

Opposing contributions of psychologically distinct components of empathy to empathic accuracy

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Supplementary Materials

Empathy Self-Report Items

Our studies made use of the same 6 subscales as Jordan, Amir, and Bloom (2016), all of which are listed below:

Interpersonal Reactivity Index (Davis, 1980)

Perspective Taking

1. I sometimes find it difficult to see things from the “other guy’s” point of view.
2. I try to look at everybody’s side of a disagreement before I make a decision.
3. I sometimes try to understand my friends better by imagining how things look from their perspective.
4. If I’m sure I’m right about something, I don’t waste much time listening to other people’s arguments.
5. I believe that there are two sides to every question and try to look at them both.
6. When I’m upset at someone, I usually try to “put myself in his shoes” for a while.
7. Before criticizing somebody, I try to imagine how I would feel if I were in their place.

Fantasy

1. I really get involved with the feelings of the characters in a novel.
2. I am usually objective when I watch a movie or play, and I don’t often get completely caught up in it.
3. Becoming extremely involved in a good book or movie is somewhat rare for me.
4. After seeing a play or movie, I have felt as though I were one of the characters.
5. When I watch a good movie, I can very easily put myself in the place of a leading character.
6. 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.
7. I daydream and fantasize, with some regularity, about things that might happen to me.

Concern (Empathic Concern)

1. I often have tender, concerned feelings for people less fortunate than me.
2. Sometimes I don’t feel very sorry for other people when they are having problems.

3. When I see someone being taken advantage of, I feel kind of protective towards them.
4. Other people's misfortunes do not usually disturb me a great deal.
5. When I see someone being treated unfairly, I sometimes don't feel very much pity for them.
6. I am often quite touched by things that I see happen.
7. I would describe myself as a pretty soft-hearted person.

Personal Distress

1. In emergency situations, I feel apprehensive and ill-at-ease.
2. I sometimes feel helpless when I am in the middle of a very emotional situation.
3. When I see someone get hurt, I tend to remain calm.
4. Being in a tense emotional situation scares me.
5. I am usually pretty effective in dealing with emergencies.
6. I tend to lose control during emergencies.
7. When I see someone who badly needs help in an emergency, I go to pieces.

Empathy Index (Jordan, Amir, & Bloom, 2016)

Empathy

1. If I see someone who is excited, I will feel excited myself.
2. I sometimes find myself feeling the emotions of the people around me, even if I don't try to feel what they're feeling.
3. If I'm watching a movie and a character injures their leg, I will feel pain in my leg.
4. If I hear a story in which someone is scared, I will imagine how scared I would be in that situation and begin to feel scared myself.
5. If I hear an awkward story about someone else, I might feel a little embarrassed.
6. I can't watch shows in which an animal is being hunted one another because I feel nervous as if I am being hunted.
7. If I see someone fidgeting, I'll start feeling anxious too.

Behavioral Contagion

1. If I see someone else yawn, I am also likely to yawn.
2. If I see someone vomit, I will gag.
3. I catch myself crossing my arms or legs just like the person I'm talking to.
4. If I see a video of a baby smiling, I find myself smiling.
5. If I see someone suddenly looking away, I'll automatically look in the direction they are looking.
6. If I'm watching someone walking on a balance beam, I will lean when they lean.
7. If I'm having a conversation with someone and they scratch their nose, I will also scratch my nose.

Descriptive Statistics for the Empathy Measures

Table S1 below lists the means, standard deviations, and Cronbach's alphas for each of the subscales included in our empathy measures and their associated factors across all three studies.

Table S1. Descriptive statistics for all studies.

