

Henry Ford Health

## Henry Ford Health Scholarly Commons

---

Internal Medicine Articles

Internal Medicine

---

10-1-2015

### Internship and Empathy: Variations Across Time and Specialties

Sameer K. Avasarala

*Henry Ford Health*, SAVASAR1@hfhs.org

Sarah Whitehouse

*Henry Ford Health*, swhiteh1@hfhs.org

Sean Drake

*Henry Ford Health*, sdrake1@hfhs.org

Follow this and additional works at: [https://scholarlycommons.henryford.com/internalmedicine\\_articles](https://scholarlycommons.henryford.com/internalmedicine_articles)

---

#### Recommended Citation

Avasarala SK, Whitehouse S, and Drake SM. Internship and empathy: Variations across time and specialties. *South Med J* 2015; 108(10):591-595.

This Article is brought to you for free and open access by the Internal Medicine at Henry Ford Health Scholarly Commons. It has been accepted for inclusion in Internal Medicine Articles by an authorized administrator of Henry Ford Health Scholarly Commons.

# Internship and Empathy: Variations Across Time and Specialties

Sameer K. Avasarala, MD, Sarah Whitehouse, MAW, and Sean M. Drake, MD

**Objectives:** To assess whether any differences exist in Interpersonal Reactivity Index (IRI) scores among postgraduate year 1 (PGY-1) residents across specialties.

**Methods:** PGY-1 residents representing 11 specialties at our academic institution were invited to take a Web-based IRI survey at three time points. The specialties were condensed into several binary groups for analysis: internal medicine (IM) versus non-IM; primary care (IM, family medicine) versus nonprimary care; emergency medicine (EM, including the combined IM/EM) versus non-EM; surgical specialties (general surgery, obstetrics and gynecology, otolaryngology, orthopedics, urology) versus nonsurgical specialties (EM, family medicine, IM, neurology, pathology, and psychiatry); men versus women; and age groups. A repeated-measures generalized-estimating equations approach was taken to analyze the effect of specialty and time on each of the four IRI subscales.

**Results:** Of 94 PGY-1 residents invited to participate at each time point, 74 (77.1%) completed the survey at least once. Response rates at each time point were similar (mean 47.9%). When comparing the IM ( $n = 35$ ) and non-IM ( $n = 39$ ) groups, the perspective-taking subscale was found to be significantly lower in the non-IM group ( $P = 0.006$ ). Among male ( $n = 46$ ) versus female residents ( $n = 26$ ), the personal-distress subscale was significantly different overall ( $P = 0.041$ ) but not among time points. No other significant differences were found between groups. The conglomerate subscale scores throughout the year did not show a dramatic change.

**Conclusions:** Our study of IRI subscales in PGY-1 residents showed no major difference among specialties across 1 year except for IM residents, who scored significantly higher (more favorably) in the

perspective-taking subscale. Contrary to previous studies, we did not observe a substantial decline in the empathic concern subscale IM residents over their first year.

**Key Words:** empathy, internship, graduate medical education, Interpersonal Reactivity Index

Empathy is a key component of a healthy doctor–patient relationship. The Accreditation Council for Graduate Medical Education’s Next Accreditation System scores respect, compassion, and empathy on an objective scale from novice to expert<sup>1</sup> under the core competency of professionalism. The American Board of Internal Medicine’s milestones for internal medicine (IM) also emphasize the importance of empathy.<sup>2</sup> Empathy may be considered an important part of rapport and advocacy in the doctor–patient relationship. Poor rapport may lead to insufficient follow-up and noncompliance issues,<sup>3</sup> and advocacy for a patient, for which a physician is responsible,<sup>4</sup> would be difficult without empathy as a driving force.

Multiple studies have attempted to evaluate empathy in residents using various psychological tests, such as Profile of Mood States, the Self-Rating Depression Scale, and the Interpersonal Reactivity Index (IRI).<sup>5–7</sup> The 28-item IRI survey, which uses a 4-point Likert scoring system, has been validated as an objective measure of empathy using four subscales: an empathic concern (EC) scale to measure emotive response; a perspective-taking (PT) scale to measure the ability to understand another’s perspective; a fantasy (F) scale for the ability to imagine another’s situation and feelings; and a personal distress (PD) scale for one’s own discomfort arising from witnessing another’s experience.<sup>8</sup> Higher scores for EC, PT, and F are favorable whereas a lower score in PD is more favorable.

