

Attitudes towards biopsychosocial concerns in primary care: Prediction, gender and changes across cohorts

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Abstract - The Washington Primary Care Interest Inventory (WPCII) assesses student attitudes regarding the appropriateness of a range of biopsychosocial concerns for which a patient might seek care from a primary care provider. The WPCII holds promise for understanding the relationship between attitudes, career choice, gender, and cohort.

Methods: We longitudinally examined WPCII scores across medical school cohorts and by gender. We also explored the influence of attitudes in predicting career choice.

Results: Four findings emerged. First, WPCII scores were positively associated with student preferences for primary care specialties. Second, across 14 years, there has been a significant upward trend in WPCII scores. Third, women exhibit higher scores on the WPCII. Finally, WPCII scores at the start of medical school show some ability to predict student residency match.

Discussion: We discuss the WPCII's promise for understanding shifts in career choice and the influence of gender in selecting primary care specialties.

The last 15 years have witnessed shifts, both positive and negative, in the attitudes students hold toward careers in primary care. Primary care physicians act as a first point of contact, are accountable for addressing a wide variety of patient concerns and hold responsibility for providing accessible, comprehensive and continuing care. During the early 1990's, concerns were voiced that respect for primary care practitioners had diminished.^{1, 2} In response, the Task Force on Student Interest and the Student Interest Initiative efforts of the American Academy of Family Physicians sought to bolster positive attitudes by stimulating pre-medical school interest by improving accessibility to the family practice role through preceptorships and mentoring opportunities. In addition, the Robert Wood Johnson Generalist's Physician Initiative was enacted to remedy the declining proportion of medical students interested in primary care careers. These efforts were partially successful, and by the mid-1990s medical educators reported that attitudes had improved and that students inclined to practice in primary care settings had reached a level not seen since 1980.³ Unfortunately, this positive shift did not continue, and for six consecutive years (1998 – 2003) the number of students matching to family practice residencies has declined.^{4,5} Multiple reasons have been postulated to explain the declining proportion of students entering primary care residencies,⁶ including perceptions of diminishing economic reward,⁷ increasing financial

debt at graduation,^{8, 9} and declining attitudes toward the socio-emotional and psychosocial aspects of primary care resulting from negative experiences in undergraduate medical education.¹⁰

In contrast to these shifting attitudes, opportunities for primary care practitioners have generally remained plentiful, especially for careers serving rural and underserved populations.¹¹ This climate of opportunity and societal need, accompanied by a fluctuating student orientation to primary care specialties, raises questions on how to best balance this disparity. This concern is especially salient to schools such as the University of Washington's School of Medicine (UWSOM), whose principal mission is the training of primary care physicians.

Unfortunately, the need for primary care physicians is an easily stated problem for which the solution is complex. At the most basic level, it is an issue of selecting students for whom primary care represents a likely career path and then encouraging and fostering positive attitudes toward primary care specialties throughout training. Reports have demonstrated that student gender, beliefs regarding a positive association between social factors and illness, and positive attitudes regarding health promotion correlate to student plans to specialize in preventive medicine or primary care.¹² Owen, Hayden and Connors¹³ reported that out of a series of

academic, demographic and personal characteristics only gender and higher levels of community service predicted a primary care career path among medical students. Advocating for a multivariate approach to studying career choice, Lawson et al.¹⁴ applied a theoretical decision-making model and found gender to predict entrance into pediatric residencies, but that this finding did not hold for family medicine or internal medicine.

In our work, we have taken an attitudinal approach to understanding influences on student decisions to elect careers in primary care. We define attitudes as evaluative (desirable or undesirable) judgments. These judgments may predispose a person to behave in a particular fashion. In 1989, we developed the Washington Primary Care Interest Inventory (WPCII)¹⁵ to assess student attitudes toward what constitutes appropriate concerns for which a patient might approach his/her family doctor. We wanted to assess how students entering medical school perceived the appropriateness of various psychosocial concerns common to family practice (for example, divorce, spousal abuse, and loneliness). The WPCII was not intended to represent a test of knowledge or to assess students' attitudes toward their own chosen specialty, but to gauge general attitudes towards common concerns that arise in primary care practice. We hypothesized students holding more narrowly defined conceptions of primary care would be more inclined to react negatively to their encounters with the host of psychosocial concerns confronting providers. Conversely, we believed that students holding broader expectations would be more likely to have their beliefs and positive attitudes reinforced by undergraduate training.

