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Association between dispositional empathy and self-other distinction in Irish and Belgian medical students: a cross-sectional analysis

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ABSTRACT

Objective Physicians' cognitive empathy is associated with improved diagnosis and better patient outcomes. The relationship between self-reported and performance-based measures of cognitive empathic processes is unclear.

Design Cross-sectional analysis of the association between medical students' empathy scale scores and their empathic performance in a visuospatial perspective-taking (VPT) task.

Participants Undergraduate medical students across two European medical schools (n=194).

Primary and secondary outcome measures Two self-report empathy and one performance-based perspective-taking outcome: Jefferson Scale of Physician Empathy (JSPE); Empathy Quotient (EQ); Samson's level-1 VPT task.

Results Higher scores on the 'standing in patient's shoes' subscale of the JSPE were associated with a lower congruency effect (as well as lower egocentric and altercentric biases) in the VPT (B=−0.007, 95% CI=−0.013 to 0.002, p<0.05), which reflects an association with better capacity to manage conflicting self-other perspectives, also known as self-other distinction. Lower egocentric bias was also associated with higher scores on the 'social skills' EQ subscale (B=−10.17, 95% CI=−17.98 to 2.36, p<0.05). Additionally, selection of a 'technique-oriented' clinical specialty preference was associated with a higher self-perspective advantage in the VPT, reflecting greater attentional priority given to the self-perspective.

Conclusions We show that self-assessment scores are associated with selected performance-based indices of perspective taking, providing a more fine-grained analysis of the cognitive domain of empathy assessed in medical student empathy scales. This analysis allows us to generate new critical hypotheses about the reasons why only certain self-report empathy measures (or their subscales) are associated with physicians' observed empathic ability.

INTRODUCTION

High levels of physician empathy are positively correlated with various indices of patient-centred care, including improved outcomes, treatment compliance, patient satisfaction as well as a reduction in medico-legal cases.[1–4] Conversely, lower levels of empathy are often

Strengths and limitations of this study

► This study measures and compares for the first time in medical students performance-based measures of cognitive empathic processes via a visuospatial perspective-taking paradigm, alongside widely used self-report scales.

► This study was conducted in undergraduate medical students across two European medical schools.

► Examining correlations between observed perspective-taking performance and specific subscales of self-report empathy measures in this study have informed on the relationship between self-report and observed empathic ability of medical students and physicians.

► One limitation of this study relates to the face validity of the visuospatial perspective-taking task in a healthcare context, as the task does not focus on doctor-patient interactions.

associated with a higher rates of physician burnout,[5–7] which may be expected to impact negatively on patient care.[8]

The design of appropriate tools to measure physician empathy is undermined by several theoretical and methodological issues that have led researchers to observe inconsistent and inconclusive relationships between empathy scale scores and actual empathic behaviour in simulated or clinical settings.[9–11] The first issue is that there is a lack of consensus regarding the conceptual structure of empathy and thus the way to measure empathy.[12] In a clinical context, empathy is multidimensional, including affective, cognitive and behavioural components.[13] Affective empathy refers to the ability to experience an emotional reaction to the experience of another person.[14] The capacity to identify and understand another's psychological perspective is referred to as cognitive empathy. The behavioural component reflects the physician's ability to communicate, and act on, that

understanding of the patient's mental condition.[13 15] The most widely used self-report measure of medical student empathy, the Jefferson Scale of Physician Empathy (JSPE),[16] focuses essentially on the cognitive component of empathy, with three subscales: the 'perspective taking', 'compassionate care' (understanding of patients' emotions and experiences) and 'standing in patient's shoes' (ability to see things from the patients' perspective).[17 18]

The second issue is that research on assessment of medical student empathy has principally relied on self-report instruments. This approach has been criticised for several reasons including poor agreement between self-report and faculty observations,[19 20] weak correlation between self-assessed and standardised patient measures of physician empathy[21] as well as lack of measurement and conceptual comparability across instruments.[15 22] Hence, these issues raise justifiable concerns concerning the meaning of these scales in the context of their widespread use in medical education.

