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Personality and Occupational Specialty: An Examination of Medical Specialties using Holland's

RIASEC Model

Stephen A. Woods PhD,

Surrey Business School, University of Surrey

Fiona Patterson PhD

Cambridge University & Work Psychology Group

Anna Koczwara PhD

Work Psychology Group

&

Bart Wille PhD

Ghent University

Address for Correspondence:

Stephen A. Woods Ph.D.
People and Organizations Department
Surrey Business School
University of Surrey
Guildford
Surrey
GU2 7XH, UK
s.a.woods@aston.ac.uk

Abstract

Purpose: The purpose of this study was to re-examine the role of personality in occupational specialty choice, to better understand how and in what ways personality traits might influence vocational development after a person has chosen a career.

Design/Methodology/Approach: The study tested hypotheses in a sample of UK medical students, each of whom had chosen their specialty pathway, and completed a measure of the Big Five personality traits. Associations of the junior doctor's Big Five personality traits with the Holland RIASEC (Realistic, Investigative, Artistic, Social, Enterprising, Conventional) profiles of their medical specialty selections (derived from the O*NET database) were examined.

Findings: Findings provided good support for our hypotheses. Junior doctors' Agreeableness (with Social) and Neuroticism (with Realistic, Artistic, and Enterprising) were the main predictors of the RIASEC profiles of their specialty selections.

Research Implications: The findings suggest that personality traits influence specialty selection in predictable ways, and differently compared to occupational choice. The paper discusses findings within a theoretical framework that explains how and why trait influences on within-occupational specialty selection differ from influences on occupational interest and choice more broadly. The potential mechanisms underlying these associations are explored in the context of motivational aspects of Agreeableness and Neuroticism.

Practical Implications: Within-occupation specialties should feature in career guidance discussions and interventions more explicitly to enable people to decide whether occupational specialties are available that appeal to their individual differences.

Originality/Value: This is the first study to examine the relations of personality and occupational specialty through the lens of the RIASEC model, and the first to propose cross-

occupation theoretical pathways from personality to specialty choice. The data from the field of

medicine enable us to test our propositions in a suitably diverse set of occupational specialties.

Keywords: Occupational Specialty; Personality; Big Five; Holland RIASEC; Medical Specialties

How do personality traits influence people's vocational behavior once they have chosen an occupation? There is a wealth of research evidence examining the influences of personality on occupational interests and choices. Studies have shown, for instance, that significant personality differences exist between students from different college majors (e.g., De Fruyt & Mervielde, 1996). However, entry into an occupation today often involves a two-step process whereby individuals first choose a broad occupational field, such as psychology, engineering, law, or medicine, and then specify a specialty domain of work within that occupation such as counseling, architecture, international law, or cardiology, respectively. This second phase of specialty selection adds a unique dimension to vocational development, one that prompts additional exploration, decision-making, and choice (Hartung & Leong, 2005).

Yet to date research is less clear about how personality traits influence people's specialization choices after they have entered an occupation. In this paper, we consider this issue and report findings from a study of medical doctors and their choice of specialty. Although considerable research is already available on personality and medical specialty choice, we will use this specific occupational area as a backdrop to demonstrate how new insights in this field of specialty choice research are possible when looking at this issue from a broader perspective, that is, by adopting a conceptual framework that transcends specific occupational fields. In the present study, we propose Holland's (1997) established RIASEC model to differentiate between the characteristics of specialty environments *in general*, and test the empirical relations between Big Five personality traits and selection of medical specialty environments in particular.

Within-occupation Choices and Personality

The paradigm of trait-factor theory (Parsons, 1909), concerned with matching persons to environments based on trait assessments, has generated a wealth of knowledge on between-occupation choices and personality variables. For instance, Judge, Higgins, Thoresen and Barrick

(1999) argued that the personality traits that are associated with individuals' vocational interests, should also predict individuals' gravitation to occupations over time. In a longitudinal study, they showed associations between personality traits in adolescence and later life occupations, classified on the RIASEC occupation environment dimensions.

Much less is known, however, about how personality influences vocational specialty after a person enters a chosen occupation. This is an important gap in our understanding because the pathways that a person may take within a specific occupation vary considerably, with different specialties containing a variety of different job features and activities. Just as personality may affect vocational selection, so traits may affect the selection of career specialties, contributing to decisions about how careers will play out over time. A logical question for research into career behavior is therefore whether personality traits are associated with specialty selection in different ways compared to occupational selection. This question is certainly timely, given that under the influence of rapid technological and scientific developments, growing numbers of students and workers will find themselves confronted with career specialty decisions (Meir & Melamed, 2005). Moreover, prior research already suggests that occupational specialty congruence provides a more appropriate measure and potentially better predictor of vocational satisfaction than does vocational congruence (Meir and Yaari, 1988).