In this paper, we address 4 questions. First, do attitudes towards what constitutes appropriate concerns within the practice of primary care predict early inclination to enter primary care specialties? Second, have these attitudes changed across the past 14 years? Third, do attitudes differ by gender, and are these differences consistent across cohorts? Investigators have noted a significant gender bias, with women being more likely to express early inclinations toward primary care and to enter primary care specialties.¹² Finally, do the attitudes of students entering medical school predict later career choice?

Methods

Each year, entering University of Washington School of Medicine (UWSOM) students complete a battery of questionnaires assessing career

preferences, interests, and attitudes. This battery includes the Washington Primary Care Interest Inventory,¹⁵ which has been administered to each entering cohort of students since 1989 with the exception of 1992 when the instrument was mistakenly not administered. From 1995-2002, students were also asked to name their preferred medical specialty and to estimate their certainty that they would actually practice within this specialty. In addition to data collected at entrance to medical school, we have included National Resident Matching Program (NRMP) data from 1993 to 2003 to examine the relationship between attitudes reported on the WPCII and later match choice.

Instrument - The WPCII consists of 40 items whose score is interpretable as a single global score or by one of 4 factor-analytically derived subscales (Appendix A). Students are asked to respond to the appropriateness of a variety of common biopsychosocial concerns for which a patient might approach his/her family physician. The WPCII uses a 5-point Likert-type scale with response options ranging from (1) Very Undesirable to (5) Very Desirable. The 4 subscales are respectively labeled Social, Biomedical, Familial, and Emotional. The WPCII total score ($\alpha=0.96$) and each of the 4 subscales demonstrate high reliability (range $\alpha = 0.80-0.95$).

The subscales differ marginally from the original scales reported by Brock et al.¹⁵ resulting from the increasingly stable factor analyses undertaken in validating these subscales with significantly larger numbers of students who had completed the instrument. This re-analysis also revealed an interpretable fourth factor. Principal components analysis was first used to discover the number of interpretable factors (eigenvalue > 1 criterion and supported by inspection of the scree chart). These factors were then subjected to a principal axis factoring analysis with orthogonal (varimax) rotation. Items with loadings greater than .45 were considered interpretable and used to create subscales. In the 2 cases where an item loaded on multiple factors, the larger loading was selected for scale construction.

A three-way ANOVA was conducted to assess the relationship between early stated inclination to enter primary care specialties, gender, and cohort with student-reported certainty in their career choice. A stepwise logistic regression was conducted to assess the relationship between the WPCII subscales, gender, and cohort on the prediction of inclination to practice in primary care specialties. Two-way

ANOVAs (gender by cohort) were used to assess the relationship between gender and cohort and each of the WPCII subscales. A logistic regression was used to assess the contributions of gender, cohort and the WPCII subscales to predicting student specialty match at graduation.

Results

Across the 13 cohorts, 1848 of 2210 (83.6%) students completed the WPCII, an average of 142 per cohort with a range from 58 to 174 per cohort. Of the respondents, 49% were women and 51% were men. This was not significantly different from the demographics of all UWSOM students (Table 1). To simplify reporting of cohort differences and eliminate more temporal fluctuations, we report response data in 7 two-year batches (1989-1990, 1991-1992, 1993-1994, 1995-1996, 1997-1998, 1999-2000, and 2001-2002). Table 2 presents the average WPCII total score and each of the WPCII subscales, for each two-year batch broken out by gender.

Table 1: University of Washington School of Medicine demographics from 1989 – 2002

| Year | Average Age | Percent Male | Percent Female | Total Number |
|-------|-------------|--------------|----------------|--------------|
| 1989 | 24.75 | 64.85 | 35.15 | 165 |
| 1990 | 24.64 | 53.99 | 46.01 | 163 |
| 1991 | 24.86 | 58.18 | 41.82 | 165 |
| 1992 | 24.78 | 46.67 | 53.33 | 165 |
| 1993 | 24.06 | 56.36 | 43.64 | 165 |
| 1994 | 24.68 | 53.33 | 46.67 | 165 |
| 1995 | 24.75 | 50.60 | 49.40 | 166 |
| 1996 | 24.65 | 49.69 | 50.31 | 163 |
| 1997 | 24.96 | 51.70 | 48.30 | 176 |
| 1998 | 25.17 | 57.65 | 42.35 | 170 |
| 1999 | 25.60 | 42.60 | 57.40 | 169 |
| 2000 | 24.88 | 50.29 | 49.71 | 175 |
| 2001 | 25.01 | 42.05 | 57.95 | 176 |
| 2002 | 25.02 | 44.07 | 55.93 | 177 |
| Total | 24.84 | 51.48 | 48.52 | 2360 |

