The Predictive Validity of the Medical Specialty Preference Inventory

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Abstract

This study examined the predictive validity of the Medical Specialty Preference Inventory (MSPI) 2nd edition. Data from 537 medical students who took the MSPI on the Careers in Medicine website during the third and fourth year of training were used in the analysis. The analysis determined the hit rate for an individual's predicted specialty when an MSPI score was greater than 72, the highest preference score for that student, greater than 72 and also the highest preference score for that student. Using the third criterion, the percentage of correct predictions for each of the big six specialties were as follows: Family Medicine (54%), Pediatrics (51%), Internal Medicine (79%), OBGYN (34%), Surgery (43%), and Psychiatry (71%). Overall, the MSPI correctly predicted an individual's medical specialty choice 51% of the time. This hit rate far exceeds that which one would expect to see by chance alone. Consequently, the researchers conclude the MSPI demonstrates strong predictive validity, and support the use of the instrument by career counselors advising medical students in making a specialty choice.

Introduction

A medical student's specialty choice constitutes an important personal decision with far reaching consequences for both the individual and community. Medical specialty counseling has developed over time to assist students in making such choices. Some Career advisors use the Medical Specialty Preference Inventory (Zimny & Senturia, 1976) to facilitate the decision-making process. In 2001 the MSPI was updated and made available to medical students through the internet. This revision brought about a number of important changes including, a reduction in the number of items, a change in the content of the items, and a more efficient method of administration. Although research demonstrated the strong predictive validity of the original version of the MSPI, the updates mentioned herein demand that new research be conducted to

examine the validity of the newest edition of the instrument. This study investigated the predictive validity of the MSPI 2nd edition.

Methodology

Instrument

The MSPI measures medical interests, and is used to assist students in choosing a medical specialty. First released in 1976, the inventory composed 199 items, which students responded to on a seven-point scale. Responses indicate a student's preference for each item, with greater numbers reflecting greater preference. A 2002 revision of the MSPI resulted in a reduction in the number of items to 150. Of the 150 items, 104 are used for scoring purposes. The remaining 46 are intended for use in constructing future scales. The MSPI 2nd edition was constructed such that it could be self-administered on the internet, and is available online through the Careers in Medicine Website. The instrument takes approximately ten minutes to complete.

The MSPI items reflect job specific tasks that relate directly to medical practice. Students rate each item on a seven-point scale reflecting an individual's degree of desirability for each item. A score of 1-2 indicates low desirability, 3-5 indicates moderate desirability, and 6-7 indicates high desirability. Differences between a student's factor scores and specialist determine his or her preference for each medical specialty. Students whose factor scores **are** similar to specialist scores for the same factors will receive a high preference score for that particular specialty. Scores are calculated for: Family Medicine (FAM), Obstetrics Gynecology (OBGYN), Surgery, Psychiatry (PSY), Pediatrics (PED), and Internal Medicine (MED). Higher scores indicate a greater preference for a specialty, while lower scores indicate less preference for a specialty. A score greater than 72 indicates a preference for a specialty, whereas a score less than

70 indicates less preference. Scores between, and including, 70 to 72, indicate moderate preference.

Data Collection

Data was collected for 537 medical students who took the MSPI on the Careers in Medicine website during the third and fourth year of training. This data was gathered from January 2005 to December 2006, and contained 190 male students, 316 female students, and 31 students who did not report their gender. The instrument was self-administered on the internet, and preference scores were reported to students immediately upon completion. To test the predictive validity of the MSPI, each student's preference scores were compared to his or her current specialty.

Data Analysis by Criteria

Three analyses, using different criteria, were conducted to determine the predictive validity of the MSPI. The first analysis took any preference score greater than 72 to be the predicted specialty for that particular student. This somewhat inflated the percentage of matches between high preference scores and a student's chosen resident training specialty because a student could have more than one score greater than 72. The second analysis used the highest MSPI score as a student's predicted specialty. The final analysis determined a student's predicted specialty to be that where the student's highest MSPI score was also greater than 72. Table 1 reports the hit rates for the three analyses.

