

A. Name of Instrument: Interpersonal Reactivity Index (IRI)

B. Original Citation: Davis, M. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, 44(1), 113-126.

C. Brief Description / Purpose: The IRI measures four different dimensions of dispositional empathy:

- 1) The Empathic Concern subscale assesses emotional empathy, or feelings of compassion for others in distress (e.g. “*I often have tender, concerned feelings for people less fortunate than me.*”)
- 2) The Perspective Taking subscale assesses cognitive empathy, or the tendency to see the world from others’ viewpoints (e.g. “*I sometimes try to understand my friends better by imagining how things look from their perspective.*”)
- 3) The Personal Distress subscale assesses self-focused responses to others’ suffering (e.g. “*When I see someone who badly needs help in an emergency, I go to pieces.*”)
- 4) The Fantasy subscale assesses empathy for fictional characters (e.g. “*I really get involved with the feelings of the characters in a novel.*”)

These subscales should be used separately since the instrument is not intended to measure overall empathy. In fact, if researchers are only interested in one particular subscale it would be appropriate for them to only use that one. The first three are most relevant to medical settings, with better interpersonal (e.g. prosocial behavior) and intrapersonal (e.g. mental well-being) implications associated with the other-oriented subscales (Empathic Concern and Perspective Taking) compared to the self-oriented one (Personal Distress).^(1, 2)

The IRI was originally validated in college student populations but has been widely used across many populations, including medical professionals. It is a 28-item self-report questionnaire that can be administered via paper-and-pencil or online surveys. Nine items are reverse-scored (see IRI instrument). It uses a 5-item Likert scale with two anchors (A=Does not describe me well; E=Describes me very well).

D. Development and Psychometrics: The IRI covers multiple dimensions of empathy, rather than assessing global empathy. Thus, each subscale should be examined separately in analyses. The instrument does not come with a set of norms nor does it have cut-off scores. It is intended to be used as a continuous measure of empathy-related dimensions in normal populations, rather than as a categorical measure (“high empathy” versus “low empathy”). Table 1 describes the original validation studies and Table 2 gives average scores of US general adult populations and college students.

Table 1. Original IRI validation studies

Citation; Instrument details	Population characteristics	Mean scores*	Psychometric concept tested																
Original scale development paper ⁽³⁾	Study 3: 28 item version of scale N=1161 college students; 50.1% female	EC: Males: 3.72 Females: 4.10 PT: Males: 3.40 Females: 3.57 FS: Males: 3.25 Females: 3.68 PD: Males: 2.35 Females: 2.75	Factor structure: Four factors confirmed Subscale Inter-correlations: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Perspective Taking</th> <th>Personal Distress</th> <th>Fantasy</th> </tr> </thead> <tbody> <tr> <td>Empathic Concern</td> <td>.33</td> <td>.08</td> <td>.33</td> </tr> <tr> <td>Perspective Taking</td> <td>--</td> <td>-.25</td> <td>.13</td> </tr> <tr> <td>Personal Distress</td> <td></td> <td>--</td> <td>.07</td> </tr> </tbody> </table> Internal reliability: α s=.70 to .78 Test-retest reliability (60 to 75 days): Males: correlations between .61 and .79 Females: between .62 and .81		Perspective Taking	Personal Distress	Fantasy	Empathic Concern	.33	.08	.33	Perspective Taking	--	-.25	.13	Personal Distress		--	.07
	Perspective Taking	Personal Distress	Fantasy																
Empathic Concern	.33	.08	.33																
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Personal Distress		--	.07																
Original scale	N=1344 college	Not reported	Convergent validity: Correlated with other																

validation paper ⁽⁴⁾	students; 49.6% female.		empathy measures in expected ways (e.g. PT correlated with cognitive empathy measure, while EC correlated with emotional empathy measure) Concurrent validity: EC and PT associated with high self-esteem and healthy interpersonal functioning. Opposite for PD.
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*Converted to 1-5 Likert scale from summed scores. No overall means were provided.

E. Additional Studies Reporting Validity Evidence: The IRI has been widely used in a variety of populations and has been validated in several languages including Chinese,⁽⁵⁾ Dutch,⁽⁶⁾ French,⁽⁷⁾ German,⁽⁸⁾ Italian,⁽⁹⁾ Japanese,⁽¹⁰⁾ Korean,⁽¹¹⁾ Spanish,⁽¹²⁾ and Swedish⁽¹³⁾. The IRI was in the General Social Survey (GSS), a nationally representative sample of American adults, for two years. Average scores from the GSS, a large general adult online sample, and a sample of American college students are reported in Table 2. These can give readers an idea of typical score ranges.

