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Personality and values as predictors of medical specialty choice

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ABSTRACT

Research rarely considers the combined influence of personality traits and values in predicting behavioral outcomes. We aimed to advance a germinal line of inquiry that addresses this gap by separately and simultaneously examining personality traits and physician work values to predict medical specialty choice. First-year medical students (125 women and 119 men) responded to measures of personality and physician work values. After graduation, participants' residency choices were identified. Results indicated that personality traits predict person- or technique-oriented medical specialty choice. Physician work values, whether used alone or in tandem with personality traits, however, did not significantly predict specialty choice. Implications for practice and research are discussed.

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Work values have long been considered as a trait variable suitable for matching people to jobs in individual difference tradition (Lofquist & Dawis, 1978; Holland, 1997; Rounds, 1990; Super, 1970). As such, theorists and researchers have advanced work values, much like personality traits, as useful for predicting and promoting a range of behavioral outcomes. Such outcomes include occupational choice, work adjustment, and job satisfaction (Dawis, 1991, 2001; Holland, 1997; Super, 1995; Zytowski, 1994). Both work values and personality traits are widely thought to affect work motivation (Dawis, 2001; Furnham, Forder, & Ferrari, 1999) and research generally supports links between personality and vocational choice (Phillips & Jome, 2005).

The utility of values alone as an individual difference variable for predicting vocational choice, while receiving some support (e.g., Judge & Bretz, 1992), has not, however, been as well studied and consequently not as well supported by the literature (Dawis, 2001; Hirschi, 2008). Some research suggests that examining the combined influence of values and other variables, such as personality and vocational interests, may be a more useful approach to using values for predicting behavioral outcomes like vocational choice (Duffy, Borges, & Hartung, 2009; Hirschi, 2008; Parks & Guay, 2009; Rounds, 1990). The present study aimed to further test this possibility by examining the combined influence of personality traits and values in predicting medical specialty choice.

Distinct lines of inquiry have investigated the particular and separate influences of values and personality on human behavior. Seldom have researchers examined the potential joint influences of these variables on behavioral outcomes. To address this problem, Parks and Guay (2009) developed a model that simultaneously considers values and personality in motivational processes related, respectively, to goal content such as achieving good grades and goal striving such as persisting in a behavior despite obstacles. Within this framework, personality traits reflect what people tend to do naturally and values reflect what people believe they ought to do. When combined, personality traits and values may increase predictability of behavioral outcomes because they represent distinct yet complementary variables (Parks, 2007).

Recent work in vocational psychology (Berings, De Fruyt & Bouwen, 2004; Hirschi, 2008; Duffy et al., 2009) has begun to examine personality and values, both in tandem and along with other constructs. This work aims to gain a more complete and holistic understanding of how these variables influence vocational behavior. Notably, Hirschi (2008) examined personality

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complexes comprising traits, vocational interests, work values, and self-evaluations. Results of his study supported using these variables in combination to better comprehend career choice and development. Similarly, Berings et al. (2004) found that a majority of work values relate moderately to personality traits. We aimed to further test relationships between personality traits and work values by examining their potential joint influence in predicting career specialty choice among medical students.

Previous research has established that significant differences in personality traits and values exist among physicians with regard to their medical specialty (e.g., Borges & Gibson, 2005; Borges & Osmon, 2001; Hojat et al., 1998; Smith et al., 2007; Wasserman, Yufit, & Pollack, 1969; Xu et al., 1996–1997). Differences in personality traits and values have also been observed in relation to medical students' self-reported specialty preferences (Hojat & Zuckerman, 2008; Leong, Hardin, & Gaylor, 2005; McFarland & Rhoades, 1998; Rogers & Searle, 2009). However, these studies have investigated personality traits and values with cross-sectional research designs and have examined personality traits and values separately. The complementary nature of personality traits and values (Parks, 2007; Parks & Guay, 2009) may in fact prove to be particularly useful in predicting differences related to specialty choice.