The first analysis sought only those students who had an MSPI preference score greater than 72. The majority, 89% of the students, met this criteria. However, these results should be interpreted with caution as an individual may have had more than one preference score greater than 72. No steps were taken to isolate these students. As a result, it is possible, and most likely

probable, that this statistic of is somewhat inflated. Of the 478 medical preference scores that met the criteria for the first analysis, 210 matched a student's chosen specialty, yielding an overall hit rate of 39%. The individual hit rates for each specialty were as follows: Internal Medicine (53%), Psychiatry (69%), Family Medicine (43%), Pediatrics (42%), Surgery (39%), and OBGYN (29%). The specialty most likely to be predicted as a student's chosen medical specialty was Surgery, for which 25% of the scores were greater than 72.

The second analysis examined the predictive validity of preference scores based on a student's highest score, regardless of whether or not that score was greater than 72. This yielded an overall hit rate of 45%, with 239 matches out of a possible 537. The following individual hit rates were observed for each of the specialties: Internal Medicine (75%), Psychiatry (65%), Family Medicine (54%), Pediatrics (45%), Surgery (35%), and OBGYN (27%). The specialty most likely to be predicted as a student's chosen medical specialty was surgery, which was reported to be a student's highest preference score 36% of the time. As a result of using a student's highest score, this analysis had the advantage of including all 537 students.

The third analysis found 341 students whose highest preference score was also greater than 72. The predicted medical preference for 174 of these students matched their chosen specialty, resulting in a hit rate of 51%. The following hit rates were returned for each of the individual specialties: Internal Medicine (79%), Psychiatry (71%), Family Medicine (54%), Pediatrics (51%), Surgery (43%), and OBGYN (34%). Most individuals were predicted to enter Surgery, with 32% reporting preference scores that met the criteria for prediction. The criteria used in this analysis appeared to be the most accurate in predicting a student's medical specialty. However, only 341 of 537 students were found to have a preference score greater than 72 that was also their highest score. This effectively excluded 36% of the students from the analysis.

Table 1

Number of matches between specialty preference predicted by MSPI, and student's chosen specialty

Criteria / Specialty	MSPI Score > 72	MSPI is the Highest Score	MSPI is the Highest Score and > 72
Family Medicine	33/77 (43%)	36/64 (54%)	28/52 (54%)
Internal Medicine	47/89 (53%)	45/60 (75%)	34/43 (79%)
Pediatrics	33/78 (42%)	43/95 (45%)	22/44 (50%)
OBGYN	25/87 (29%)	24/88 (27%)	21/61 (34%)
Psychiatry	20/29 (69%)	24/37 (65%)	20/28 (71%)
Surgery	52/118 (39%)	67/193 (35%)	49/114 (43%)
Total Hits	210/478 (39%)	239/537 (45%)	174/341 (51%)

* Note: It is possible for a student to have more than one MSPI score greater than 72

Analysis by Specialty

Analyzing scores for individual medical specialties may help in the interpretation of all MSPI scores as it allows one to interpret profiles in context of the predictive validity for each specialty. The following results can be seen in Table 2. Internal Medicine was found to have the highest hit rate, 79%, based on the criteria for analysis three. The lowest hit rate, 27%, was recorded in the second analysis for OBGYN. Overall, Psychiatry and Internal Medicine boasted the highest hit rates, ranging from 65% - 71%, and 53% - 79%, respectively. The lowest hit rates were observed for OBGYN, which ranged from 29% - 34%. The analyses indicated that Surgery was most likely to be selected as an individual’s predicted medical specialty, averaging a prediction rate of 32%.