Table 2. Mean scores for American college students and adults

Instrument details	Population characteristics	Mean scores	Findings
Empathic Concern (EC) and Perspective Taking (PT) subscales ⁽¹⁴⁾	General Social Survey (GSS): 2002 and 2004 combined): Nationally representative US adult N=2,694; 52.9% Female -Mean age = 46.29 -80.3% White -13.1% African-American (AA) -6.6% Other Online: General US adult N=81,754; 42.6% Female -Mean age = 38.56 -86.1% White -2.2% AA -6.0% Asian -2.1% Hispanic -2.8% Other	GSS: EC overall: 3.99 (0.70) Males: 3.81 (0.68) Females: 4.15 (0.67) Online: EC overall: 3.77 (0.78) Males: 3.56 (0.80) Females: 4.06 (0.64) PT overall: 3.66 (0.75) Males: 3.58 (0.77) Females: 3.77 (0.69)	We examined age-related changes in empathy, finding a curvilinear relationship: middle-aged adult females have the highest EC and PT in US.
All four subscales ⁽¹⁵⁾	US college students N=13,737; 63.1% Female -Mean age = 20.3 -67.0% White	EC: 3.80 (0.65) PT: 3.46 (0.68) FS: 3.45 (0.80) PD: 2.66 (0.71)	We examined changes over time in empathy, finding that Empathic Concern and Perspective Taking scores declined from 1980 to 2009.

F. Application to Health Sciences Education and / or Health Sciences Education Research: The IRI has been widely used within health and medical fields, on a variety of populations (e.g. medical students, residents, physicians, nurses, dentists), with a number of interesting findings that demonstrate its validity and utility within these settings. Within physicians one additional factor, “involvement,” has been found besides the typical four⁽¹⁶⁾. The commonly used Jefferson Scale of Physician Empathy is correlated with the EC, PT, and FS subscales, but not PD.⁽¹⁷⁾ Moreover, some research finds that scores on the EC and PD subscales decline during medical training,⁽¹⁸⁾ although the issue of whether empathy declines during medical training is still being debated.^(19, 20) One interesting study found that there was an increase in medical students’ perspective-taking scores after a medical humanities course, demonstrating that the PT subscale is responsive to interventions.⁽²¹⁾ Other studies find that medical residents who have lower PT and EC are more likely to subsequently report medical errors,⁽²²⁾ and higher PT is also associated with increased well-being for the physicians themselves.⁽²³⁾

There are a number of potential uses of the IRI within a medical school setting. For example, it could be used to screen prospective medical students, since normative data are available (Table 2). The IRI could also be used to better understand the pedagogical needs of medical students, since more empathic people are more responsive to emotionally evocative information and situations than less empathic people.^(24, 25) It could also be used to track medical students throughout medical school to examine changes within students across time, and perhaps make adjustments to curricula based on these results. Finally, the IRI could be administered to students before and after educational interventions to examine their efficacy.

G. Commentary: The IRI has good psychometric properties and is recommended for use in a variety of populations. There are some important points of consideration when using this scale.

- 1) The self-report nature of the scale makes it susceptible to social desirability and self-perception biases, especially for the EC and PT subscales.⁽²⁶⁾ Yet there are correlations between IRI self-reports and observer ratings (e.g. sibling, friend) of empathy⁽²⁷⁾. In addition, EC scores are correlated with prosocial behavioral outcomes, further validating the IRI, and especially the EC subscale^(28, 29).
- 2) Items in the EC subscale assess empathy for other's *suffering*, rather than a more general process of feeling what others are feeling, which could allow for feelings of empathic joy and other positive emotions.
- 3) The IRI measures dispositional, or trait-based, empathy, which means that it assesses people's chronic tendencies to empathize. Yet, the PT subscale is less heritable, and therefore, more changeable and responsive to interventions than the other subscales.⁽³⁰⁾ This instrument would not be appropriate if researchers were interested in situational empathy, which involves immediate emotional responses to others' situations (e.g. feelings of compassion, tenderness, and warmth).⁽³¹⁾
- 4) The target of empathy is not consistent across the items. For example, in the EC subscale, the target of empathy is a general needy other, but in the PT subscale, the target varies from an abstract other to specific individuals (e.g. friends).

Yet despite these considerations, the IRI's two main advantages are its excellent psychometric properties and its multidimensional approach. The multidimensional nature of the scale gives researchers and practitioners the flexibility to use the subscales that are most relevant to their project, since the different forms of empathy have different correlates and consequences.

H. Additional Citations:

1. Klimecki O, Singer T. Empathic distress fatigue rather than compassion fatigue? Integrating findings from empathy research in psychology and social neuroscience. *Pathological altruism*2011;368-83.
2. Konrath S, Grynberg D. The positive (and negative) psychology of empathy. In: Watt D, Panksepp J, editors. *The neurobiology and psychology of empathy*: Nova Science Publishers, Inc., In press; 2013.
3. Davis MH. A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology*1980;10(85).
4. Davis M. Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*1983;44(1):113-26.
5. Siu AM, Shek DT. Validation of the interpersonal reactivity index in a Chinese context. *Research on Social Work Practice*2005;15(2):118-26.
6. De Corte K, Buysse A, Verhofstadt LL, Roeyers H, Ponnet K, Davis MH. Measuring empathic tendencies: Reliability and validity of the Dutch version of the Interpersonal Reactivity Index. *Psychologica Belgica*2007;47(4):235-60.
7. Gilet A-L, Mella N, Studer J, Grün D, Labouvie-Vief G. Assessing dispositional empathy in adults: A French validation of the Interpersonal Reactivity Index (IRI). *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement*2013;45(1):42.
8. Paulus C. The Saarbruecken personality questionnaire on empathy: psychometric evaluation of the German version of the Interpersonal Reactivity Index. Retrieved from <http://psydok.sulb.uni-saarland.de/volltexte/2009/2363>; 2009.
9. Sartori R, Meneghini AM. Caratteristiche psicometriche dell'Iri di Davis. *DiPAV-Quaderni*2008.