From the Departments of Internal Medicine, Medical Education, and Medicine Henry Ford Hospital, Detroit, Michigan.

Correspondence to Dr Sameer Avasarala, Department of Internal Medicine, Henry Ford Hospital, 2799 W Grand Blvd, Detroit, MI 48202. E-mail: savasar1@hfhs.org. To purchase a single copy of this article, visit [sma.org/southern-medical-journal](http://sma.org/southern-medical-journal). To purchase larger reprint quantities, please contact [reprints@wolterskluwer.com](mailto:reprints@wolterskluwer.com).

The authors have no financial relationships to disclose and no conflicts of interest to report.

Accepted July 13, 2015.

Copyright © 2015 by The Southern Medical Association

0038-4348/0–2000/108-591

DOI: 10.14423/SMJ.0000000000000347

## Key Points

- When measured via the Interpersonal Reactivity Index, levels of empathic concern are not the same among interns of different specialties.
- Contrary to prior research, there is evidence of an increase in some subscale scores of the Interpersonal Reactivity Index through the first year of graduate medical education.
- A large multicenter study is needed to identify potential causes of change in empathic concern, including sex, age, and region of training.

Higher PD scores have been shown to positively correlate with aggression and antisocial behavior.<sup>9</sup> Because of the multidimensional construct of the IRI, the subscales were meant to be interpreted individually, not as a total sum.<sup>10</sup> Reference standards for IRI scores were established using a college student population.<sup>8</sup>

Studies that used IRI to assess the empathy of residents reported a decline in some subscales over time. In a longitudinal study, Bellini et al found that both PT and EC mean scores dropped as the year progressed among IM postgraduate year 1 (PGY-1) interns<sup>7</sup> and that EC continued to decline during the 3-year residency.<sup>11</sup> Others showed that EC scores declined as IM PGY-1 residents progressed to their second year of training.<sup>12</sup> The importance of empathy was indicated in a cross-sectional survey that showed an association of mental well-being among IM residents with enhanced resident empathy.<sup>13</sup>

Although data suggest that EC declines among IM residents as their training progresses, no studies have used the IRI to compare empathy in residents across multiple specialties. We undertook this single-center study using the IRI tool to determine whether any difference exists in IRI subscale scores in first-year residents of various specialties. Because IRI reference norms were based on a college student population, this study also aimed to compare IRI scores between our IM residents with those of other IM residents previously reported.

## Methods

A total of 127 PGY-1 residents across 15 specialties started training at our urban academic center in June 2013. Thirty-three of these residents were excluded from the study. Four specialties were excluded because their first year of training mainly comprised rotations not well representative of their respective training field and future career: anesthesiology (n = 8), categorical radiation oncology (n = 1), radiology (n = 9), and transitional year (n = 13). One resident was excluded for repeating PGY-1 training because of a change in specialty. Another resident was excluded because of being an investigator in this study.

After exclusion, 94 PGY-1 residents representing 11 specialties were invited to participate in the study: IM, emergency medicine (EM, including the combined EM/IM), family medicine, general surgery, neurology, orthopedics, obstetrics and gynecology, otolaryngology, pathology, psychiatry, and urology. The EM/IM PGY-1 residents were grouped with EM because graduates from EM/IM dual programs tend to practice EM solely after residency.<sup>14</sup>

Invitations to participate in the study were sent via institutional e-mail, which contained instructions and a link to the online IRI survey. Each invitee was assigned a unique identifier code to access the IRI to enable tracking of enrollee responses over time while maintaining participants' anonymity. Each time the IRI survey link was clicked, informed consent had to be acknowledged before the participant could proceed. Data were collected at three time points (November 2013, February 2014, and June 2014). All 94 participants were sent an e-mail

invitation at each time point. At each time point, the online IRI survey was available for 2 weeks; an e-mail reminder was sent 1 week after each invitation to encourage participation.

As part of the longitudinal study design, data were collected at an individual level via the unique code. The Web-based software IRI was designed to track each individual's responses over time and enabled the participants to take the survey on handheld devices. Participants had the option to answer a set of demographic questions: sex, age (three categories), and specialty of training. Participant answers were linked with their unique identifier so demographic questions were only answered once. This study was approved by our health system's institutional review board.