Using a longitudinal design, the present study investigated separately and conjointly the variables of personality traits and physician work values as predictors of medical specialty choice within a sample of first-year medical students. Previous research has demonstrated that personality and value differences exist among practicing physicians in relation to chosen specialty and among medical students in relation to specialty preference. We hypothesized that personality traits and values will separately predict specialty choice. Additionally, we hypothesized that using personality traits and values in tandem will increase the accuracy in predicting medical specialty choice.

Method

Participants

Participants comprised 244 first-year medical students (125 women and 119 men) enrolled in a combined six-year B.S./M.D. (n = 180) or 4-year M.D. (n = 64) program at a Midwestern medical school. Students in the six-year B.S./M.D. program typically have an average age of 20 years upon entering the M.D. portion of the program and elect to enter the profession of medicine directly from high school. They complete two years of undergraduate course work and then enter medical school in their third year. Some students enter the M.D. program directly after completing a traditional four-year degree. These direct-entry students typically have an average age of 22 years. A one-way analysis of variance (ANOVA) was conducted to determine whether or not B. S./M.D. and four-year direct-entry M.D. students differed with regard to the 22 variables (6 physician work values and 16 personality traits) used in the study. Bonferroni adjustment to the alpha level was made as control for multiple comparisons (.05/22 = p < .002). Results indicated no significant differences between the two groups on the variables. From the total of 338 students invited to participate in the study, 31 students did not consent to do so. An additional ten students partially completed either one or both measures. Medical specialty choice was not available for 53 students, possibly due to student attrition during medical school or to a student being off cycle in terms of graduating as originally scheduled. Two-hundred-forty-four students completed all measures and later graduated from medical school and entered post-graduate medical training as residents between 2006 and 2008 yielding a 72% response rate.

Measures

Physician work values

The 38-item version of the *Physician Values in Practice Scale* (PVIPS; Hartung, Taber, & Richard, 2005) was used to measure work values in the context of medical practice. Each item is preceded by the stem "In my medical practice it will be important that I..." followed by a statement such as "be recognized as the best physician in my group." Respondents indicate their level of agreement with each statement using a Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree. Responses are summed to yield measures of six core values found to be common among multiple and large samples of medical students: Prestige (obtaining recognition and rewards), Service (caring for others), Autonomy (independence and self-direction), Lifestyle (predictable and controllable work schedule, work–nonwork balance), Management (supervise others), and Scholarly pursuits (involvement in scholarly activities). Hartung et al. (2005) reported Cronbach's alpha internal consistency reliability estimates ranging from .77 for lifestyle to .88 for prestige. The PVIPS has demonstrated good content and construct validity evidence (Hartung et al., 2005; Hartung, 2010).

Personality

The 16 Personality Factor Questionnaire Fifth Edition (16 PF; Cattell, Cattell, & Cattell, 1993) was used to measure personality traits. The 16 PF is a 185-item norm-referenced test of 16 bipolar personality traits including Warmth, Reasoning, Emotional Stability, Dominance, Liveliness, Rule-consciousness, Social Boldness, Sensitivity, Vigilance, Abstractedness, Privateness, Apprehension, Openness to Change, Self-reliance, Perfectionism, and Tension. The 16 PF uses a three-point multiple-choice response format with the middle response being a question mark representing an "in between" response or uncertainty in responding to the question. Estimates of internal consistency reliability (Cronbach's alpha) range from .68 for Dominance to .87 for Social Boldness (Conn & Rieke, 1994). Because the scales of the 16 PF are factor-analytically derived, it demonstrates good

construct validity evidence and a substantial amount of research has demonstrated criterion-related validity evidence for the measure (Conn & Rieke, 1994).

Procedure

With institutional review board approval, first-year medical school students for the period from 2002 to 2004 responded to the PVIPS and the 16 PF during their first semester. Measures were administered in a large-group setting. Upon their subsequent graduation from medical school, their actual specialty choices were obtained from the National Resident Matching Program (NRMP) data. The NRMP is a private, not-for-profit corporation established in 1952 to provide a uniform date of appointment to positions in graduate medical education in the United States. Students were then grouped by person-oriented or technique-oriented specialties using the classification for specialties used by Yufit, Pollock, and Wasserman (1969). This classification scheme describes person-oriented specialties as specialties with an inclination towards people and the entire patient. Technique-oriented specialties involve a focus on technical skills, instruments, and techniques related to patient care. Using this classification scheme, students entering the specialties of family practice, internal medicine, obstetrics and gynecology, pediatrics, physical medicine and rehabilitation, and psychiatry were classified as person-oriented. Students entering anesthesiology, dermatology, emergency medicine, otolaryngology, pathology, radiology, or surgery were classified as technique-oriented. In the current study, 124 (51%) participants entered person-oriented medical specialties and 120 (49%) entered technique-oriented specialties.

