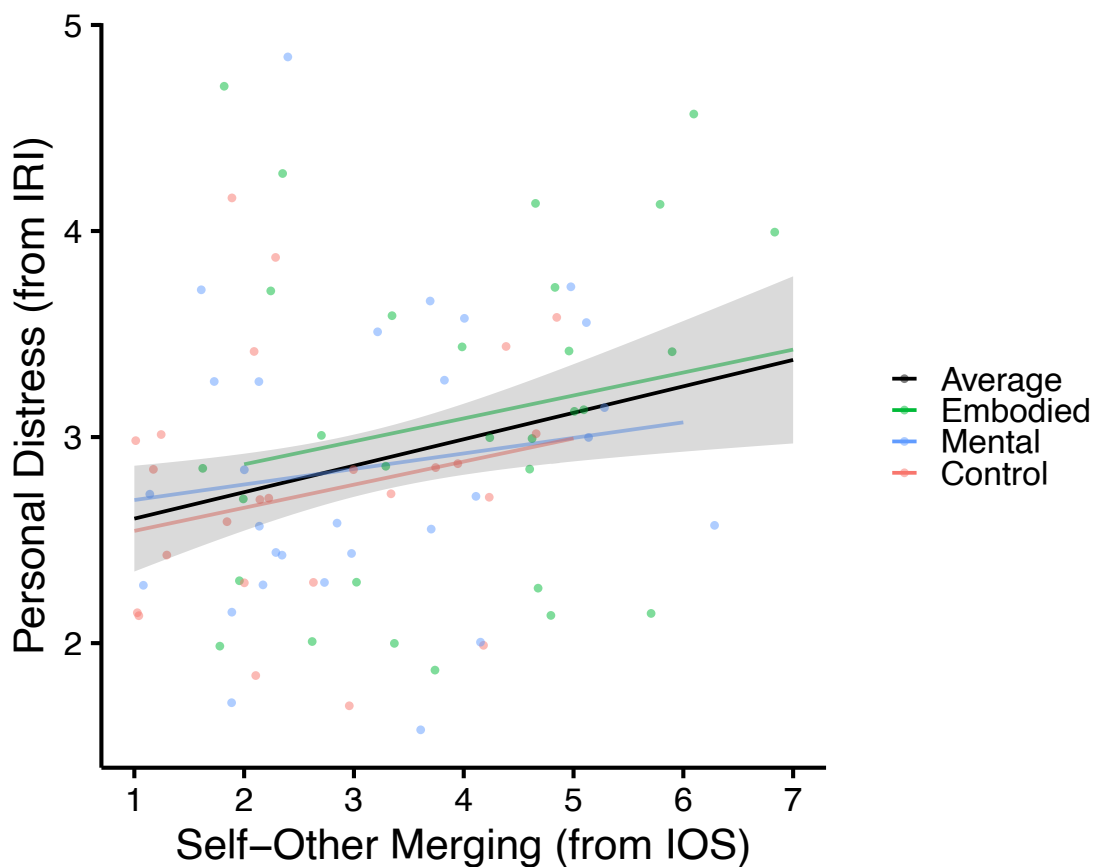
Note. Effect of participants' self-other merging (IOS, Inclusion of the Other in the Self scale) on the *Personal Distress* subscale of the Interpersonal Reactivity Index (IRI). Self-other merging predicted personal distress (overall). Shaded area represents 95% confidence band (for the average). Points have been randomly jittered to reduce overplotting.