The third issue is that the instruments used to measure the same component of empathy actually focus on distinct aspects. For instance, cognitive empathy can be measured in terms of skills, habits, motivation or adherence to underlying moral values. Hence, poor correlations between conceptually similar subscales across different measures, for example, 'perspective taking' across both the JSPE and alternative scales (eg, Interpersonal Reactivity Index (IRI)[23]) have been reported.[24] Relatedly, certain authors have also noted that the distinction between the JSPE subscales 'perspective taking' and 'standing in the patient's shoes' is unclear and that they may represent the same underlying factor.[25]

The present study aimed to examine empathy among medicine students while addressing the three aforementioned issues by combining two self-report instruments and a performance-based measure, the latter being a visuospatial perspective-taking (VPT) task, which is exploited for the first time to measure psychological processes intrinsic to cognitive empathy in medical students.

Cognitive empathy is dependent on both an unambiguous awareness of self-other distinction and the mental flexibility to adopt the subjective perspective of the other.[26] Effective physician-patient communication is dependent on the ability to infer the knowledge and perceptions of the patient regarding the ongoing interaction and their proximal clinical environment. It also involves the physician being able to successfully distinguish his/her perspective on the consultation from that of the patient. These processes can be measured using a VPT task, where the first-person perspective is contrasted with the view of a third-person avatar, which may or may not be congruent with the research participant's viewpoint. VPT allows us to understand and interact with other social beings by accurately determining how and what they see in their environment.[27] Perspective-taking performance in this task requires identifying and representing another person's visual experience, and correctly choosing the

goal-relevant perspective when the self-perspective and third-person perspective are incongruent.[27 28] Previous studies have reported that VPT performance is associated with increased empathy (measured using the IRI) in college students.[29 30] Here, we employed an existing level-1 perspective-taking task[27 30] to examine the relationship between perspective congruence and prioritisation of self-perspective versus other-person perspective and medical students' responses in two self-report empathy measures, the JSPE,[16] and the Empathy Quotient (EQ[31]). We hypothesised that higher perspective-taking performance (via the VPT) would be associated with higher empathy scores, particularly across subscales measuring cognitive empathic processes, in medical students.

METHODS

Study design and participants

This study was conducted in University College Cork (UCC) and University of Louvain (UCLouvain) medical school in a cohort of 194 students who had at least one full-time clinical placement as part of their medical curriculum, during the first half of the academic years 2017/2018 and 2018/2019 (M_{age}=24.27, SD=2.83; 128 females). The School of Medicine at UCC offers a systems-based integrated undergraduate curriculum with early patient contact and full-time clinical placements in the latter 2.5 years of the programme. At UCLouvain, the 6-year undergraduate programme is phased across two 3-year cycles with an increasing degree of acquired competences and clinical exposure. The inclusion criterion for the UCC students was to be in the latter 2.5 years of their undergraduate curriculum in order for them to have clinical experience. The inclusion criterion for the UCLouvain students was to be at least in their fourth year (second cycle) in order for them to have clinical experience, with no maximal limit of years. It was not appropriate or possible to involve patients or the public in the design, or conduct, or reporting or dissemination plans of our research.

Patient and public involvement

No patient was involved.

Instruments

Jefferson Scale of Physician Empathy

The student version of the JSPE was used to measure the empathy in medical students. It is a self-administered tool that contains 20 items across three subscales ('perspective taking', 'compassionate care' and 'standing in patient's shoes') answered on a 7-point Likert-type scale.[16] The JSPE total score ranges from 20 to 140, with higher values indicating a higher degree of empathy.[11 15 32–35]

Empathy Quotient

Initially designed to measure empathy in individuals with individuals who exhibit autistic traits, and validated in a clinical sample,[31] the EQ scale is a 60-item questionnaire,

The number of discs visible from the <u>other</u> person's perspective and <u>self</u>-perspective are:
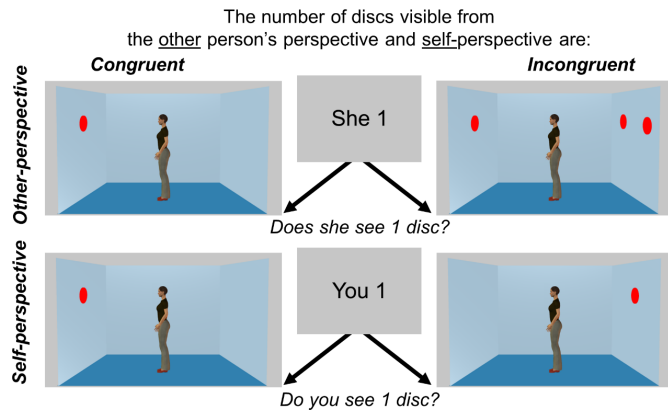
Figure 1 Schematic of the visual perspective-taking task, which compares speed and accuracy performance between, on one hand, the congruent and incongruent perspectives trials and, on the other hand, the other-perspective and self-perspective trials. The correct answer for the four trials shown here is 'yes/match'.