	Study 1a (N=399)			Study 1b (N=402)			Study 2 (N=399)			Study 3 (N=498)			Study 4 (N=396)		
	<i>M</i>	<i>SD</i>	<i>α</i>	<i>M</i>	<i>SD</i>	<i>α</i>	<i>M</i>	<i>SD</i>	<i>α</i>	<i>M</i>	<i>SD</i>	<i>α</i>	<i>M</i>	<i>SD</i>	<i>α</i>
F1 Contagion	1.96	.65		2.00	.68		1.97	.69		1.87	.73		2.06	.74	
1. Empathy	2.01	.80	.81	1.95	.88	.84	2.03	.85	.83	1.89	.87	.83	2.11	.89	.85
2. Behavioral Contagion	2.22	.77	.76	2.24	.82	.80	2.17	.81	.77	2.13	.83	.80	2.29	.82	.79
3. Personal Distress	1.63	.86	.86	1.80	.79	.79	1.70	.91	.86	1.59	.95	.89	1.76	.94	.87
F2 Concern	2.73	.70		2.66	.58		2.73	.71		2.77	.74		2.70	.68	
1. Concern	2.76	.84	.87	2.73	.71	.77	2.76	.86	.87	2.79	.89	.89	2.68	.80	.83
2. Perspective Taking	2.69	.74	.83	2.58	.67	.75	2.69	.74	.83	2.75	.79	.85	2.72	.75	.82
Fantasy	2.46	.77	.79	2.37	.71	.70	2.50	.82	.81	2.43	.85	.82	2.46	.81	.80

Details of Factor Analyses

As we describe in the main text, after creating the six subscales, they were submitted to factor analysis with oblique promax rotation. The results of these analyses were highly consistent across all three studies and replicated the factor structure observed in Jordan, Amir & Bloom (2016). Tables S2-4 below list the factor loadings in each study, as well as descriptive statistics for each factor analysis.

Study 1a

Bartlett's Test of Sphericity, $\chi^2(15) = 664.159, p < .001$

KMO = .650

Table S2. Principal Components Factor Analysis with Promax Rotation in Study 1.

Component	Component Loading		Communality
	Factor 1: Contagion	Factor 2: Concern	
Empathy	.879		.786
Behavioral Contagion	.853		.737
Personal Distress	.645		.636
Concern		.831	.691
Perspective Taking		.836	.699
Fantasy	.513	.517	.475
% of Total Variance	39.3%	27.8%	

Note: Blanks indicate loadings < |.4|

Study 1b

Bartlett's Test of Sphericity, $\chi^2(15) = 649.567, p < .001$

KMO = .646

Table S3. Principal Components Factor Analysis with Promax Rotation in Study 1b.

Component	Component Loading		Communality
	Factor 1: Contagion	Factor 2: Concern	
Empathy	.900		.818
Behavioral Contagion	.823		.687
Personal Distress	.671		.643
Concern		.810	.657
Perspective Taking		.801	.642
Fantasy	.527	.574	.543
% of Total Variance	38.83%	27.67%	

Note: Blanks indicate loadings < |.4|

Study 2

Bartlett's Test of Sphericity, $\chi^2(15) = 624.760, p < .001$

KMO = .616

Table S4. Principal Components Factor Analysis with Promax Rotation in Study 2.

Component	Component Loading		Communality
	Factor 1: Contagion	Factor 2: Concern	
Empathy	.873		.789
Behavioral Contagion	.854		.736
Personal Distress	.660		.601
Concern		.820	.673
Perspective Taking		.829	.695
Fantasy	.407	.574	.458
% of Total Variance	36.8%	29.1%	

Note: Blanks indicate loadings < |.4|

Study 3

Bartlett's Test of Sphericity, $\chi^2(15) = 922.372, p < .001$

KMO = .695

Table S5. Principal Components Factor Analysis with Promax Rotation in Study 3.

Component	Component Loading		Communality
	Factor 1: Contagion	Factor 2: Concern	
Empathy	.875		.800
Behavioral Contagion	.854		.737
Personal Distress	.735		.634
Concern		.836	.700
Perspective Taking		.812	.696
Fantasy	.385	.746	.615
% of Total Variance	41.57%	28.13%	

Note: Blanks indicate loadings < |.4|

Study 4

Bartlett's Test of Sphericity, $\chi^2(15) = 973.214, p < .001$

KMO = .658

Table S6. Principal Components Factor Analysis with Promax Rotation in Study 3.