Section S7: Internal Reliability Table

Table S2

Internal Reliability for Each Multi-Item Questionnaire Used in the Current Study

Questionnaire	Raw Cronbach Alpha	Guttman's Lambda 6
Symbolic Racism Scale	.746	.754
QCAE (Cognitive Empathy)	.868	.913
QCAE (Affective Empathy)	.796	.846
QCAE (Perspective-Taking)	.860	.874
QCAE (Online Simulation)	.829	.835
QCAE (Emotion Contagion)	.753	.707
QCAE (Proximal Responsivity)	.651	.627
QCAE (Peripheral Responsivity)	.556	.591
IRI (Perspective-Taking)	.760	.772
IRI (Fantasy Seeking)	.740	.755
IRI (Empathic Concern)	.771	.776
IRI (Personal Distress)	.749	.764
Manipulation Check – EPT	.872	.990
Manipulation Check - MPT	.725	.817
Manipulation Check - Control	.660	.573

Note. Underlined values indicate questionable (< .7) or poor (< .6) internal consistency.

Section S8: Results of Mediation Analyses

Table S3

Mediation: Group → Self-Other Merging → Empathic Concern/Personal Distress (IRI)

Questionnaire	Effect	p	β	95% CI
Empathic Concern (IRI)	ACME (indirect effect)	.323	0.067	[-0.070, 0.212]
	ADE (direct effect)	.130	0.240	[-0.064, 0.556]
	Total effect	**.036**	**0.307**	**[0.019, 0.590]**
	Proportion mediated	.347	0.200	[-0.510, 1.462]
Personal Distress (IRI)	ACME (indirect effect)	.091	0.146	[-0.028, 0.351]
	ADE (direct effect)	.296	0.200	[-0.178, 0.575]
	Total effect	**.042**	**0.346**	**[0.011, 0.670]**
	Proportion mediated	.131	0.399	[-0.333, 2.757]

Note. β = standardized regression coefficient (beta); CI = bootstrapped confidence interval. This mediation analysis uses EPT as treatment value and the control group as control value.

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Section S9: IAT Score Comparisons Across Different Studies

Table S4

Comparison of Greenwald et al. (2003)'s D-Scores Across Multiple Studies Comparing Ways to

Reduce Implicit Race Bias Measured Via the Implicit Association Test

Study	Experiment Number	Group	*D*-score (Implicit Association Test)
Current study	1 (n = 90)	Embodied perspective-taking	**0.07**
		Mental perspective-taking	**0.01**
		Control	**0.02**
Todd et al. (2011)	1 (n = 51)	Perspective-taking–other	0.32
		Perspective-taking–self	0.43
		Control	0.80
	2 (n = 38)	Perspective-taking	0.01
		Control	0.49
	3 (n = 56)	Perspective-taking	0.35
		Control	0.55†
Devine et al. (2012)	1 (n = 91)	Before intervention baseline, both control and experimental groups	0.46
		After 12-week intervention, experimental group	0.30
Lai et al. (2014)	Across four sub-studies (n = 17,021)	Control groups	0.42 – 0.50
		Eight interventions that worked	0.15 – 0.51
		Training Empathic Responding	0.44
		Perspective Taking	0.47
		Imagining Interracial Contact	0.44
Lai et al. (2016)	Across both sub-studies (n = 6,321)	Control groups	0.44 – 0.60

Note. † Value estimated from their Figure 1.

References (Table S4)

Devine, P. G., Forscher, P. S., Austin, A. J., & Cox, W. T. L. (2012). Long-term reduction in implicit race bias: A prejudice habit-breaking intervention. *Journal of Experimental Social Psychology*, *48*(6), 1267-1278. https://doi.org/10.1016/j.jesp.2012.06.003

Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology*, *85*(2), 197. https://doi.org/10.1037/0022-3514.85.2.197

Lai, C. K., Marini, M., Lehr, S. A., Cerruti, C., Shin, J. E., Joy-Gaba, J. A., . . . Nosek, B. A. (2014). Reducing implicit racial preferences: I. A comparative investigation of 17 interventions. *Journal of experimental psychology. General*, *143*(4), 1765-1785. https://doi.org/10.1037/a0036260

Lai, C. K., Skinner, A. L., Cooley, E., Murrar, S., Brauer, M., Devos, T., . . . Nosek, B. A. (2016). Reducing implicit racial preferences: II. Intervention effectiveness across time. *Journal of experimental psychology. General*, *145*(8), 1001-1016. https://doi.org/10.1037/xge0000179