where each item is a first-person statement which the study participant must rate as either 'strongly agree', 'slightly agree', 'slightly disagree' or 'strongly disagree'. Previous factor-analytic studies distinguished three EQ subscales labelled 'cognitive empathy', 'emotional empathy' and 'social skills'.[31]

VPT task

The VPT task used in this study has been described previously[27] and correlates well with self-reported everyday life perspective-taking tendencies.[30] In this computer-based task, participants view pictures of a human avatar positioned in the centre of a room with zero to three red discs displayed on one or two of the side walls (see figure 1). The avatar is viewed sideways facing either the left or the right wall. The task involves deciding whether a prompted number (ranging from 0 to 3) matches or mismatches the number of discs visible from a prompted target perspective, which could be either the participant's perspective (self-perspective condition) or the avatar's perspective (other-perspective condition, ie, what number of discs are visible from the avatar's viewpoint). The number of discs visible could be the same for both perspectives (congruent perspectives condition) or different (incongruent perspectives condition). Reaction time (RT) and error rates were collected.

The following four indices (1–4) of VPT performance were computed based on previous works.[27–30 36–39] For all these indices, a higher score equates to lower VPT performance as it indicates either more biased cognition (1–3) or more self-centred cognition (2 and 4).

(1) The *congruency effect* reflects the extent of bias (or interference) caused by the irrelevant conflicting perspective, and captures the difficulty to handle conflicting perspectives and self-other distinction.

(2 and 3) The *egocentric* and *altercentric biases* are the extent of biases separately for self-perspective and avatar's perspective trials, and capture, respectively, the ability to

adopt someone else's perspective without being erroneously influenced by our own point of view and the ability to evaluate one's own perspective without being erroneously influenced by someone else's point of view.

(4) The *self-perspective advantage* is the extent of performance advantage at judging from the self-perspective over the avatar's perspective, and captures the attentional priority given to the self-perspective, also referred to as self-centeredness or egocentricity.

A questionnaire was also administered which collected sociodemographic and educational/career details of the participants, such as sex, age, medical school admission pathway, nationality, year of medical education and choice of career specialty. Choice of specialty was categorised according to person-oriented specialties (related to general practice, internal medicine, paediatrics, psychiatry and obstetrics and gynaecology) and technique-oriented specialties (related to the surgical area and specialties such as ophthalmology, otorhinolaryngology, anaesthesia, radiology and pathology).[40]

Procedure

The questionnaire and VPT task links were distributed via email to medical students from January to May during the academic years 2017–2018 and 2018–2019. Briefly, all eligible students were invited to participate in a study which aimed to investigate the factors which impact on interpersonal understanding among medical students in clinical years. They were told that each of the online questionnaire and visual task elements would take approximately 10–15 min to complete. Participation was voluntary and not linked with course credits. The JSPE, EQ and sociodemographic questions were hosted online on the Typeform survey platform (https://www.typeform.com/). A link at the end of the questionnaire directed participants to the VPT task, hosted on the Testable (https://www.testable.org) behavioural testing platform. Participant anonymity was maintained throughout and the researchers blinded by using the web-based platform for collection and collation of data. A welcome web-page stated the participant's rights, general information about the study and that by pressing the button to continue the participant gives her/his consent for the study.