## Data Analysis

Because of the small number of PGY-1 residents per specialty, the 11 specialties were condensed into multiple binary groups for analysis: IM versus non-IM; primary care (IM and family medicine) versus nonprimary care; EM versus non-EM; surgical (general surgery, obstetrics and gynecology, orthopedics, otolaryngology, and urology) versus nonsurgical; men versus women; and age groups.

Data were described using counts, percentages, adjusted means, and standard errors (SE). A repeated-measures generalized-estimating equations approach was taken to analyze the effect of specialty and time on each of the four IRI measures (EC, PT, F, and PD). This was done to account for the lack of independence between responses given by the same resident across three time periods. A compound-symmetry structure was used because of constant variance and covariance. Statistical significance was set at  $P < 0.05$  and all of the analyses were performed using SAS 9.4 (SAS Institute Inc, Cary, NC).

## Results

Of the 94 PGY-1 residents invited to participate at each time point, 74 residents (77.1%) took the survey at least once. Response rates at each time point were similar (47%, 51%, and 45%). A total of 44 (47%) residents took the survey at two time points and 22 (23%) completed the survey at all three time points. The demographic characteristics of the study participants are presented in Table 1.

When comparing the IM (n = 35) and non-IM (n = 39) groups, only the PT scale was found to be statistically significant ( $P = 0.006$ ; Table 2). The IM group showed a favorable increase in PT score across time, whereas the non-IM group remained the same (Table 2).

The PD scale was found to be significantly different overall between men (n = 46) and women (n = 26) ( $P = 0.041$ ; Table 3), but this finding was no longer significant under subsequent stratified analyses by time phase and sex.

No statistically significant differences in IRI subscale scores were found among the primary care versus nonprimary care, EM versus non-EM, surgical versus nonsurgical, or among age groups.

**Table 1. Participant demographics (N=74)**

Variable	Response	N (%)
Sex	Male	46 (62.2)
	Female	26 (35.1)
	Withheld	2 (2.7)
Age, y	20–25	5 (6.8)
	26–30	60 (81.1)
	>30	7 (9.5)
	Withheld	2 (2.7)
Specialty	EM/IM	13 (17.6)
	Otolaryngology	2 (2.7)
	Family medicine	4 (5.4)
	Internal medicine	35 (47.3)
	Neurology	4 (5.4)
	Orthopedics	2 (2.7)
	Obstetrics and gynecology	3 (4.1)
	Pathology	3 (4.1)
	Psychiatry	3 (4.1)
	Surgery	4 (5.4)
	Urology	1 (1.4)

EM/IM, emergency medicine/internal medicine.

The conglomerate scores from all of the specialties also were analyzed (Fig.). The conglomerate scores for EC, PT, and F subscales showed an increase of 0.1, 1.6, and 0.3, respectively, between the first and last time points. The conglomerate PD score showed minimal change through the year (increase of 0.1).

When comparing our PGY-1 residents' IRI mean scores with IRI reference norms,<sup>5</sup> differences were observed in all of the subscales. This difference was most pronounced with the EC score: 13.4/–8.3/–5.6 (conglomerate mean/difference

**Table 2. Internal medicine vs noninternal medicine Interpersonal Reactivity Index subscale scores**

Variable	Group <sup>a</sup>	Time point <sup>b</sup>			P
		1	2	3	
EC	Other	13.1 (0.6)	13.9 (0.5)	12.9 (0.5)	0.808
	IM	13.0 (0.6)	14.1 (0.5)	13.5 (0.6)	
PT	Other	16.7 (0.6)	16.0 (0.7)	16.6 (0.6)	<b>0.006</b>
	IM	14.1 (0.7)	17.5 (0.6)	17.4 (0.7)	
FS	Other	14.1 (0.8)	15.5 (0.8)	14.1 (0.8)	0.352
	IM	13.6 (0.8)	13.7 (0.7)	14.2 (0.9)	
PD	Other	12.0 (0.7)	11.9 (0.7)	12.4 (0.7)	0.609
	IM	11.6 (0.7)	10.5 (0.6)	11.4 (0.8)	

IM, n = 35; other, n = 39. Bold type indicates statistical significance. EC, empathic concern; F, fantasy; IM, internal medicine; PD, personal distress; PT, perspective taking.