Todd, A. R., Bodenhausen, G. V., Richeson, J. A., & Galinsky, A. D. (2011). Perspective taking combats automatic expressions of racial bias. *Journal of Personality and Social Psychology*, *100*(6), 1027-1042. https://doi.org/10.1037/a0022308
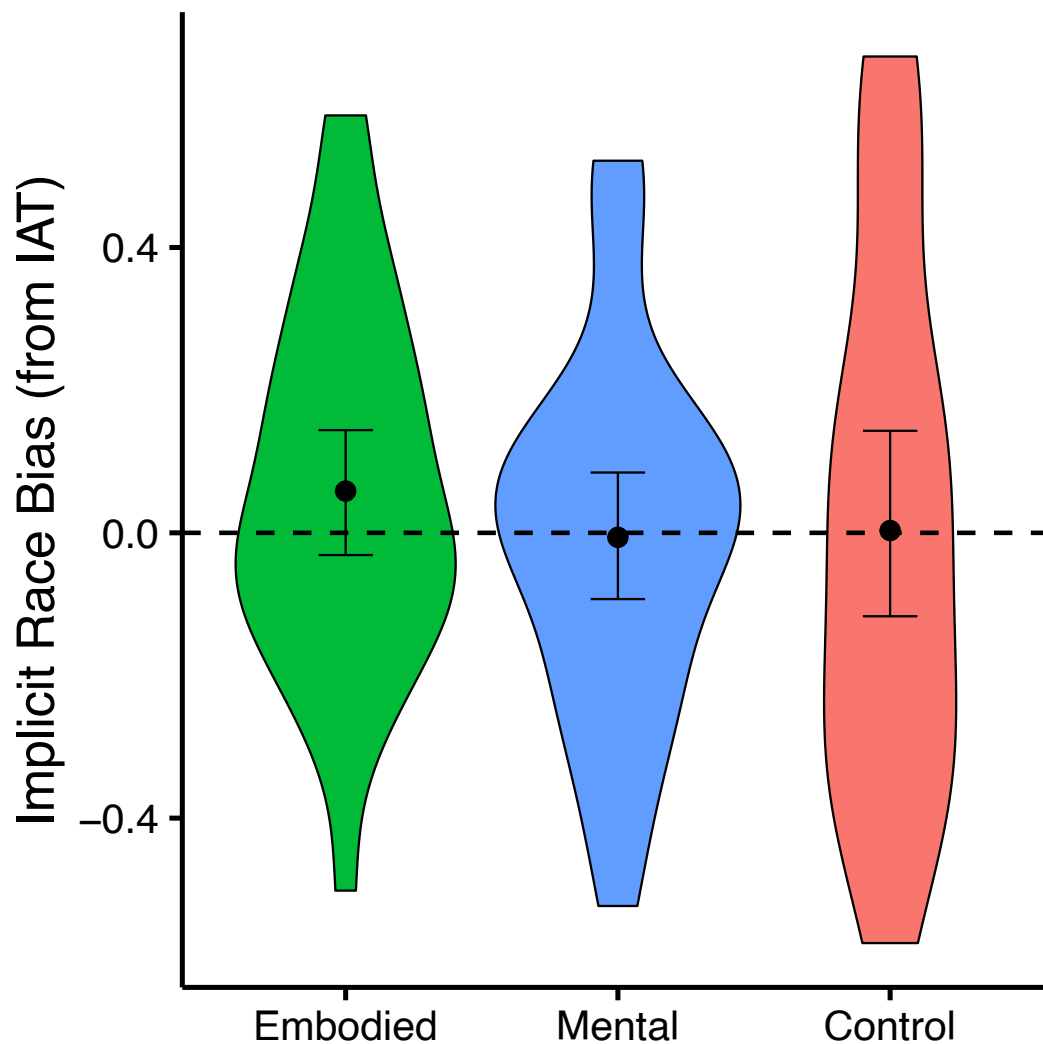
Table S5