Component	Component Loading		Communality
	Factor 1: Contagion	Factor 2: Concern	
Empathy	.877		.810
Behavioral Contagion	.847		.738
Personal Distress	.771		.639
Concern		.862	.686
Perspective Taking		.833	.730
Fantasy	.426	.592	.603
% of Total Variance	40.50%	29.59%	

Note: Blanks indicate loadings < |.4|

Re-analyses including Fantasy Composite in Factor 2 (Empathic Concern; Study 3)

Model	Model 1	Model 2	Model 3
Dependent Variable	Empathic Error	Empathic Error	Empathic Error
Contagion	3.36 (.50)***	3.38 (.50)***	3.51 (.51)***
Concern	-1.76 (.49)***	-2.15 (.55)***	-1.70 (.55)***
Contagion \times Concern		-2.51 (.65)***	-2.31 (.64)***
Age			-.09 (.03)*
Gender			-1.24 (.37)**
Constant	18.90 (1.63)***	19.90 (1.62)***	21.6 (2.13)***
Observations	497	498	496
Adjusted R ²	.09	.11	.14

Mediation Analyses (Study 4)

As we described in the main text, our analysis strategy for Study 4 consisted of a series of bootstrapped mediation analyses (Preacher & Hayes, 2008). In the first set of analyses, we entered each subscale of the REI as separate, individual mediators to assess for their independent contributions to emotion recognition accuracy for both contagion and concern. Each row of Table S5 is a separate mediation analysis testing for the mediator on the left as the sole mediator for the independent variable (either contagion or concern) listed in bold on the left. The dependent measure in each of these analyses was always DANVA score.

The results of these analyses suggest that both rational-ability and rational-engagement partially mediated the effect of both contagion and concern on empathic accuracy, whereas the experientiality subscales did not show any significant effects.

Table S7. Bootstrapped mediation analyses for Study 3.

	Effect of IV on M (a)	Effect of M on DV (b)	Indirect effect of M (ab)	Direct effect (c')	Total effect (c)	Mediation Type
IV: Contagion						
Rational-Ability	-.43***	1.46***	-.63*	-.70**	-1.32***	Partial
Rational-Engagement	-.37***	.78**	-.49*	-1.03***	-1.32***	Partial
Experiential-Ability	.08	.22	.017	-1.34***	-1.32***	None
Experiential-Engagement	.11*	.20	.022	-1.35***	-1.32***	None
IV: Concern						
Rational-Ability	.48***	1.25***	.60*	1.25***	1.84***	Partial
Rational-Engagement	.44***	.58*	.26*	1.58***	1.84***	Partial
Experiential-Ability	.19***	-.23	-.04	1.88***	1.84***	None
Experiential-Engagement	.17***	-.22	.038	1.88***	1.84***	None

* $p < .05$ ** $p < .01$. *** $p < .001$.

In the second set of analyses, we assessed a multiple mediation model in which all four subscales were entered as simultaneous potential mediators. As we mention in the main text, ability/engagement subscales were highly correlated with one another ($r_s > .79$), which led us to collapse across these subscales to create only two composites (rationality and experientiality). However, because we pre-registered our hypothesis using all four subscales, Table S6 provides these analyses. These findings suggest that rational-ability still mediates the effect, while the others do not exhibit an indirect effect for either contagion or concern.

Table S8. Bootstrapped multiple mediation analyses for Study 3.

	Effect of IV on M (a)	Effect of M on DV (b)	Indirect effect of M (ab)	Direct effect (c')	Total effect (c)	Mediation Type
IV: Contagion						
Rational-Ability	-.43***	1.94***	-.60*	-.72**	-1.32***	Partial
Rational-Engagement	-.37***	-.56	-.83			
Experiential-Ability	.08	-.32	.21			
Experiential-Engagement	.11*	.39	.045			
IV: Concern						
Rational-Ability	.48***	1.82***	.87*	1.33***	1.84***	Partial
Rational-Engagement	.44***	-.69	-.31			
Experiential-Ability	.19***	-.46	-.086			
Experiential-Engagement	.17***	.23	.039			

* $p < .05$ ** $p < .01$. *** $p < .001$.