10. Aketa H. Structure and measurement of empathy: Japanese version of Davis's Interpersonal Reactivity Index (IRI-J). *The Psychological report of Sophia University*1999;2:19-31.
11. Kang I, Kee S, Kim SE, Jeong B, Hwang JH, Song JE, Kim JW. Reliability and validity of the Korean-version of Interpersonal Reactivity Index. *Journal of Korean Neuropsychiatric Association*2009;48(5):352-8.
12. Pérez-Albéniz A, De Paúl J, Etxeberria J, Paz Montes M, Torres E. Adaptación de Interpersonal reactivity Index (IRI) al español. *Psicothema*2003;15(2):267-72.
13. Cliffordson C. The hierarchical structure of empathy: Dimensional organization and relations to social functioning. *Scandinavian Journal of Psychology*2002;43(1):49-59.
14. O'Brien E, Konrath SH, Grühn D, Hagen AL. Empathic concern and perspective taking: Linear and quadratic effects of age across the adult life span. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*2013;68(2):168-75.
15. Konrath S, O'Brien E, Hsing C. Changes in dispositional empathy in American college students over time: a meta-analysis. *Personality and Social Psychology Review*2011 May;15(2):180-98.
16. Yarnold P, Bryant F, Nightingale S, Martin G. Assessing physician empathy using the Interpersonal Reactivity Index: A measurement model and cross-sectional analysis. *Psychology, Health & Medicine*1996;1(2):207-21.
17. Hojat M, Mangione S, Kane GC, Gonnella JS. Relationships between scores of the Jefferson scale of physician empathy (JSPE) and the interpersonal reactivity index (IRI). *Medical Teacher*2005;27(7):625-8.
18. Bellini LM, Shea JA. Mood change and empathy decline persist during three years of internal medicine training. *Academic Medicine*2005;80(2):164.
19. Colliver JA, Conlee MJ, Verhulst SJ, Dorsey JK. Reports of the decline of empathy during medical education are greatly exaggerated: A reexamination of the research. *Academic Medicine*2010;85(4):588-93.
20. Neumann M, Edelhäuser F, Tauschel D, Fischer MR, Wirtz M, Woopen C, Haramati A, Scheffer C. Empathy Decline and Its Reasons: A Systematic Review of Studies With Medical Students and Residents. *Academic Medicine*2011;86(8):996-1009 10.97/ACM.0b013e318221e615.
21. Shankar PR, Piryani RM. Changes in empathy among first year medical students before and after a medical humanities module. *Education in Medicine Journal*2013;5(1).
22. West CP, Huschka MM, Novotny PJ, Sloan JA, Kolars JC, Habermann TM, Shanafelt TD. Association of perceived medical errors with resident distress and empathy. *JAMA: The Journal of the American Medical Association*2006;296(9):1071-8.
23. Shanafelt TD, West C, Zhao X, Novotny P, Kolars J, Habermann T, Sloan J. Relationship Between Increased Personal Well-Being and Enhanced Empathy Among Internal Medicine Residents. *Journal of General Internal Medicine*2005;20(7):559-64.
24. Davis MH, Hull JG, Young RD, Warren GG. Emotional reactions to dramatic film stimuli: the influence of cognitive and emotional empathy. *Journal of Personality and Social Psychology*1987 Jan;52(1):126-33.
25. Campbell RG, Babrow AS. The role of empathy in responses to persuasive risk communication: Overcoming resistance to HIV prevention messages. *Health Communication*2004;16(2):159-82.
26. Watson P, Morris RJ. Narcissism, empathy and social desirability. *Personality and Individual Differences*1991;12(6):575-9.
27. Saroglou V, Pichon I, Trompette L, Verschuere M, Dernelle R. Prosocial behavior and religion: New evidence based on projective measures and peer ratings. *Journal for the Scientific Study of Religion*2005;44(3):323-48.
28. Davis M. The effects of dispositional empathy on emotional reactions and helping: A multidimensional approach. *Journal of Personality*1983;51(2):167-84.
29. Davis MH. Empathic Concern and the Muscular Dystrophy Telethon Empathy as a Multidimensional Construct. *Personality and Social Psychology Bulletin*1983;9(2):223-9.
30. Davis M, Luce C, Kraus SJ. The heritability of characteristics associated with dispositional empathy. *J Pers*1994 Sep;62(3):369-91.
31. Batson CD, Fultz J, Schoenrade PA. Adults' emotional reactions to the distress of others. Empathy and its development1987:163-84.

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