Do the WPCII scores predict an early stated inclination for primary care? - Beginning in 1995, students entering medical school were asked to select their current preferred medical specialty and to provide a level of certainty that they would practice in this field. Of the 1129 students who responded, 64% reported an interest in primary care specialties (defined for this study as family practice, pediatrics, internal medicine) or in obstetrics/gynecology where physicians commonly serve in the role as a primary care provider. Thirty percent reported an interest in non-primary care specialties (for example, surgery). The remaining 6% were undecided. Student certainty that they would practice in their preferred medical specialty was assessed on a 5-point Likert-type scale

with response options ranging from (1) Not at all certain to (5) Absolutely certain. A three-way ANOVA (Table 3) was conducted to assess differences in career certainty across cohort, gender and preferred specialty. Gender was not a significant predictor of certainty ($p > .10$). Significant differences were noted both for cohort ($F(3,1145) = 3.44, p < .05$) and for preferred specialty choice ($F(1,1145) = 23.67, p < .001$). Students who planned on non-primary care specialties and students in more recent cohorts expressed less certainty in their career choice. There were no statistically significant interactions ($p = .05$).

Stepwise logistic regression was then used to study the relationship between the WPCII subscale scores, gender, and year of data collection in predicting stated preference for a primary care career (Table 4). The dependent variable (student preference for primary care) was dichotomous with a value of zero for a plan to enter a non-primary care specialty, and a value of one for a plan to enter primary care. The 6 variables were allowed to enter in a stepwise fashion. The final model was significant (model $\chi^2(3) = 85.89, p < .001$). Gender, the Social subscale of the WPCII, and cohort each remained as significant predictors in the equation. The final equation demonstrated that women were 2.44 times more likely than men to report a preference for primary care after adjusting for cohort and the Social subscale of the WPCII. This analysis further revealed a trend for a higher percentage of students in earlier cohorts to express an inclination towards primary care careers than did later cohorts. Students expressing an inclination towards primary care practice were significantly more likely than their counterparts (those expressing inclination toward non-primary care specialties) to have higher scores on the Social subscale. The variance explained ($R^2 = .14$) was approximated using the Aldrich and Nelson¹⁶ measure to assess strength of association applying the Hagle and Mitchell adjustment. The adjustment compensates for the tendency of the Aldrich and Nelson measure to underestimate model strength.¹⁷ This corrected measure approximates R^2 calculated in multiple linear regressions.

Do WPCII scores vary by gender and cohort? - Two-way ANOVAs (gender X cohort) were used to assess changes in WPCII attitudes across cohorts and gender. Separate analyses were conducted with the WPCII total score and with each subscale acting as dependent variables. Group means and standard deviations are provided in Table 2. Table 5 provides the ANOVA results for each analysis.

Table 2: WPCII Total and subscale means and standard deviations by gender and cohort grouping