<sup>a</sup>Other, all participating specialties that are not internal medicine.

<sup>b</sup>Time point 1 (November 2013), time point 2 (February 2014), time point 3 (June 2014).

**Table 3. Male versus female Interpersonal Reactivity Index scores**

Variable	Group	Time point <sup>a</sup>			P
		1	2	3	
EC	Female	14.2 (0.6)	14.8 (0.6)	13.5 (0.6)	0.347
	Male	12.3 (0.5)	13.6 (0.4)	12.9 (0.5)	
PT	Female	14.3 (0.8)	16.8 (0.8)	16.6 (0.8)	0.443
	Male	16.0 (0.6)	16.8 (0.6)	17.1 (0.6)	
FS	Female	14.1 (1.0)	14.1 (1.0)	13.6 (1.0)	0.689
	Male	13.8 (0.7)	14.8 (0.7)	14.4 (0.7)	
PD	Female	12.8 (0.8)	10.3 (0.8)	11.4 (0.8)	<b>0.041</b>
	Male	11.0 (0.6)	11.3 (0.6)	12.1 (0.6)	

Female, n = 26; male, n = 46; withheld, n = 2. Bold type indicates statistical significance. EC, empathic concern; F, fantasy; PD, personal distress; PT, perspective taking.

<sup>a</sup>Time point 1 (November 2013), Time point 2 (February 2014), Time point 3 (June 2014).

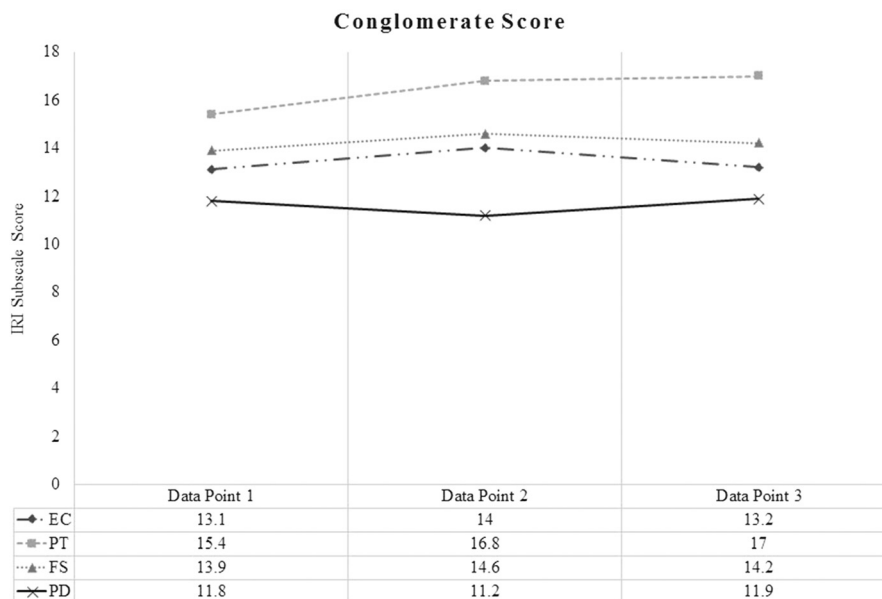
from female reference value/difference from male reference value). When compared with results from a previous study, our first-year IM residents had a lower mean PT score (16.3 vs 20.3), a lower mean EC score (13.5 vs 22.0), and a higher mean PD score (11.2 vs 8.8).<sup>7</sup>

## Discussion

Our study of empathy in 74 first-year residents found a statistically significant difference only in the IRI perspective-taking (cognitive) scale between IM and non-IM groups at a single institution across 1 year. The IM group's PT mean score increased by 3.3 to an endpoint of 17.4 (0.7 SE), whereas the non-IM group's PT score declined by 0.1 to 16.6 (0.6 SE). In their study of 61 IM residents, Bellini et al reported a decline in PT by 0.77 (from 20.25 to 19.48), EC by 1.25 (22 to 20.75), and an increase in PD (reflecting a decline) by 1.97 (8.68 to 10.65).<sup>7</sup> The F scale was not reported.