Table 2:

Number of Scores Satisfying Criteria for Each Analysis

Criteria / Specialty	Analysis 1: MSPI Score > 72		Analysis 2: Highest MSPI Score		Analysis 3: Highest MSPI Score > 72	
	# of Students	% of Total	# of Students	% of Total	# of Students	% of Total
Family Medicine	77	16%	64	12%	52	15%
Internal Medicine	89	19%	60	11%	43	13%
Pediatrics	78	16%	95	18%	43	13%
OBGYN	87	18%	88	16%	61	18%
Psychiatry	29	6%	37	7%	28	8%
Surgery	118	25%	193	36%	114	33%
Total	478	100%	537	100%	341	100%

The lowest predicted specialty was Psychiatry, which was predicted to be a student's medical specialty 7% of the time. To ascertain which medical specialty was most likely to be successfully predicted, hit rates for each specialty were averaged across all three analyses. Psychiatry and Internal Medicine showed the highest average hit rates, 68% and 66% respectively. The lowest hit rate, 30%, was found for OBGYN. Hit rates for the remaining specialties ranged between 14% and 18%.

In addition to examining hit rates, it is important to consider inaccurate predictions. The authors therefore, analyzed the data to determine which specialties were chosen when predicted choice and actual choice differed. The results of these analyses can be found in the appendix. Of particular note, were the results for Surgery. On average, 38% of those students predicted to enter Surgery, did in fact choose Surgery as a medical specialty. However, 40% of those students

predicted to enter Surgery chose to internal medicine instead. In this case, the percentage of incorrect predictions is greater than correct predictions.

Discussion and Conclusions

Limitations and Further Research

Despite the promising results mentioned herein, the researchers are aware of limitations of the MSPI 2nd edition, as well as issues that deserve further research. For example, the hit rate for OBGYN consistently resulted in the lowest percentage of hits, averaging 30% across the three analyses. Career advisors should pay particular attention to MSPI profiles highlighting OBGYN as a student's preference. One might ask such individuals what they specifically know about this specialty, or what sparked their interest in this area. It should be noted that, compared to 31% for Surgery, only 17% of the students had OBGYN scores that could be used in the analysis. This difference is representative of the varying, and unequal, number of student scores used to analyze the predictive validity of each specialty. Future research might examine why scores for Surgery are consistently greater than scores for any other specialty. Furthermore, given that there is a greater percentage of incorrect predictions for Surgery, the authors suggest a more detailed analysis of profile scores for these particular students.

Conclusions

Given the magnitude of a medical student's career decision, it is important to provide quality instruments to assist individuals in choosing a medical specialty. This study investigated the predictive ability of the MSPI. By examining hits based on different criteria, one can determine the rules, or criteria, that result in the highest percentage of matches. The criteria can then be used by career counselors to interpret MSPI scores and advise medical students. The analysis found that using a student's highest MSPI score that was also greater than 72 was the

best predictor of an individual's chosen specialty, resulting in a 51% hit rate. This far exceeds the hit rate one would expect to see by chance based on a six category system. One should note however, that using these criteria excluded almost 50% of the students from the analysis, because those individuals did not have any MSPI scores greater than 72. Consequently, it might be beneficial to use a student's highest MSPI score as this permits the inclusion of all students in the analysis. Using the highest MSPI score resulted in a hit rate of 45%, and although the hit rate decreased by 6%, the number of students used in the analysis increased by almost 50%. Overall, the results of the analysis demonstrate the strong predictive validity of the MPSI for use in predicting a medical student's future specialty choice. The authors therefore, recommend the use of the MSPI 2nd edition as an instrument to assist medical students in determining a medical specialty.

Suggested Additional Readings

Savickas, M. L.; Brizzi, J. S.; Brisbin, L. A. & Pethtel, L. L. Predictive validity of two medical specialty preferences. Measurement and evaluation in counseling and development. October 1988; Vol 21, 106-112.

Zimny, G. H. (2002). Updating the Medical Specialty Preference Inventory. Unpublished manuscript.

Zimny, G.H. Predictive validity of the Medical Specialty Preference Inventory. Medical Education, 1980; 14:414-418.