| | | WPCII Scales | | | | | | | | | | |
|---------------------|--------|--------------|------|--------|------|------------|------|----------|------|-----------|------|------|
| | | Total | | Social | | Biomedical | | Familial | | Emotional | | |
| Cohort | Gender | M | SD | M | SD | M | SD | M | SD | M | SD | n |
| 1989-1990 | Male | 3.08 | 0.53 | 2.23 | 0.66 | 4.02 | 0.53 | 3.59 | 0.87 | 2.98 | 0.85 | 139 |
| | Female | 3.13 | 0.60 | 2.22 | 0.80 | 4.06 | 0.60 | 3.79 | 0.87 | 3.11 | 0.84 | 106 |
| 1991-1992 | Male | 3.07 | 0.47 | 2.18 | 0.59 | 4.03 | 0.47 | 3.53 | 0.89 | 3.03 | 0.82 | 84 |
| | Female | 3.12 | 0.60 | 2.25 | 0.79 | 3.99 | 0.70 | 3.81 | 0.88 | 3.08 | 0.88 | 61 |
| 1993-1994 | Male | 3.13 | 0.61 | 2.28 | 0.75 | 4.06 | 0.64 | 3.62 | 0.87 | 3.10 | 0.89 | 159 |
| | Female | 3.34 | 0.61 | 2.45 | 0.78 | 4.26 | 0.54 | 4.00 | 0.83 | 3.27 | 0.96 | 127 |
| 1995-1996 | Male | 3.22 | 0.53 | 2.35 | 0.66 | 4.13 | 0.55 | 3.77 | 0.82 | 3.24 | 0.80 | 98 |
| | Female | 3.35 | 0.58 | 2.46 | 0.75 | 4.25 | 0.64 | 4.02 | 0.82 | 3.29 | 0.96 | 92 |
| 1997-1998 | Male | 3.23 | 0.57 | 2.32 | 0.75 | 4.17 | 0.60 | 3.90 | 0.82 | 3.30 | 0.81 | 174 |
| | Female | 3.45 | 0.63 | 2.61 | 0.83 | 4.27 | 0.60 | 4.13 | 0.76 | 3.47 | 0.86 | 151 |
| 1999-2000 | Male | 3.30 | 0.62 | 2.42 | 0.76 | 4.19 | 0.59 | 3.92 | 0.89 | 3.46 | 0.82 | 154 |
| | Female | 3.36 | 0.54 | 2.47 | 0.73 | 4.22 | 0.61 | 4.07 | 0.75 | 3.48 | 0.82 | 174 |
| 2001-2002 | Male | 3.19 | 0.47 | 2.26 | 0.63 | 4.17 | 0.49 | 3.87 | 0.78 | 3.33 | 0.84 | 142 |
| | Female | 3.41 | 0.57 | 2.50 | 0.75 | 4.27 | 0.54 | 4.22 | 0.67 | 3.48 | 0.89 | 184 |
| All Students | | 3.26 | 0.58 | 2.37 | 0.74 | 4.16 | 0.58 | 3.90 | 0.84 | 3.29 | 0.87 | 1845 |

Table 3: Analysis of variance results for main effects and interaction effects of gender, cohort, and inclination to practice in a primary care specialty on student reported certainty in their beliefs

| Variable | df | MS | F | eta ² |
|---------------------------------|------|-------|----------|------------------|
| Main effect of gender (Sex) | 1 | .12 | .12 | .00 |
| Main effect of cohort (Year) | 3 | 3.46 | 3.44* | .01 |
| Main effect of inclination (IN) | 1 | 23.80 | 23.67*** | .02 |
| Sex by Year | 3 | .68 | .69 | .00 |
| Sex by IN | 1 | .34 | .34 | .00 |
| Year by IN | 3 | .70 | .69 | .00 |
| Sex by Year by IN | 3 | 1.51 | 1.50 | .00 |
| Within-cells error | 1145 | 1.01 | | |

*P < .05, **P < .01, ***P < .001

Table 4: Stepwise logistic regression predicting early preference for a primary care career from gender, cohort and the WPCII subscales

| Variables in the equation | β | SE | Odds ratio | 95% CI | Wald |
|---------------------------|-------|-----|------------|-----------|----------|
| Gender | .89 | .14 | 2.44 | 1.84-3.23 | 38.97*** |
| Cohort | -.28* | .07 | .76 | 0.67-0.87 | 16.83 |
| WPCII Social | .52* | .11 | 1.68 | 1.36-2.07 | 23.61*** |

*P < .05, **P < .01, ***P < .001

Table 5: Analysis of variance results for main effects and interaction effects of gender and cohort on the WPCII Total, Social, Biomedical, Familial, and Emotional subscales