Comparison of Ethnic Group Frequency by Experimental Group Assignment

	Embodied Perspective-Taking	Mental Perspective-Taking	Control Group
White	15	17	13
Asian	8	9	6
South-Asian	5	1	9
Arab	0	3	0
South American	1	0	1
South-East-Asian	1	0	1

Figure S3

Violin Plot of Implicit Race Bias Scores by Group

Note. Effects of experimental condition on implicit race bias (Implicit Association Test). Dots = means; error bars = bootstrapped 95% confidence intervals; width = distribution density (frequency).

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Section S10: Principal Component Analysis of All 59 Empathy Items

We conducted a Principal Component Analysis (PCA) with oblique ("oblimin") rotation and 6 components based on a scree plot and parallel analysis (below). The six components are: (1) Perspective-Taking, (2) Empathic Accuracy, (3) Fiction Empathy, (4) Affective Resonance, (5) Composure, and (6) Empathic Concern. We report the component loadings (Table S6), the new contrast analyses (Table S7), and figures (Figure S4) based on these components on the following pages.

All items correlate with at least a few others, as recommended. Bartlett's test of sphericity, x^2 (1711) = 3501.8, $p < .001$, confirmed the inter-item correlations were large enough for the analysis. The overall Kaiser–Meyer–Olkin measure of sampling adequacy was questionable at 0.5; 25 items out of 49 showed values smaller than .5, though we did not exclude these items for this analysis. The correlation matrix determinant was 4.4e-23, suggesting multicollinearity—most likely due to the empathy questionnaires sharing some items. Residuals distributed normally, the average communalities of the 49 items was suboptimal at .4, the item:factor ratio was sufficiently high at 5.8, and the fit based upon off diagonal values was acceptable at 0.91. Less than 50% of residuals (44.4%) were larger than .05, as recommended, and the root-mean-square residual (.07) was appropriately under the commonly accepted limit of .08. The full tables of loadings, correlations, and structure matrix are available upon request.
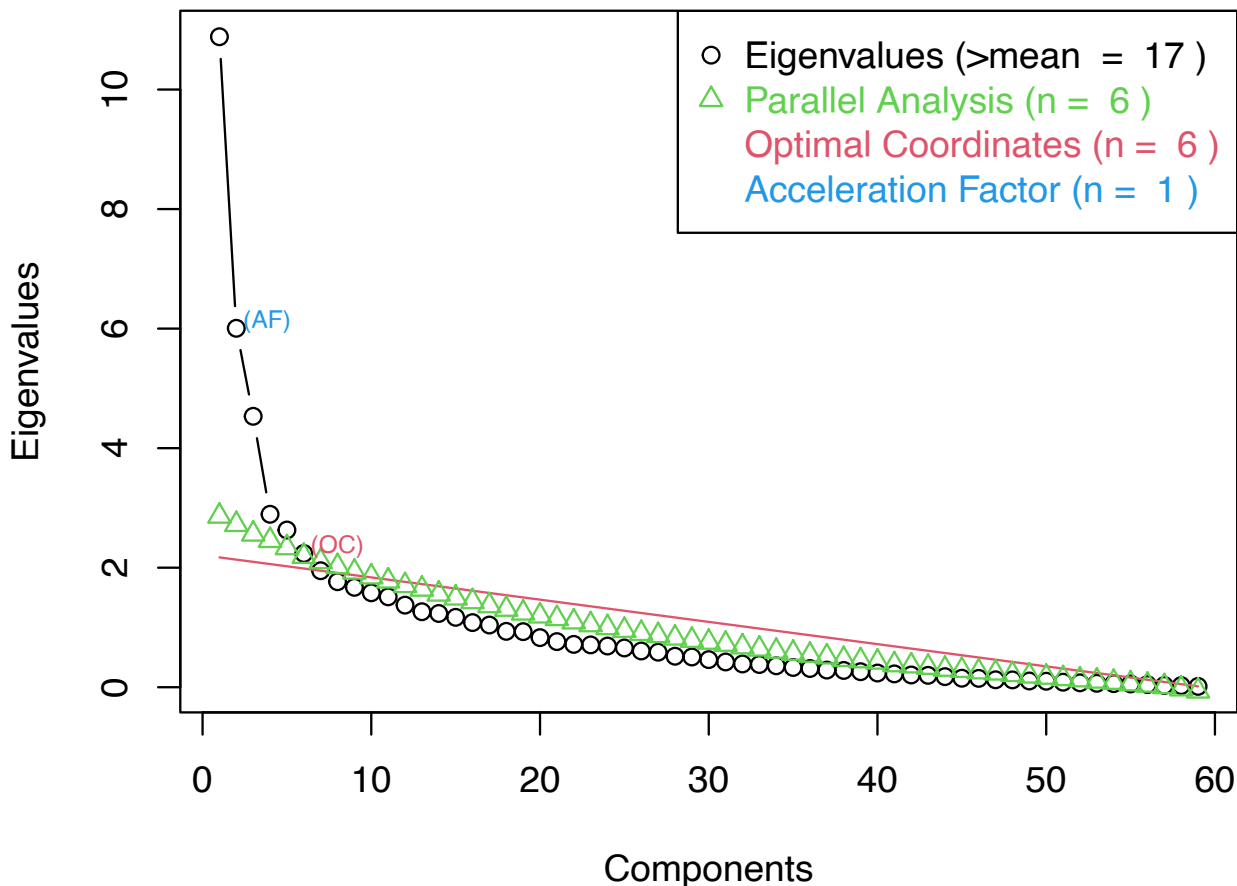
Non Graphical Solutions to Scree Test