Results

Means, standard deviations, and zero-order correlations for the personality traits and physician work values appear in Table 1. Significant correlations were observed between seven of the personality traits and four of the physician work values. However, the significant correlations were small, ranging from r=.13 between Vigilance and Prestige to r=.21 between Dominance and Management. The pattern of results suggested little relationship between personality traits and physician work values in first-year medical students.

Discriminant analysis

Three separate discriminant analyses were performed to assess physician work values and personality traits that best differentiated person- versus technique-oriented specialty choices. In the first analysis, personality traits were entered to examine whether they differentiated person- versus technique-oriented specialty choices. In the second analysis, physician work values were entered to examine whether they differentiated person- versus technique-oriented specialty choices. In the second analysis, physician work values were entered to examine if there is an incremental validity in differentiating person-versus technique-oriented specialty choices. For each discriminant analysis, Box's M statistic was used to assess equality of the variance–covariance matrices between the two groups. In order to assess the stability of the results from each analysis, cross-validation with a jackknifed classification procedure was conducted. This procedure performs as many discriminant analyses as there are participants involved in the analyses leaving one participant out each time to simulate using the variables with new samples (Tabachnick & Fidell, 2007).

Personality

To examine whether personality traits assessed at the beginning of medical school later predict specialty choice, all 16 traits measured by the 16 PF were entered in the discriminant analysis. A single discriminant function separated person- vs. technique-oriented specialty choices among first-year medical students (*Wilk's* Λ =.78, χ^2 =57.72, df=16, p<.001). Thus, 22% of the variance separating person- from technique-oriented specialty choices is attributed to personality traits. For this sample, discriminant analysis identified seven personality traits with structure matrix correlations equaling .33 or greater (Tabachnick & Fidell, 2007) and that maximized separation between the two groups: Sensitivity, Dominance, Warmth, Rule-consciousness, Tension, Vigilance, and Apprehension. Table 2 presents structure matrix coefficients and correlations.

Results indicated that first-year medical students who entered person-oriented specialties tend to be more sensitive (M = 5.60, SD = 2.01) than those who entered technique-oriented specialties (M = 4.46, SD = 1.90). Medical students who entered person-oriented specialties also tended to display more warmth (M = 5.93, SD = 1.78) than those entering technique-oriented specialties (M = 5.18, SD = 1.82). Additionally, those who elected to enter person-oriented specialties tended to be more rule conscious (M = 5.61, SD = 2.01) and apprehensive (M = 6.19, SD = 1.81) compared to those who entered technique-oriented specialties (M = 4.46, SD = 1.90) and M = 5.56, SD = 1.84, respectively). Conversely, first-year medical students electing to enter technique-oriented specialties tended to be more dominant (M = 5.70, SD = 1.89), vigilant (M = 6.55, SD = 1.87) and tense (M = 5.56, SD = 1.67) compared to those who entered person-oriented specialties (M = 4.77, SD = 1.88, M = 5.90, SD = 1.76), and M = 4.93, SD = 1.55, respectively). As seen in Table 3, these seven personality traits accurately classified 70% of specialty choices. Seventy-two percent of medical students who entered person-oriented residencies were correctly classified and 68% of those who entered technique-oriented specialties were correctly classified. Cross-validation of these results was obtained using jackknifed classification procedures and demonstrated a slight decrease to 66% accuracy in overall classification.