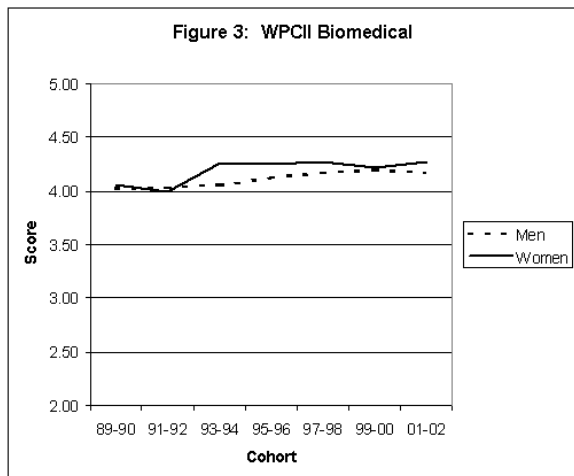
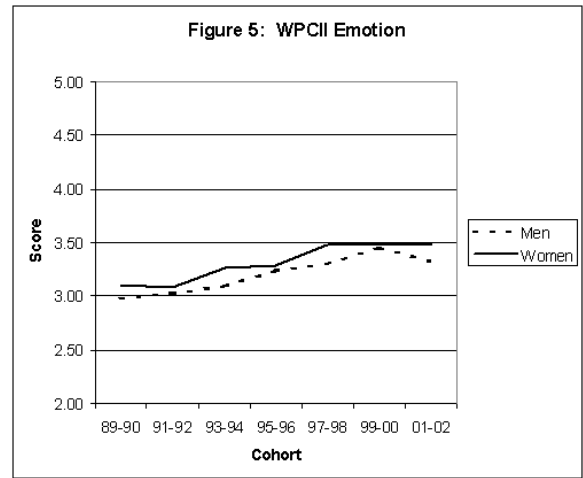
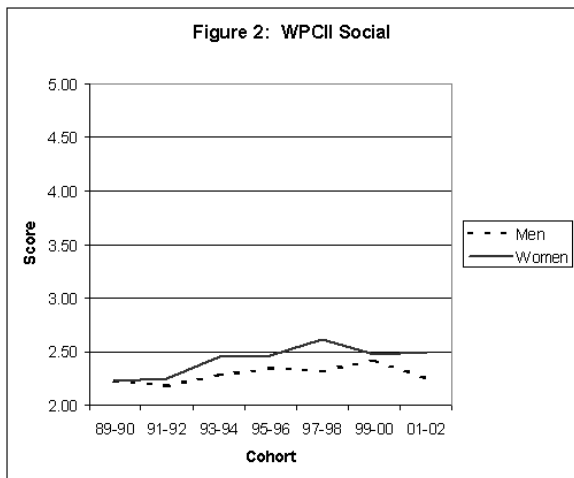
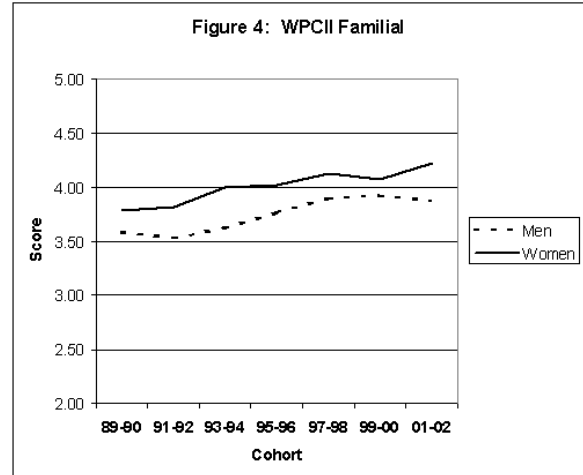
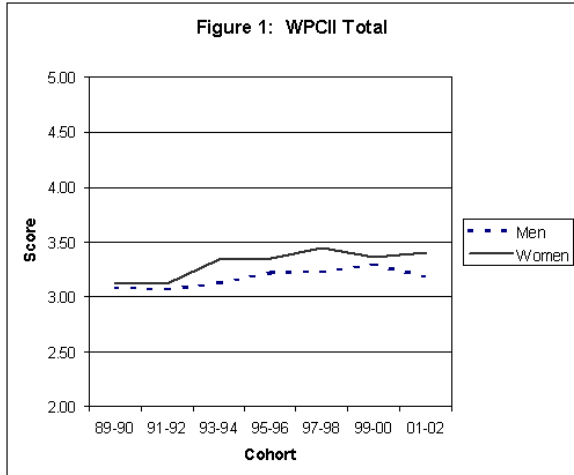
| WPCII Total Score | df | MS | F | eta² |
|--------------------------|-----------|-----------|----------|------------------------|
| Main effect of cohort | 6 | 2.28 | 7.01*** | .02 |
| Main effect of gender | 1 | 7.41 | 22.79*** | .01 |
| Cohort by Gender | 6 | .47 | 1.43 | .00 |
| Within-cells error | 1831 | | | |
| WPCII Social | df | MS | F | eta² |
| Main effect of cohort | 6 | 2.24 | 4.14*** | .01 |
| Main effect of gender | 1 | 7.13 | 13.17*** | .01 |
| Cohort by Gender | 6 | .80 | 1.48 | .00 |
| Within-cells error | 1831 | | | |
| WPCII Biomedical | df | MS | F | eta² |
| Main effect of cohort | 6 | 1.60 | 4.79*** | .02 |
| Main effect of gender | 1 | 2.50 | 7.49*** | .00 |
| Cohort by Gender | 6 | .33 | .98 | .00 |
| Within-cells error | 1831 | | | |
| WPCII Familial | df | MS | F | eta² |
| Main effect of cohort | 6 | 5.78 | 8.68*** | .03 |
| Main effect of gender | 1 | 29.62 | 44.45*** | .02 |
| Cohort by Gender | 6 | .49 | .73 | .00 |
| Within-cells error | 1831 | | | |
| WPCII Emotional | df | MS | F | eta² |
| Main effect of cohort | 6 | 7.16 | 9.72*** | .03 |
| Main effect of gender | 1 | 4.65 | 6.32* | .00 |
| Cohort by Gender | 6 | .29 | .39 | .00 |
| Within-cells error | 1831 | | | |