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Table S6

Principal Empathy Components

Component	Item no	Item	Original Scale (Loading)
Perspective-Taking	1-2	Before criticizing somebody, I try to imagine how I would feel if I was in their place.	IRI (0.77), QCAE (0.62)
	3-4	When I am upset at someone, I usually try to 'put myself in his shoes' for a while.	IRI (0.71), QCAE (0.63)
	5-6	I sometimes find it difficult to see things from the 'other guy's' point of view.	IRI (0.60), QCAE (0.72)
	7-8	I try to look at everybody's side of a disagreement before I make a decision.	IRI (0.55), QCAE (0.70)
	9	I believe that there are two sides to every question and try to look at them both.	IRI (0.66)
	10	I always try to consider the other fellow's feelings before I do something.	QCAE (0.61)
	11	I can usually appreciate the other person's viewpoint, even if I do not agree with it.	QCAE (0.57)
	12-13	I sometimes try to understand my friends better by imagining how things look from their perspective.	IRI (0.62), QCAE (0.46)
Empathic Accuracy	14	I can easily tell if someone else wants to enter a conversation.	QCAE (0.74)
	15	I am good at predicting how someone will feel.	QCAE (0.70)
	16	I am quick to spot when someone in a group is feeling awkward or uncomfortable.	QCAE (0.70)
	17	I can tell if someone is masking their true emotion.	QCAE (0.70)
	18	I can pick up quickly if someone says one thing but means another.	QCAE (0.69)
	19	I can easily work out what another person might want to talk about.	QCAE (0.62)
	20	I am good at predicting what someone will do.	QCAE (0.61)
	21	I can easily tell if someone else is interested or bored with what I am saying.	QCAE (0.58)
	22	Other people tell me I am good at understanding how they are feeling and what they are thinking.	QCAE (0.57)