Data analysis

Summary statistical analysis was completed for categorical and non-categorical variables. Consistent with previous VPT studies,[27 36] only matching trials (ie, 'yes' response trials) were analysed and RT was analysed only on correct response trials. Medians were used instead of means to estimate VPT performance because all participants produced outlying RT (15% of trials on average), which excessively influences the mean but not the median.[41] Given the limited statistical power of each university sample separately, we analysed performance only on the full sample. Fourteen participants with outlying accuracy (ie, rate of correct responses at chance level, determined as within the 95% CI around chance level: ≤0.625) in

Table 1 Characteristics of the study population (n=180)

Characteristic	N	%
Sex		
Female	121	(67.2%)
Male	59	(32.8%)
Age (years)		
Mean age (SD)	24.3	(3.0)
Range	21–42	
Nationality		
Belgium	79	(43.9%)
Ireland	41	(22.8%)
Other European	16	(8.9%)
South East Asian	21	(11.7%)
Canadian	12	(6.7%)
Other	9	(5.0%)
Country		
Irish	68	(40.7%)
Belgian	99	(59.3%)
Preferred career specialty		
Person-oriented	138	(76.7%)
Technique-oriented	41	(22.8%)

Figures presented are number (%) unless stated otherwise.

baseline trials (ie, in congruent perspectives trials where no interference between perspectives could cause erroneous responses) were excluded from analyses. Consequently, 180 participants were included in these analyses and it changed the average rate of correct responses from M=0.937 (SD=0.132) to M=0.970 (SD=0.054). Analysis of variance (ANOVA) with 'perspective' (self-perspective vs avatar's perspective) and 'congruency' (congruent vs incongruent perspectives) as within-subject independent variables was conducted on correct RT and accuracy rates.

Correlational analysis using Pearson's correlation co-efficient (r) was used to establish associations between VPT measures and total and subscale scores for the JSPE and EQ. Multiple linear regression analyses were conducted to identify significant predictors of selected VPT performance measure variation. For all analyses, a p value <0.05 was considered statistically significant. All statistical analyses were completed using SPSS V.20 (IBM, New York, New York, USA).

RESULTS
Study demographics
One hundred eighty participant responses were included in the present sample. Age of participants ranged from 21 to 42 years (M=24.3, SD=3.0), and 67.2% (n=121) of the sample was female participants. Table 1 provides a summary of the demographic and educational characteristics of the study sample.

VPT performance
Reaction times
The ANOVA revealed a non-significant main effect of 'perspective' ($F_{(1,179)}=0.712$, p=0.400, $\eta_p^2=0.004$), indicating an absence of performance advantage at judging from one perspective over another, and a significant main effect of 'congruency' ($F_{(1,179)}=139.223$, p<0.001, $\eta_p^2=0.438$), signifying slower RT for incongruent perspectives trials, and a significant interaction between 'perspective' and 'congruency' ($F_{(1,166)}=27.604$, p<0.001, $\eta_p^2=0.134$). The interaction was further analysed via pairwise t-test comparisons.

Longer RTs for incongruent other trials than congruent other trials (t(179)=14.008, p<0.001) indicated the presence of an egocentric bias whereas longer RTs for incongruent self trials than congruent self trials (t(179)=5.382, p<0.001) indicated the presence of an altercentric bias. Furthermore, shorter RTs for congruent other than congruent self (t(179)=5.169, p<0.001) indicated the presence of an other-perspective advantage on congruent perspectives whereas longer RTs for incongruent other than incongruent self (t(179)=2.355, p=0.020) indicated the presence of a self-perspective advantage on incongruent perspectives. At last, the egocentric bias (M=99.614, SD=95.407) is significantly higher than the altercentric bias (M=47.125, SD=117.471; t(179)= 5.254, p<0.001).

Accuracy rates
The same ANOVA was then conducted on accuracy rates, which revealed a non-significant main effect of 'perspective' ($F_{(1,79)}=3.226$, p=0.074, $\eta_p^2=0.018$), a significant main effect of 'congruency' ($F_{(1,179)}=54.844$, p<0.001, $\eta_p^2=0.235$), indicating a lower accuracy for incongruent perspectives trials, and a non-significant interaction between 'perspective' and 'congruency' ($F_{(1,179)}=0.200$, p=0.655, $\eta_p^2=0.001$).

These RT and accuracy results replicate previous VPT studies,[27 36–38 42] providing confirmation that VPT performance was accurately assessed.

Correlations between VPT performance and scores for the EQ and JSPE
Pearson's correlations were computed between the four VPT indices (accuracy, RT) and the total and subscales scores of the EQ and JSPE; results are displayed in table 2.