*P < .05, **P < .01, ***P < .001

In predicting the WPCII total score, significant main effects were noted for both gender ($F(1,1831) = 22.79, p < .001$) and for cohort ($F(6, 1831) = 7.01, p < .001$). The interaction was not significant. Women across cohorts tended to have higher WPCII total scores, and a positive trend exists to higher WPCII scores in more recent cohorts. Similar significant results for gender were found when examining the Social ($F(1, 1831) = 13.17, p < .001$), Biomedical ($F(1, 1831) = 7.49, p < .01$), Familial ($F(1, 1831) = 44.45, p < .001$) and Emotional ($F(1, 1831) = 6.32, p < .05$) subscales. Significant main effects for cohort were demonstrated for the Social ($F(6, 1831) = 4.14, p < .001$), Biomedical ($F(6, 1831) = 4.79, p < .001$), Familial ($F(6, 1831) = 8.68, p < .001$) and the Emotional ($F(6, 1831) = 9.72, p < .001$) subscales. There were no significant interactions ($p = .05$). Following the interpretative guidelines offered by Cohen¹⁸, partial η^2 values from .01 - .03 represent small but interpretable effect sizes. However, in practice medium effect sizes may be attenuated due to measurement error and be reflected as small effect sizes. Further examination is required to better understand the meaning and strength of these associations. Figures 1 to 5 provide means scores broken out by gender for the WPCII total score and each of the subscales.

Three findings warrant consideration. First, across cohorts and for all subscales, women exhibited higher WPCII scores than men. Second, across time, matriculated students at the UWSOM have demonstrated increasing scores on the WPCII and its subscales. Third, differences between men and women, while variable, are relatively consistent across time. This finding was supported by the absence of significant interactions between gender and cohort for any of the WPCII scores.

Do WPCII scores, initial preference for primary care, and gender predict match? - As previously reported, initial inclination to a primary care specialty, gender, and positive attitudes towards the more psychosocial aspects of care each predict career choice.¹² To examine whether WPCII attitudes predicted later match choice, we conducted a logistic regression to determine the impact of the 4 WPCII subscales, gender, and stated career preference at entrance to medical school using 5 one-year cohorts (1995, 1996, 1997, 1998, and 1999) in predicting match. These represent the 5 cohorts for which we had completed NRMP match data. The 6 predictor-variables were entered as a block in prediction of match (Table 6). The full model was significant (model $\chi^2(6) = 54.51, p < .001$). The final



equation demonstrated that women were 1.92 times more likely than men to match to primary care specialties after adjusting for early stated inclination and the subscales of the WPCII. Further inspection of Table 6 reveals students who stated an early inclination for primary care were 2.77 times more likely than students who stated an early preference for non-primary care specialties to match to primary care specialties. Students matching to primary care were significantly more likely than their counterparts (matching to non-primary care specialties) to have higher scores on the Social subscale, but were likely to have lower scores on the Emotional subscale. The variance explained ($R^2 = .18$) was approximated using the Aldrich and Nelson measure applying the Hagle and Mitchell adjustment.