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Fiction Empathy	23-24	I am usually objective when I watch a film or play, and I don't often get completely caught up in it.	IRI (0.76), QCAE (0.82)
	25	I usually stay emotionally detached when watching a film.	QCAE (0.76)
	26-27	I often get deeply involved with the feelings of a character in a film, play or novel.	IRI (0.69), QCAE (0.56)
	28	When I watch a good movie, I can very easily put myself in the place of a leading character.	IRI (0.51)
Affective Resonance	29	It worries me when others are worrying and panicky.	QCAE (0.79)
	30	I am inclined to get nervous when others around me seem to be nervous.	QCAE (0.72)
	31	People I am with have a strong influence on my mood.	QCAE (0.60)
	32	It affects me very much when one of my friends seems upset.	QCAE (0.54)
Composure	33	I am usually pretty effective in dealing with emergencies.	IRI (0.70)
	34	I tend to lose control during emergencies.	IRI (0.70)
Empathic Concern	35	Sometimes I don't feel very sorry for other people when they are having problems.	IRI (0.61)
Items with loadings < 0.5	36	I daydream and fantasize	IRI
	37	I often have tender, concerned feelings for people less fortunate than me.	IRI
	38	In emergency situations, I feel apprehensive and ill-at-ease.	IRI
	39	When I see someone being taken advantage of, I feel kind of protective towards them.	IRI
	40	I sometimes feel helpless when I am in the middle of a very emotional situation.	IRI
	41	Becoming extremely involved in a good book or movie is somewhat rare for me.	IRI
	42	When I see someone get hurt, I tend to remain calm.	IRI
	43	Other people's misfortunes do not usually disturb me a great deal.	IRI
	44	If I'm sure I'm right about something, I don't waste much time listening to other people's arguments.	IRI
	45	After seeing a play or movie, I have felt as though I were one of the characters.	IRI
	46	Being in a tense emotional situation scares me.	IRI

47	When I see someone being treated unfairly, I sometimes don't feel very much pity for them.	IRI
48	I am often quite touched by things that I see happen.	IRI
49	I would describe myself as a pretty soft-hearted person.	IRI
50	When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me.	IRI
51	When I see someone who badly needs help in an emergency, I go to pieces.	IRI
52	I often get emotionally involved with my friends' problems.	QCAE
53	I get very upset when I see someone cry.	QCAE
54	I am happy when I am with a cheerful group and sad when the others are glum.	QCAE
55	It is hard for me to see why some things upset people so much.	QCAE
56	I find it easy to put myself in somebody else's shoes.	QCAE
57	Friends talk to me about their problems as they say that I am very understanding.	QCAE
58	I can sense if I am intruding, even if the other person does not tell me.	QCAE
59	Before I do something I try to consider how my friends will react to it.	QCAE

Note. Some items appeared in both the Questionnaire of Cognitive and Affective Empathy (QCAE) and the Interpersonal Reactivity Index (IRI) with identical or highly similar wording, so they are only displayed once. Components only include items with loadings greater than 0.5; other items appear at the end. Some items were reversed-scored beforehand, as appropriate.

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Table S7

Results of Multiple Regression with Planned Contrast Analyses (Based on Principal Component Analysis of Empathy Items)