	М	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. Warmth	5.56	1.84	-																					
2. Reasoning	7.57	1.53	10	-																				
3. Emotional	5.78	1.75	.12	.06	-																			
Stability																								
4. Dominance	5.23	1.94	.07	02	.11	-																		
5. Liveliness	6.27	1.62	.35**	05	.24**	.20**	-																	
6. Rule	5.27	1.69	.15*	03	.08	15*	23 ^{**}	-																
Consciousness																								
7. Social	5.80	1.88	.39**	10	.25 **	.42 **	.44 **	01	-															
Boldness																								
8. Sensitivity	5.04	2.04	.36**	.02	19**	13*	02	03	01	-														
9. Vigilance	6.22	1.84	20 **	01	32	.07	.00	28	08	.02	-													
10. Abstractedness	5.66	1.86	14	.10	24	.09	.05	27 **	04	.11	.28	-												
Privateness	5.14	1.89	49**	10	22 **	20 **	26 **	04	43**	08	.30**	.12	-											
12. Apprehension	5.88	1.85	.22 **	03	40 **	12	.01	.22 **	09	.21	.05	.05	03	-										
13. Openness to	6.03	1.87	.08	.14*	.07	.18 **	.01	20 ^{**}	.04	.21 **	· .08	.39 **	.04	01	-									
Change			ىلە بلە		ماد باد		يك يك	<u>ب</u> د	يله عله		ماد ماد.	ale ale	ىدىك ،	k										
14. Self-reliance	5.24	1.65	47**	.08	31**	04	48	15	27**	.00	.30 **	.22	.28	07	.02	-								
15. Perfectionism	5.40	1.97	.12	11	.12	.05	06	.36	.10	04	10	33 **	09	- 16	14	06	-							
16. Tension	5.24	1.64	18***	13	31**	.27 籠	02	18	03	.04	.34 🔭	.03	.17 ***	.12	13	.22	02	-						
17. Prestige	30.83	7.54	10	.10	.00	.17**	.16*	17	.08	.01	.13 *	03	02	12	12	01	.10	30.	3 – "					
18. Service	31.56	6.99	.16	07	.11	.02	.11	.15	.17	.09	14	05	11	.12	.10	09	.20	07	7.15	-	<i>ب</i>			
19. Autonomy	24.30	4.84	.05	06	.09	.07	.09	07	.09	.07	04	03	01	.04	02	09	.11	.01	l .49 🗍	ູ້.59 ົ	۰ - ^۱	ч.		
20. Lifestyle	13.07	3.37	.10	07	03	.05	03	.06	.11	.06	05	05	10	.05	18	09	.10	02	2.36	Ĵ.20	.45	* - *		
21. Management	14.37	3.93	.00	.05	.02	.21	.13	01	.20	02	.06	07	11	09	12	08	.19	.04	1.57	.16	.20	.10 ^{°°}	. – .	*
22. Scholarly	8.36	2.77	10	.06	.01	.13 *	03	.06	01	05	.07	.12	.04	12	.12	.10	.08	06	5 .03	.05	14*	14*	.23	-
Pursuits																								

Table 1 Means, standard deviations, and correlations for scores on the 16 PF and PVIPS.

* p<.05. ** p<.01.

Table 2

Standardized discriminant function coefficients, and correlations for the person vs. technique-oriented specialties based on the personality trait predictors.

	Coefficient	Γ _s
Warmth	.28	.40
Reasoning	19	08
Emotional Stability	.13	01
Dominance	37	47
Liveliness	32	26
Rule Consciousness	.21	.39
Social Boldness	14	19
Sensitivity	.44	.56
Vigilance	22	34
Abstractedness	.06	05
Privateness	09	12
Apprehension	.22	.33
Openness to Change	.22	.16
Self-Reliance	.03	09
Perfectionism	.04	.14
Tension	20	37

Values

To examine whether physician work values assessed at the beginning of medical school later predict specialty choice, all six values measured by the PVIPS were entered in the discriminant analysis. Results indicated that physician work values did not significantly differentiate first-year medical students according to whether they entered person- or technique-oriented specialties (*Wilk's* Λ =.98, χ^2 =6.15, df=6, p=.41).