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Appendix

Chosen Specialty When Predicted Choice = Family Medicine						
Criteria based on Family Medicine	Family	Pediatrics	Internal	OBGYN	Surgery	Psychiatry
MSPI Score > 72	33 of 77 (43%)	15 of 77 (19%)	16 of 77 (21%)	4 of 77 (5%)	4 of 77 (5%)	5 of 77 (6%)
Highest Score	36 of 64 (56%)	8 of 64 (13%)	9 of 64 (14%)	5 of 64 (8%)	2 of 64 (3%)	4 of 64 (6%)
Highest Score > 72	28 of 52 (54%)	8 of 52 (15%)	7 of 52 (13%)	4 of 52 (8%)	2 of 52 (4%)	3 of 52 (6%)

Chosen Specialty When Predicted Choice = Internal Medicine						
Criteria based on Internal Medicine	Internal	Family	Pediatrics	OBGYN	Surgery	Psychiatry
MSPI Score > 72	47 of 89 (53%)	18 of 89 (20%)	12 of 89 (13%)	2 of 89 (2%)	8 of 89 (9%)	2 of 89 (2%)
Highest Score	45 of 60 (75%)	2 of 60 (3%)	7 of 60 (12%)	0 of 60 (0%)	4 of 60 (7%)	2 of 60 (3%)
Highest Score > 72	34 of 43 (79%)	1 of 43 (2%)	3 of 43 (7%)	0 of 43 (0%)	4 of 43 (9%)	1 of 43 (2%)

Chosen Specialty When Predicted Choice = Pediatrics						
Criteria based on Pediatrics	Pediatrics	Family	Internal	OBGYN	Surgery	Psychiatry
MSPI Score > 72	33 of 78 (42%)	17 of 78 (22%)	19 of 78 (24%)	2 of 78 (3%)	2 of 78 (3%)	5 of 78 (6%)
Highest Score	43 of 95 (45%)	21 of 95 (22%)	20 of 95 (21%)	5 of 95 (5%)	1 of 95 (1%)	5 of 95 (5%)
Highest Score > 72	22 of 44 (50%)	10 of 44 (23%)	8 of 44 (18%)	1 of 44 (2%)	0 of 44 (0%)	3 of 44 (7%)

Chosen Specialty When Predicted Choice = OBGYN						
Criteria based on OBGYN	OBGYN	Family	Internal	Pediatrics	Surgery	Psychiatry
MSPI Score > 72	25 of 87 (29%)	16 of 87 (18%)	13 of 87 (15%)	23 of 87 (26%)	3 of 87 (3%)	7 of 87 (8%)
Highest Score	24 of 88 (27%)	16 of 88 (18%)	15 of 88 (17%)	20 of 88 (23%)	5 of 88 (6%)	8 of 88 (9%)
Highest Score > 72	21 of 61 (34%)	11 of 61 (18%)	8 of 61 (13%)	13 of 61 (21%)	2 of 61 (3%)	6 of 61 (10%)

Chosen Specialty When Predicted Choice = Psychiatry						
Criteria based on Psychiatry	Psychiatry	Family	Internal	Pediatrics	Surgery	OBGYN
MSPI Score > 72	20 of 29 (69%)	0 of 29 (0%)	4 of 29 (14%)	5 of 29 (17%)	0 of 29 (0%)	0 of 29 (0%)
Highest Score	24 of 37 (65%)	2 of 37 (5%)	6 of 37 (16%)	5 of 37 (14%)	0 of 37 (0%)	0 of 37 (0%)
Highest Score > 72	20 of 28 (71%)	0 of 28 (0%)	4 of 28 (14%)	4 of 28 (14%)	0 of 28 (0%)	0 of 28 (0%)

Chosen Specialty When Predicted Choice = Surgery						
Criteria based on Surgery	Surgery	Family	Internal	Pediatrics	OBGYN	Psychiatry
MSPI Score > 72	52 of 132 (39%)	6 of 132 (5%)	53 of 132 (40%)	12 of 132 (9%)	8 of 132 (6%)	1 of 132 (1%)
Highest Score	67 of 193 (35%)	11 of 193 (6%)	82 of 193 (42%)	21 of 193 (11%)	11 of 193 (6%)	1 of 193 (1%)
Highest Score > 72	49 of 114 (43%)	6 of 114 (5%)	40 of 114 (35%)	10 of 114 (9%)	8 of 114 (7%)	1 of 114 (1%)