Principal Component	Comparison	t	p	d_R	95% CI
Perspective-Taking	Embodied - Control	-0.09	.932	-0.13	[-0.761, 0.405]
	Mental - Control	0.11	.910	-0.09	[-0.618, 0.429]
	Embodied - Mental	-0.20	.843	-0.04	[-0.54, 0.525]
Empathic Accuracy	Embodied - Control	-1.33	.188	-0.46	[-1.041, 0.073]
	Mental - Control	-0.77	.441	-0.22	[-0.78, 0.296]
	Embodied - Mental	-0.54	.590	-0.24	[-0.791, 0.306]
Fiction Empathy	Embodied - Control	1.19	.236	0.37	[-0.193, 1.045]
	Mental - Control	-0.51	.611	-0.05	[-0.577, 0.577]
	Embodied - Mental	1.69	.094	0.42	[-0.071, 0.94]
Affective Resonance	Embodied - Control	0.38	.702	0.14	[-0.469, 0.783]
	Mental - Control	**2.08**	**.040**	**0.50**	**[-0.042, 1.105]**
	Embodied - Mental	-1.70	.093	-0.36	[-0.894, 0.104]
Composure	**Embodied - Control**	**2.00**	**.049**	**0.52**	**[-0.062, 1.123]**
	Mental - Control	0.43	.665	0.10	[-0.402, 0.559]
	Embodied - Mental	1.55	.125	0.42	[-0.142, 1.028]
Empathic Concern	**Embodied - Control**	**2.95**	**.004**	**0.70**	**[0.196, 1.278]**
	Mental - Control	1.70	.093	0.51	[-0.006, 1.118]
	Embodied - Mental	1.23	.223	0.19	[-0.276, 0.71]

Note. d_R = robust Cohen's *d*; CI = bootstrapped confidence interval. The comparisons were between-groups only (i.e., there were no within-subject pre/post comparisons). Components were identified through principal component analysis of 59 items (from the Questionnaire of Cognitive and Affective Empathy and Interpersonal Reactivity Index). One participant did not complete the Interpersonal Reactivity Index so was excluded from the principal component analysis (and therefore from these regression analyses). Degrees of freedom are 86.

Figure S4: *Comparison of Experimental Groups on Principal Components of Empathy*
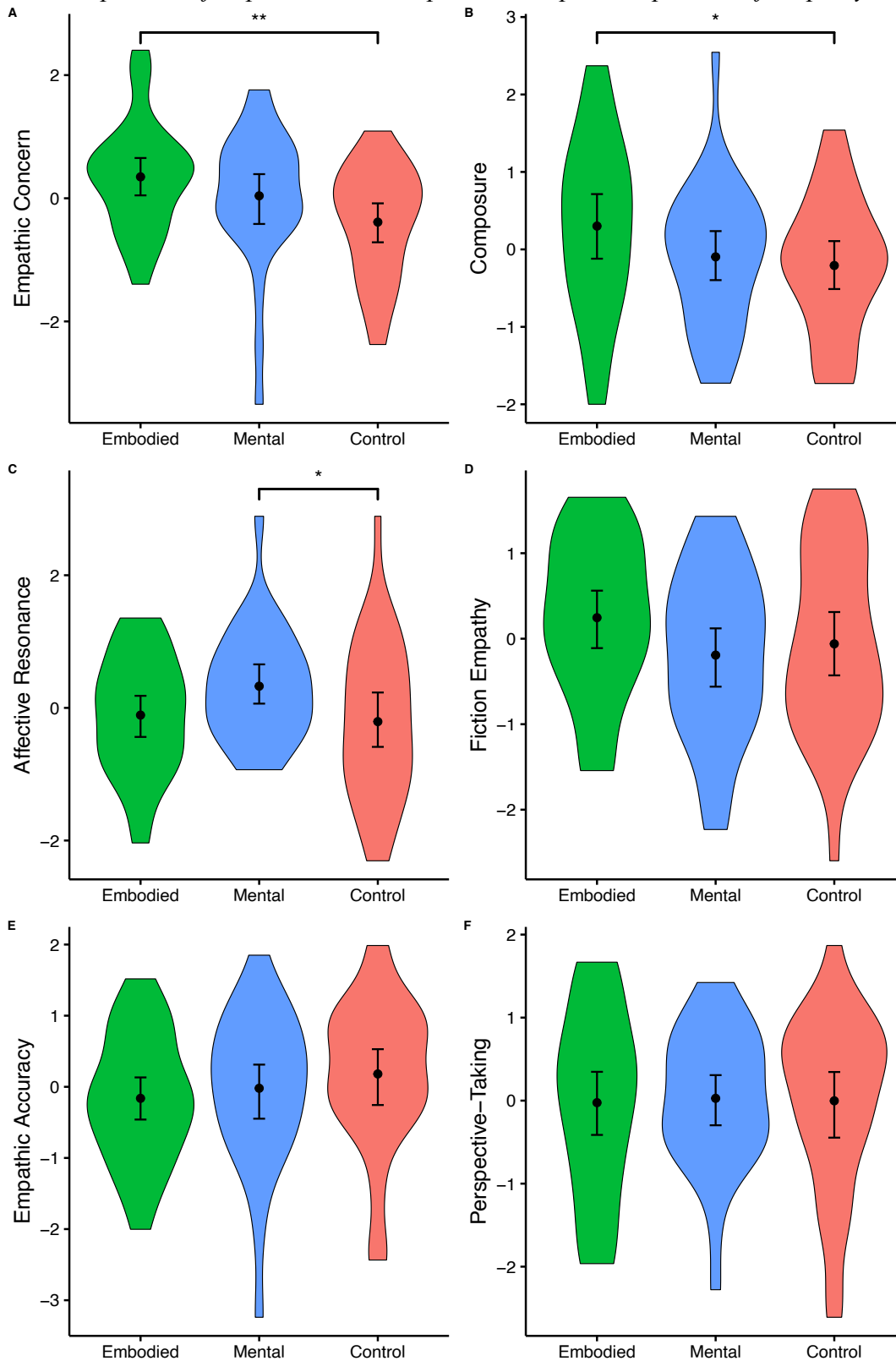
Note. Effects of experimental condition on empathy components as identified through principal component analysis. Dots = means; error bars = bootstrapped 95% confidence intervals; width = distribution density (frequency). * = $p < .05$; ** = $p < .01$. Empathy was generally highest in the Embodied Perspective-Taking group.