Whereas others found a decline in EC for first-year IM residents,<sup>8,10</sup> our study showed no statistically significant change in EC scores for any group (first data point vs last data point): 13.0 to 13.5 for IM versus 13.1 to 12.9 for non-IM; 13 to 13.2 for primary care versus 13.2 to 13.0 for nonprimary care; 12.4 to 12.8 for EM versus 13.2 (no change noted) for non-EM; 12.9 to 14.0 for surgical versus 13.1 (no change) for nonsurgical; and 14.2 to 13.5 for women versus 12.3 to 12.9 for men.

The approximately seven-point difference in EC mean scores between ours and other reported studies was an unexpected finding. The reason for this difference is unknown and could be the result of a multitude of factors, including the geographic area of training, type of teaching program (community-based hospital vs community-based university-affiliated hospital vs university-based), selection of electives, and structure of the PGY-1 schedule. Unlike the environment of previously reported studies, our study was performed at a large, urban medical center



**Fig.** The conglomerate scores show the change in the Interpersonal Reactivity Index subscales for all participating residents through their first year of training. Data point 1 (November 2013), data point 2 (February 2014), data point 3 (June 2014). EC, empathic concern; FS, fantasy score; PD, personal distress; PT, perspective taking.

with 39% non-US/foreign graduate residents, which may reflect greater diversity and/or a multicultural effect in relation to how empathy is perceived and displayed. These findings may raise the possibility that residents from various types of residency program locales and ethnic backgrounds may score differently on IRI empathy scales.

Although yet to be studied thoroughly among residents, previous studies have considered ethnic background as a factor affecting empathic concern in undergraduate medical education. A study by Youssef et al using the Jefferson Scale of Empathy (JSE) Medical Student version among medical students in the West Indies showed differences in mean scores during a 5-year period among students of different ethnic backgrounds.<sup>15</sup> The JSE Medical Student version also was used to measure empathy among second-year medical students in Italy (all of them being white). When compared, results from the Italian study showed somewhat higher mean scores than the population observed in the West Indies study (108.71 vs 106.69).<sup>15,16</sup>

In addition to ethnic diversity, another difference in our study, compared with previous reports on empathy in residents, is that ours was the first IRI empathy study to be reported since the implementation of the duty-hour regulations in 2011.<sup>17</sup> This may explain in part why EC scores in our groups did not decline significantly as it did in the other studies.

This study has limitations. We were underpowered to measure statistically significant differences among each specialty. This limitation was partially mitigated by combining the results into the selected binary groups. Although obstetrics and gynecology has been designated as a primary care specialty by the US Department of Health and Human Services,<sup>18</sup> we categorized it as a surgical specialty because of its recognition by the

American College of Surgeons.<sup>19</sup> We performed statistical analyses using either designation but found no differences in results based on designation. Another limitation of this study is its single-center setting; however, in contrast to similar studies completed at other academic hospitals, we believe our sample population is more diverse and may provide a better representation of the healthcare workforce in the United States. This results from our substantial proportion of international medical graduates in training. We consider this point to be of importance because international medical graduates account for approximately 25% of the physician workforce in the United States.<sup>20</sup>

We selected the IRI survey because it is a validated tool to quantify empathy and is the only published tool that allows for measurement of empathy via a multidimensional approach.<sup>21</sup> Although other scales were specifically designed to measure empathy among healthcare professionals and students (eg, JSE), they are not as widely used as the IRI. One study, however, reported that the JSE was more accurate in measuring empathy among physicians.<sup>22</sup>

## Conclusions

Our single-center study showed a difference in the PT scale of empathy between IM and non-IM first-year residents and an overall slight difference in the PD scale between men and women. Unlike others, we did not observe a significant decline in the EC scale among IM residents as the year progressed. Further studies are needed to identify potential causes of change in empathy and to address cultural differences, as well as to attempt to establish baseline reference ranges for medical residents overall. As a next step, some specialties may benefit from more focused training, seminars, or interactive

educational sessions as a form of sensitivity training geared toward potentially raising the levels of empathy.

## Acknowledgments

The authors thank William Morse, MS, Meredith G. Mahan, MS, and Stephanie Stebens, MLIS, AHIP, for their assistance with this project and manuscript preparation. Meredith Mahan, Department of Public Health Sciences, Henry Ford Health System, performed statistical analyses.