Table 6: Logistic regression predicting career match (primary care versus non-primary care) from early inclination to practice in a primary care specialty, gender, and the WPCII subscales

| Variables in the equation | β | SE | Odds ratio | 95% CI | Wald |
|---------------------------|---------|-----|------------|-----------|----------|
| Gender | .65 | .21 | 1.92 | 1.26-2.91 | 9.29** |
| Primary Care Inclination | 1.02 | .22 | 2.77 | 1.79-4.29 | 21.13*** |
| WPCII Social | .40 | .18 | 1.49 | 1.05-2.11 | 5.05* |
| WPCII Biomedical | .36 | .26 | 1.43 | .86-2.39 | 1.87 |
| WPCII Familial | .08 | .17 | 1.08 | .78-1.49 | .21 |
| WPCII Emotional | -.38 | .19 | .68 | .47-1.00 | 3.91* |

*P < .05, **P < .01, ***P < .001

Discussion

The shortage of primary care physicians in impoverished rural and urban communities is a significant societal problem. Periodic dips in the perceived desirability of primary care specialties, erosion of positive student attitudes towards primary care over the course of undergraduate training, and an associated reduction in the number of students selecting primary care pathways exacerbate these shortages. In this paper, we demonstrate how attitudes regarding what constitutes appropriate care predict both inclinations towards primary care and ultimate career path.

We report attitudinal shifts across cohorts at a major medical school whose mission is the training of primary care physicians. In short, students in the early 1990's perceived primary care in narrower terms, placing less emphasis on the psychosocial aspects of care and relatively more emphasis on the biomedical aspects of care. Later cohorts have perceived the profession in broader terms, especially with regard to the emotional and family complaints with which a patient might approach a family doctor. The trend has not been strictly linear and is moderated by gender, with the most significant positive changes occurring in the early 1990's, and more gradual change occurring across the past 8 years.

Most importantly, we have demonstrated a connection between early attitudes and subsequent behavior. Differences in the perception of the breadth of the practice of primary care predicted career choice, even when jointly accounting for early inclination. Should early attitudes about patient social and emotional concerns that emerge in practice effect career choice? Perhaps early recognition of the wide breadth of what constitutes primary care practice results in fewer broken student expectations across undergraduate medical education. Students who are interested in primary care, but hold narrowly defined conceptions of practice, may reconcile the dissonance they feel when first encountering the weight of psychosocial and emotional concerns by altering their attitudes regarding the desirability of primary care practice. Conversely, students who start medical school believing that primary care practice is broader in scope do not experience this same dissonance, and rather than feeling distress when discovering the scope of the discipline, perhaps feel reinforced in their belief systems. The findings reported by Zinn et al.,¹⁰ are analogous. These researchers reported that across undergraduate medical education and residency, students reported increasingly negative attitudes towards the socio-emotional and psychosocial aspects of care. These declines were hypothesized to be a result of practical experiences. A second explanation is also possible. Students who plan to enter primary care and exhibit broader attitudes towards its scope may represent a better fit to the profession. To these students, diversity in the practice of primary care might be inherently enriching and satisfying and not an unhappy discovery upon contact with patients. We might hypothesize that the declining satisfaction ratings reported by Zinn and his colleagues would be less pronounced in students who initially viewed their future profession in broader terms.

The question remains as to whether the WPCII will prove useful in recruiting students that are more likely to continue on to primary care careers. Our findings certainly suggest that educators should give additional consideration to social attitudinal variables in developing selection processes. However, the predictive power of our subscales is not sufficient to warrant a prominent role in this process. Instead, we recommend that researchers evaluating selection processes seek out and administer attitudinal measures that may capture an association between perceived practice and the reality of clinical practice. These efforts could be used to better understand the relationship between social attitudes and decision making with the ultimate aim of more fully delineating and leveraging the role of these variables in prediction of career selection.

While our results suggest significant attitudinal shifts, and that these same attitudes predict career choice, the findings should be interpreted cautiously. First, we have examined students from a single institution with a clear mandate to select and train students who are likely to become primary care providers. Second, while the findings are statistically significant, the magnitude of these findings is somewhat modest. We believe this results from the inherent underlying complexity of attempting to link attitudes to meaningful behaviors, such as selecting a career path. In conclusion, any caveats must be contrasted with some suggestive and potentially important findings. Namely, a simple assessment of attitudes was able to show significant differences between students, not only at the time of administration, but also in predicting career choice. Demonstrating a significant relationship between specific attitudes, gender, and early belief patterns in the prediction of significant behavior warrants additional study. However, the results we report here are just a beginning, and perhaps our findings raise more questions than they answer. To fully understand the complex relationship between attitudes and behavior, researchers must gain a heightened understanding of which attitudes are most important to consider. Understanding student attitudes towards what constitutes practice might prove an important next step in this process.