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Section S11: Correlations Between the PCA Components and Other Measures

Table S8

Correlations Between Principal Components (of Empathy) and Embodiment (Embodied Group Only)

Principal Component	*r*	*p*
Perspective-Taking	-.04	.816
Empathic Accuracy	.14	.476
Fiction Empathy	.03	.892
Affective Resonance	.04	.821
Composure	**.40**	**.030**
Empathic Concern	-.23	.229

Note. Components were identified through principal component analysis of 59 items (from the Questionnaire of Cognitive and Affective Empathy and Interpersonal Reactivity Index). One participant did not complete the Interpersonal Reactivity Index so was excluded from the principal component analysis (and therefore from these correlation analyses). Degrees of freedom are 28.

Table S9

Correlations Between Principal Components (of Empathy) and Self-Other Merging by and Across Groups

Group	Principal Component	r	p
All Groups	Perspective-Taking	-.02	.831
	Empathic Accuracy	-.05	.664
	Fiction Empathy	.03	.753
	Affective Resonance	.20	.055
	Composure	**.25**	**.018**
	Empathic Concern	.20	.065
Embodied	Perspective-Taking	-.15	.419
	Empathic Accuracy	.01	.955
	Fiction Empathy	.09	.642
	Affective Resonance	.00	.993
	Composure	.30	.104
	Empathic Concern	-.03	.861
Mental	Perspective-Taking	.11	.576
	Empathic Accuracy	.07	.716
	Fiction Empathy	-.08	.694
	Affective Resonance	.31	.105
	Composure	.12	.524
	Empathic Concern	.10	.617
Control	Perspective-Taking	.04	.831
	Empathic Accuracy	-.02	.901
	Fiction Empathy	-.10	.582
	Affective Resonance	.35	.055
	Composure	.05	.801
	Empathic Concern	.16	.400

Note. Components were identified through principal component analysis of 59 items (from the Questionnaire of Cognitive and Affective Empathy and Interpersonal Reactivity Index). One participant did not complete the Interpersonal Reactivity Index so was excluded from the principal component analysis (and therefore from these correlation analyses). Degrees of freedom are 28 for the individual groups and 87 when collapsing groups.