## References

1. Nasca TJ, Philibert I, Brigham T, et al. The next GME accreditation system—rationale and benefits. *N Engl J Med* 2012;366:1051–1056.
2. Green ML, Aagaard EM, Caverzagie KJ, et al. Charting the road to competence: developmental milestones for internal medicine residency training. *J Grad Med Educ* 2009;1:5–20.
3. Kerse N, Buetow S, Mainous AG 3rd, et al. Physician-patient relationship and medication compliance: a primary care investigation. *Ann Fam Med* 2004;2:455–461.
4. American Medical Association Council on Ethical and Judicial Affairs. Fundamental elements of the patient-physician relationship. *JAMA* 1990;264:3133.
5. Kirsling RA, Kochar MS, Chan CH. An evaluation of mood states among first-year residents. *Psychol Rep* 1989;65:355–366.
6. Gordon GH, Hubbell FA, Wyle FA, et al. Stress during internship: a prospective study of mood states. *J Gen Intern Med* 1986;1:228–231.
7. Bellini LM, Baime M, Shea JA. Variation of mood and empathy during internship. *JAMA* 2002;287:3143–3146.
8. Davis MH. A multidimensional approach to individual differences in empathy. *JSAS Cat Selected Documents Psychol* 1980;10:85.
9. Beven JP, O'Brien-Malone A, Hall G. Using the interpersonal reactivity index to assess empathy in violent offenders. *Int J Forensic Psychol* 2004;1:33–41.
10. Davis MH. Measuring individual differences in empathy: evidence for a multidimensional approach. *J Pers Soc Psychol* 1983;44:113–126.
11. Bellini LM, Shea JA. Mood change and empathy decline persist during three years of internal medicine training. *Acad Med* 2005;80:164–167.
12. West CP, Huntington JL, Huschka MM, et al. A prospective study of the relationship between medical knowledge and professionalism among internal medicine residents. *Acad Med* 2007;82:587–592.
13. Shanafelt TD, West C, Zhao X, et al. Relationship between increased personal well-being and enhanced empathy among internal medicine residents. *J Gen Intern Med* 2005;20:559–564.
14. Kessler CS, Stallings LA, Gonzalez AA, et al. Combined residency training in emergency medicine and internal medicine: an update on career outcomes and job satisfaction. *Acad Emerg Med* 2009;16:894–899.
15. Youssef FF, Nunes P, Sa B, et al. An exploration of changes in cognitive and emotional empathy among medical students in the Caribbean. *Int J Med Educ* 2014;5:185–192.
16. Leombruni P, Di Lillo M, Miniotti M, et al. Measurement properties and confirmatory factor analysis of the Jefferson Scale of Empathy in Italian medical students. *Perspect Med Educ* 2014;3:419–430.
17. Accreditation Council for Graduate Medical Education Task Force on Quality Care and Professionalism. Appendix E: resident duty hours in the learning and working environment: comparison of 2003 and 2011 standards. In: Philibert I, Amis S Jr, eds. *The ACGME 2011 Duty Hour Standards: Enhancing Quality of Care, Supervision, and Resident Professional Development*. Chicago: ACGME; 2011:109–114.
18. US Department of Health and Human Services, National Health Service Corps. Students to service FAQs. <http://nhsc.hrsa.gov/currentmembers/studentstoservice/faqs>. Accessed July 17, 2015.
19. Vogt VY. Obstetrics and gynecology. <https://www.facs.org/education/resources/residency-search/specialties/obgyn>. Accessed June 8, 2015.
20. American Medical Association. IMGs in the United States. 2014. <http://www.ama-assn.org/ama/pub/about-ama/our-people/member-groups-sections/international-medical-graduates/imgs-in-united-states.page#>. Accessed January 20, 2015.
21. Rogers K, Dziobek I, Hassenstab J, et al. Who cares? Revisiting empathy in Asperger syndrome. *J Autism Dev Disord* 2007;37:709–715.
22. Hojat M, Mangione S, Kane GC, et al. Relationships between scores of the Jefferson Scale of Physician Empathy (JSPE) and the Interpersonal Reactivity Index (IRI). *Med Teach* 2005;27:625–628.