Results indicate that higher egocentric bias, based on RT scores, are associated with lower values on the 'social skills' subscale of the EQ. Additionally, a greater score on the JSPE 'standing in the patient's shoes' subscale was significantly correlated with lower accuracy across three of the VPT indices (congruency, egocentric bias, altercentric bias), and a marginally significant negative correlation was observed between total JSPE and egocentric bias (p=0.051). To determine the extent to which JSPE empathy measure subscales influence these VPT indices, multiple linear regression analysis was conducted. For the accuracy of the congruency effect, a significant regression

Table 2 Correlations between the indices of visual perspective-taking (VPT) performance and the scores on the Empathy Quotient (EQ) and the Jefferson Scale of Physician Empathy (JSPE)

VPT indices		EQ				JSPE			
		Total	Cognitive empathy	Emotional empathy	Social skills	Total	Perspective taking	Compassionate care	Standing in patient's shoes
Congruency effect	RT	−0.008	0.016	0.074	−0.101	−0.072	−0.011	−0.10	−0.131
	Accuracy	−0.055	−0.053	−0.096	0.02	−0.10	−0.023	−0.088	−0.196**
Egocentric bias	RT	−0.086	0.006	0.005	−0.176*	−0.038	0.008	−0.042	−0.129
	Accuracy	−0.072	−0.050	−0.138	0.034	−0.146	−0.093	−0.113	−0.150*
Altercentric bias	RT	−0.054	−0.093	0.023	−0.023	−0.045	−0.032	−0.048	−0.035
	Accuracy	−0.024	−0.039	−0.031	0.003	−0.031	0.043	−0.040	−0.174*
Self-perspective advantage	RT	−0.070	−0.071	−0.056	0.028	0.03	−0.003	0.067	0.050
	Accuracy	−0.040	−0.126	0.022	−0.057	−0.081	−0.118	−0.024	0.022

*p<0.05; **p<0.01. Study participants were 180 medical students.
RT, reaction time.

equation was found ($F_{(3,176)}=2.73$, p=0.046), with an R^2 of 0.044. 'Standing in the patient's shoes' was the only predictor of reduced congruency effect accuracy score (B=−0.007, 95% CI=−0.013to 0.002, p<0.05). Regression models examining the predictive effects of JSPE subscales on accuracy-based scores for egocentric bias and altercentric bias did not achieve statistical significance. Multiple linear regression analysis examined the impact of EQ subscales on RT-based egocentric bias variation; a marginally significant regression equation was found ($F_{(3,176)}=2.751$, p=0.08), with an R^2 of 0.038, where higher scores on the 'social skills' subscale was significantly associated with reduced egocentric bias (B=−10.17, 95% CI=−17.98 to 2.36, p<0.05).

Influence of demographic and educational characteristics

For accuracy-based VPT measures, Irish medical students demonstrated higher congruency ($t(178)=3.71$, p<0.001), egocentric bias ($t(178)=2.51$, p=0.013) and altercentric bias ($t(178)=3.51$, p<0.001) relative to Belgian students. No differences were observed across the four RT-based VPT measures (all p>0.05). However, Irish students demonstrated higher values on the EQ 'social skills' subscale ($t(178)=3.49$, p=0.001), and a difference in the opposite direction was observed for the JSPE 'standing in patient's shoes' subscale ($t(178)=4.48$, p<0.001). Similarly, no association was found between age and any of the four VPT measures or empathy scale scores (all p>0.05). Although VPT performance was not influenced by sex (all p>0.05), female participants showed higher scores for the total EQ ($t(178)=2.36$, p=0.019) and 'emotional empathy' EQ subscale ($t(178)=4.20$, p<0.001), as well as the JSPE total ($t(178)=2.99$, p=0.003), JSPE 'perspective taking' ($t(178)=2.05$, p=0.042), JSPE 'compassionate care' ($t(178)=2.58$, p=0.011) and JSPE 'standing in patient's shoes' ($t(178)=2.51$, p=0.013) subscales. Career specialty preference was associated with the 'self-perspective advantage' RT VPT measure; students selecting the 'technique-oriented' specialty category showing higher values for this indice relative to 'person-oriented' students (U=2062, z=2.63, p=0.008; figure 2). 'Person-oriented' specialty
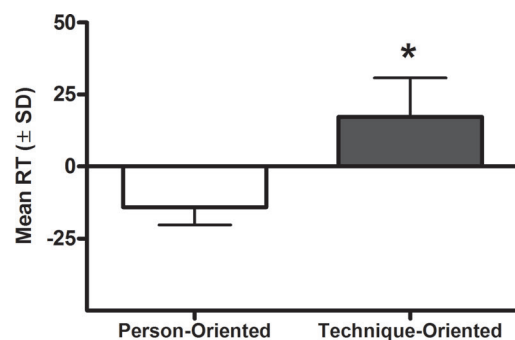
Figure 2 Mean (±SD) reaction time (RT) for visuospatial perspective-taking measure 'self-perspective advantage' across the two career preference categories (person-oriented, technique-oriented). *p<0.05 vs 'person-oriented' category respondents.