Personality and values

We next examined whether the linear combination of personality traits combined with the six physician work values would increase the accuracy in predicting person- vs. technique-oriented specialty choice. A single discriminant function separated person- vs. technique-oriented specialty choices among first-year medical students (*Wilk's* Λ = .77, χ^2 = 61.96, *df* = 22, *p*<.001). Table 4 presents structure matrix coefficients and correlations. Results largely mirror those found in the first two analyses. Of the seven personality traits identified in the first analysis that differentiated those who entered person-oriented or technique-oriented specialties, only Sensitivity, Dominance, Warmth, Rule-consciousness, and Tension maximally separated the two groups. Both Vigilance and Apprehension fell below the .33 threshold when combined with physician work values. Physician work values did not differentiate those who entered person-oriented or technique-oriented specialties. As seen in Table 5, five personality traits accurately classified 68% of specialty choices. Sixty-eight percent of those who entered person-oriented specialties were correctly classified and 69% of those who entered technique-oriented specialties were correctly classified. Cross-validation of these results was obtained using jackknifed classification procedures demonstrating a decrease to 62% accuracy in overall classification.

Discussion

The present study examined whether or not combining physician work values with personality traits would add to the predictive validity in differentiating first-year medical students who enter person- or technique-oriented specialties. We hypothesized that personality traits and values when used separately would predict medical specialty choice and that when used in tandem would increase predictive accuracy. The results of the study only found partial support for our hypotheses. Only personality traits demonstrated any predictive utility in differentiating those that entered person- or technique-oriented specializations. Specifically, our findings indicate that the personality traits of Sensitivity, Dominance, Warmth, Rule-consciousness, Tension, Vigilance, and Apprehension differentiate those who enter person- or technique-oriented specialties. Physician work values do not make such differential predictions when used alone. Further, combining physician work values with personality traits slightly decreases the predictive efficiency of personality traits alone in differentiating person- vs. technique-oriented specialty choices

Table 3

Classification of person-oriented vs. technique-oriented resident specialty choice based on personality traits.

Actual group	Number	Predicted group								
	of cases	Person		Technique						
		n	%	n	%					
Person	124	89	72	35	28					
Technique	120	39	33	81	68					

Note. Total proportion of cases correctly classified: 70%.

Table 4

Standardized discriminant function coefficients, and correlations for the person vs. technique-oriented specialties based on the personality traits and physician work values predictors.

	Coefficient	r _s
Personality traits		
Warmth	29	38
Reasoning	.20	.08
Emotional Stability	11	.01
Dominance	.36	.45
Liveliness	.33	.25
Rule Consciousness	27	38
Social Boldness	.11	.18
Sensitivity	44	53
Vigilance	.22	.32
Abstractedness	08	.05
Privateness	.11	.12
Apprehension	22	31
Openness to Change	22	15
Self-Reliance	04	.09
Perfectionism	05	13
Tension	.21	.35
Physician work values		
Prestige	.01	.21
Service	.21	07
Autonomy	26	02
Lifestyle	.30	.11
Management	11	.11
Scholarly Pursuits	.09	.10

among first-year medical students. Therefore, the assessment of physician work values early in medical education does not appear to have any predictive utility in specialty choice at the time of residency selection.

The results of the present study support findings from previous research that personality differences exert some influence on medical specialty choice (Borges & Savickas, 2002). The present findings indicate that first-year medical students who tend to be more attentive to others, tender minded, worrisome, and conscientious are more likely to enter person-oriented specialties. Conversely, our findings indicate that first-year medical students who tend to be more skeptical, socially dominant, and impatient are more likely to enter technique-oriented specialties.

Physician work values on the other hand did not demonstrate such predictive utility when used alone or in tandem with personality traits. This result contradicts a cross-sectional study that examined physician work values in relation to specialty preference. In a sample of Australian first and final-year medical students, Rogers and Searle (2009) reported that physician work values as measured by the PVIPS predicted choice for primary care and non-primary care specialties. Results indicated that medical students who had a preference for non-primary care specialties placed a higher value on prestige and scholarly pursuits whereas those who preferred primary care specializations tended to value autonomy to a greater degree. However, given the cross-sectional nature of the study, a major limitation is that students indicated their specialty preference and not their actual choice as in the case of the current study.