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Appendix A

Summary of items and factor loadings for principal axis factoring, orthogonal four factor solution for the Washington Primary Care Interest Inventory

| Item | Factor Loading | | | |
|--------------------------------------|----------------|-------------|-------------|-------------|
| | Social | Biomedical | Familial | Emotional |
| Unemployment | 0.87 | 0.04 | 0.00 | 0.00 |
| Divorce | 0.83 | 0.05 | 0.17 | 0.04 |
| Financial Problems | 0.81 | -0.02 | 0.09 | 0.02 |
| Decision Regarding Employment | 0.78 | -0.03 | 0.03 | 0.07 |
| Marriage Problems | 0.77 | 0.06 | 0.18 | 0.22 |
| Retirement | 0.75 | 0.03 | 0.10 | 0.08 |
| Difficulty Maintaining Relationships | 0.75 | 0.17 | 0.10 | 0.15 |
| Shyness | 0.73 | 0.09 | 0.04 | 0.23 |
| Work Problems | 0.70 | 0.22 | 0.03 | 0.02 |
| Decision Regarding Personal Life | 0.70 | 0.06 | 0.11 | 0.18 |
| Loneliness | 0.64 | 0.11 | 0.21 | 0.35 |
| Child Discipline Problems | 0.61 | 0.09 | 0.24 | 0.30 |
| Anger Management | 0.61 | 0.24 | 0.16 | 0.20 |
| Low Self-Esteem | 0.59 | 0.16 | 0.23 | 0.49 |
| Death in the family | 0.55 | 0.16 | 0.36 | 0.16 |
| Minor Weight Change | 0.48 | 0.35 | -0.08 | 0.08 |
| Stress Management | 0.47 | 0.28 | 0.25 | 0.31 |
| Dying Family Member | 0.39 | 0.18 | 0.38 | 0.10 |
| Tiredness or Fatigue | 0.15 | 0.72 | 0.11 | 0.23 |
| Difficulty Sleeping | 0.16 | 0.69 | 0.12 | 0.11 |
| Loss of Appetite | 0.15 | 0.68 | 0.01 | 0.04 |
| Headache | 0.14 | 0.67 | 0.02 | 0.04 |
| Diet Problems | 0.14 | 0.67 | 0.18 | 0.25 |
| Dizzy Spells | -0.16 | 0.65 | 0.22 | 0.01 |
| Overweight | 0.10 | 0.62 | 0.27 | 0.20 |
| Menopause | -0.05 | 0.59 | 0.39 | 0.13 |
| Mood Swings | 0.17 | 0.52 | 0.21 | 0.51 |
| Long Term Pain | -0.21 | 0.48 | 0.33 | 0.08 |
| Nervousness and Tension | 0.28 | 0.47 | 0.26 | 0.43 |
| Sexual Problems | 0.17 | 0.45 | 0.34 | 0.29 |
| Planning a Family | 0.33 | 0.39 | 0.21 | -0.08 |
| Lack of Exercise | 0.36 | 0.39 | 0.13 | 0.20 |
| Child Abuse or Neglect | 0.24 | 0.16 | 0.71 | 0.15 |
| Spouse Abuse | 0.38 | 0.14 | 0.59 | 0.12 |
| Child Develop Problems | 0.05 | 0.33 | 0.53 | 0.15 |
| Depression | 0.13 | 0.36 | 0.52 | 0.32 |
| Birth Control Counseling | 0.09 | 0.42 | 0.47 | 0.01 |
| Crying Spells | 0.40 | 0.30 | 0.24 | 0.54 |
| Irrational Fears | 0.38 | 0.27 | 0.23 | 0.54 |
| Inability to Concentrate | 0.33 | 0.43 | 0.10 | 0.46 |
| Alpha Reliability for Subscales | 0.95 | 0.90 | 0.80 | 0.80 |
| Alpha Reliability for all Items | 0.96 | | | |

Note: Boldface indicates items used to develop subscales