preference was associated with higher scores across the following JSPE scale measures (online supplemental figure 1): total score (U=2074.50, z=2.59, p=0.01); 'compassionate care' subscale (U=1883.00, z=3.25, p=0.001). 'Person-oriented' specialty students also showed higher scores for the 'emotional empathy' EQ subscale relative to 'technique-oriented' students (U=1958.00, z=3.00, p=0.003).

DISCUSSION

This study aimed to measure and compare for the first time performance-based measures of cognitive empathic processes in a medical student sample, alongside widely used empathy self-report scales. Results revealed a series of meaningful associations and differences expressed on specific subscales and subcomponents.

The first finding relates to the egocentric bias, capturing the capacity of the medical student to adequately adopt the other person's point of view when her/his own point of view may differ from those of the other person. Lower egocentric bias was significantly associated with higher scores on the 'social skills' subscale of the EQ. As described by Lawrence et al,[31] the 'social skills' subscale assesses the presence (or absence) of intuitive social skills and spontaneous and context-independent use of social skills. It has been noted that such skills are dependent on a certain amount of cognitive empathy.[31] Consistent with this observation, 'social skills' subscale scores in the current study were significantly correlated with the EQ 'cognitive empathy' subscale (r=0.35, p<0.001). Inspection of two items used to score the 'social skills' subscale ("In a conversation, I tend to focus on my own thoughts rather than on what my listener might be thinking" and "I find it difficult to explain to others things that I understand easily, when they don't understand it first time") reveals an obvious overlap between the constructs of egocentric bias and this EQ subscale.

In line with our hypotheses, three indices of VPT performance (congruency, egocentric bias, altercentric bias) were significantly correlated with one of the self-report cognitive empathy measures, the 'standing in patient's shoes' subscale of the JSPE. Inspection of the two items used to score this subscale ('It is difficult for a doctor to view things from patients' perspectives' and 'Because people are different, it is difficult to see things from patients' perspectives') reveals an obvious similarity between the constructs of VPT-based perspective taking and this JSPE subscale. Importantly, the congruency index is the combination of the egocentric bias (ie, the interference caused by irrelevant self-related information) and the altercentric bias (ie, the interference caused by irrelevant other-related information); the fact that the three indexes are reduced in relation to higher scores in 'standing in patient's shoes' is informative about what specific cognitive empathic process is related to self-reported empathy in medical students. Specifically, it is the capacity to detect and resolve the interference

caused by the incongruent irrelevant perspective, that is, self-other distinction, a uniquely human and cognitively complex capacity of empathy.[43] In summary, those medical students who self-reported higher scores on the 'standing in patient's shoes' subscale performed better at teasing apart their own perspective from another person's perspective.

No relationship was observed between the JSPE subscale 'perspective taking' and any of the VPT measures, further informing the debate whether the JSPE subscale 'perspective taking' is adequate to capture cognitive empathic skills.[24] Indeed, comparisons of the 'perspective taking' and the 'standing in patient's shoes' JSPE subscales reveal differences in that the latter directly asks about the physicians' relational difficulties, whereas the 'perspective taking' subscale asks about adherence to a set of principles and values (eg, 'A physician who is able to view things from another person's perspective can render better care' and 'Empathy is an important therapeutic factor in medical treatment'). Hence, the absence of any relationship between the 'perspective taking' JSPE subscale and conceptually related performance measure might reflect the observation that the former neither captures actual performance nor does it include items directly asking about performance. These interpretations are however based on correlational results, which can be spurious or confounded by non-measured variables (eg, IQ, attentional skills), and thus remain speculative without further empirical support.