A potential reason why physician work values did not differentially predict specialty choice may be attributed to the nature of the PVIPS and the participant pool in this study. The PVIPS was designed to assess work values in the context of medical practice (Hartung et al., 2005). The context-specific content of the PVIPS may not be suitable in assisting first-year medical students' discernment of physician work values since they have not yet been exposed to medical practice as part of their training. The assessment of such context-specific values may not lend itself to differential prediction of specialty choice until medical students have some direct contact with various specialties. Recent longitudinal research indicates that the clinical experiences gained during the clerkship phase of medical education significantly influence specialty preference (Maiorova, Stevens, Scherpbier, & van

Table 5

Classification of Person-oriented vs. technique-oriented resident specialty choice based on personality traits and physician work values.

Actual group	Number	Predicted group								
	of cases	Person		Technique						
		n	%	n	%					
Person Technique	124 120	84 37	68 31	40 83	32 69					

Note. Total proportion of cases correctly classified: 68%.

der Zee, 2008). It may not be until students have a sufficient frame of reference regarding medical practice that physician work values can be meaningfully assessed and thereby become useful in predicting specialty choice.

Alternatively, it may be the case that as guideposts of vocational behavior, values influence *how* an individual practices an occupational choice rather than predict *what* occupation an individual chooses. For example, one person makes the occupational choice of physician primarily to realize altruistic values, whereas another person does so primarily to realize lifestyle values. If so, values may be more useful for understanding how one practices within a given occupation rather than what occupation one selects.

Given the results of the current study, future longitudinal research investigating the combined predictive validity of personality traits and values in medical specialty choice may want to consider both the type of values measure used and the nature of the sample. Research involving medical students prior to clerkship experiences might do well to consider personal values assessment (e.g. Rokeach Value Survey; Rokeach, 1973) or generic work values assessment (e.g. The Values Scale; Nevill & Super, 1989) to investigate whether these more general values assessments add incremental validity in the prediction of specialty choice. Research involving medical students' clerkship experiences should consider using more context-specific values measures such as the PVIPS to examine whether a context-specific measure of values has greater utility once a student has acquired a frame of reference for medical practice.

Results of the current investigation also have implications for practice. Students struggling with specialty choice can benefit from career counseling interventions (Leong et al., 2005). Results from the current study indicate that personality traits differentiate first-year medical students entering person- or technique-oriented specialties. These personality differences can be observed early in medical education and therefore may be useful in facilitating early exploration of medical specialties. Specialty exploration with first-year medical students should initially focus on these trait differences in order to facilitate broad-based exploration of person or technique-oriented specialties. This initial guidance in specialty exploration can help medical students to systematically explore specialties that are complementary to their personality without having to consider the myriad possibilities for specialization. Using personality assessments may be particularly helpful with first-year medical students to identify a specialty preference at that point in their medical education (Borges, 2007).

Although the current study examined the separate and conjoint influence of personality traits and values to prospectively predict medical specialty choice, it did, of course, have some limitations. First, results are limited to first-year medical students and may not be generalizable to medical students at more advanced levels of their medical education. A different pattern of results may have emerged had we used samples of participants across the continuum of medical school training rather than just students in their first year. Additionally, data were collected from a single medical school. Therefore, results may not generalize to other types of medical school where different admission criteria and training experiences may affect residency choices.

Future research regarding personality traits and physician work values could examine how these domains contribute to predicting specialty choice and physician satisfaction and retention. First, future research should investigate the predictive utility of personality traits and physician work values combined with interest assessment contextualized for medical practice (Richard, 2005). As suggested previously, such research may yield significant results after medical students have completed their clerkships thereby giving them a frame of reference for medical practice. Additionally, future research examining the role of personality and physician work values in specialty choice should also consider whether individual differences in these domains relate to satisfaction with specialty choice. Physicians experiencing job dissatisfaction are likely to leave the field of medicine (Landon, Reschovsky, Pham & Blumenthal, 2006). Recent research suggests that job satisfaction for physicians may vary as a function of specialty area (Duffy & Richard, 2006). Research examining the role of personality and value incongruence with specialty choice may shed some additional light on the causes of job dissatisfaction among practicing physicians in similar fashion as interest incongruence has demonstrated (Borges, Gibson, & Karnani, 2005).

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