Previous studies using self-report empathy scores have shown an unclear association with laboratory-based measures of empathic behaviour. In a comparative longitudinal study by Smith et al,[11] medical students completed self-report (including the JSPE) and behavioural (including the reading the mind in the eyes test (RMET)) measures twice a year during the first 3 years of their studies. They demonstrated that while JSPE scores declined over this period, the opposite pattern was observed for RMET performance, highlighting once more the complex relationship between alternative measures of empathy. As mentioned in the 'Introduction' section, a large part of this heterogeneity in research findings results from: (1) failure to deconstruct empathy in terms of more clearly defined components of empathy; (2) over-reliance on self-report measures; (3) a lack of critical examination regarding how a specific component is measured (eg, motivation vs actual competency). Future studies on cognitive empathic abilities of medical students should carefully select the self-report scales so that items directly assess specific cognitive empathy components, such as in terms of motivational states (caring about others) or performance.

Higher accuracy scores for VPT measures were associated with higher scores on the 'standing in patient's shoes' JSPE subscale. It has been noted that self-report empathy measures are susceptible to social desirability bias, which can yield spurious findings.[44] Social desirability has been conceptualised to include self-deceptive enhancement (ie, an exaggeration of one's positive traits and the denial of

negative traits) and impression management (ie, deliberate attempts to present oneself positively[45]). Narcissism is a personality trait which may be related to positivity biases, resulting in overall more positive ratings on self-report measures of empathy.[46] It has been suggested that narcissistic personality may represent a trait which is likely to reduce perspective-taking motivation.[47] Future studies may wish to examine the extent to which personality traits and states may mediate the relationship between self-report and performance-based measures of empathic processes (eg, see Bukowski and Samson[42] for the interplay between perspective taking, automatic imitation and narcissism).

In the current study, students selecting the less people-orientated 'technique-oriented' clinical specialty preference showed an increased self-perspective advantage in the VPT relative to those selecting 'person-oriented' specialties, indicative of greater attentional priority given to the self-perspective in these students. In a complementary manner, 'people-oriented' respondents demonstrated higher total JSPE scores and greater scores on the JSPE 'compassionate care' subscales. These data are consistent with previous results showing higher JSPE scores in medical students who indicate a high preference for person-oriented specialties score higher on the JSPE.[18] This likely reflects a preference for specific specialties which match students' own cognitive empathy attributes.[48]

It may be argued that the size of the correlation coefficients reported in this study are insubstantial, as they explained from 2.3% to 3.8% of the variance in VPT performance (r=0.150–0.196). However, a recent meta-analysis of 85 studies showed that correlations between self-report and performance-based measures of empathy explain on average only 1% of the variance.[49] Additionally, a recent six-experiment study (involving 1347 participants) reported a stable correlation coefficient of 0.20.[50] Furthermore, inspection of the only five studies that examined correlations between self-reported empathy and clinical empathic performance among medicine students reported either non-significant correlations,[51] a single significant correlation,[52–54] with coefficients ranging from 0.19 to 0.247, or several correlations in the range similar to the present study.[55]

Additional study limitations may include questions related to the face validity of the VPT in a healthcare context. The task does not focus on doctor-patient interactions, merely the perspectives of a non-specific avatar. However, it is expected that the cognitive processes under study are pertinent irrespective of the target and VPT measures do correlate well with self-reported empathic tendencies in other groups.[30 37] Lastly, a remote testing platform such as Testable to measure VPT performance enables easier recruitment of medical students in their clinical years, a group who are often difficult to access due to their clinical workload. However, it does introduce a degree of interindividual variability due to differences in the test setting.

In a health professions education research context, we have introduced a finer grained measure of perspective taking, the VPT task, that can be further deconstructed into multiple indices of performance that is differently related to motivational and skill aspects of cognitive empathy. Examining correlations between the VPT indices and the specific subscales of self-report empathy measures in this study have allowed us to generate new critical hypotheses about the reasons underlying discrepant findings concerning the relationship between self-report and observed empathic ability of medical students and physicians.

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