The issue of career specialization further poses important theoretical challenges. Career theories widely assume that occupations retain a high degree of homogeneity, that is, that individuals within occupational groups resemble each other much more than do individuals in different occupational groups (e.g. Kuder, 1977, 1980). Matching persons to occupations, as performed via trait assessment, necessitates a sufficient degree of homogeneity in any given occupational group so as to distinguish it from other occupational groups (Hartung, Borges, & Jones, 2005). For many disciplines today, such as medicine (which will be the context for our

study), this is problematic as specialties can differ so much that they almost constitute distinct occupations (Borges & Savickas, 2002).

The question of personality effects on career specialty selection is addressed in this study by using Holland's RIASEC model of occupational environments as the classification framework to describe the differences between specialties. The RIASEC model is particularly useful in this respect for several reasons. First, prior research has indeed demonstrated that the RIASEC model is an appropriate taxonomy to describe differences between specialties (e.g. in the discipline under study, medicine; Borges, Savickas, & Jones, 2004; Petrides & McManus, (2004). In this respect, it is important to elaborate how RIASEC profiles of specialties might differ from broader occupations. Under a broad occupational classification, it is logical to expect dominant RIASEC environment characteristics (e.g. Investigative in the case of medicine; Borges, Savickas, & Jones, 2004), but also that specialties subsumed under that classification will vary with respect to other RIASEC dimensions (e.g. in medicine, specialties are more or less characterized by Realistic, Artistic, Social, Enterprizing or Conventional dimensions). It is based on this variation that we argue for the potential conceptual suitability of the RIASEC model to differentiate occupational specialties.

Second, the RIASEC model has been developed with the purpose of bringing order into the entire world of work, and projects such as the development of occupational interest profiles for O*NET (Rounds, Smith, & Hubert, 1999) evidence the generic nature of this taxonomy. Adopting this kind of universal model for specialty description will eventually allow us to replicate inter-specialty differences across occupations. Third and finally, the RIASEC model is particularly appropriate to study trait differences between specialties in light of the previously demonstrated associations between the Five-Factor Model of personality and RIASEC vocational interests (Barrick, Mount, & Gupta, 2003; Larson, Rottinghaus, & Borgen, 2002). Theoretically,

these interests can be seen as the mediating factors in the longitudinal pathway between personality traits and occupational selection (see Woods & Hampson, 2010). The mechanisms by which personality influences occupational specialty choice can potentially be understood through the lens of gravitation and person-environment fit. The process of gravitation to occupations involves individual's personality traits pushing them towards certain occupations through the development of interests and certain job skills and competencies (Wille & De Fruyt, 2014; Woods & Hampson, 2010). An example is the association of Openness with gravitation to Investigative or Artistic occupations.

An effect of the gravitation process is increased homogeneity of traits in within-occupation populations. In the person-environment fit literature (e.g. Lauver & Kristof-Brown, 2001; Kristoff, 1996), this homogenization of people within occupations is described in Schneider's Attraction-Selection-Attrition model (Schneider, 1987). This model describes how perceptions of fit between the person and a prospective environment lead them to select into that environment. If the environment is a misfit, the individual is more likely to leave in the long term (i.e. attrition). Following this logic in the case of selection into RIASEC occupational environments, it would be reasonable to expect for example, that in Investigative occupation populations, there is a higher mean level and narrower spread of Openness scores compared with the general population.

Moreover, if "Investigative" is the dominant RIASEC dimension for an occupation, it is also likely that specialties within the occupation would also be generally high on Investigative. Specialization as a psychologist provides a good example. Psychology occupations tend to all be highly Investigative, despite variation across applied specialties (e.g. clinical, industrial, or educational). The common core of "psychology" results in relative stability of the "Investigative-ness" of psychology specialties.

Collectively, this reasoning leads to our first proposition. *Personality traits that lead to gravitation to specific occupations are not associated with specialty choice within those occupations. This is because of the homogeneity of specific traits of the job incumbents within those occupations, and the homogeneity of within-occupation specialty environments on corresponding job activity dimensions (i.e. RIASEC dimensions).*

Next, it is necessary to consider the variability of specialties within an occupation, and the dimensions on which they might vary. The extent to which traits would be associated with specialty choice logically depends on the nature and extent of specialty differentiation. If job activities within specialties are conceptually consistent with personality traits, then the gravitation process is likely to lead people with specific traits to select specialties that are consistent with those traits and associated interests and competencies. Extending the example of psychologists, one could further hypothesize variation in a number of job activities across specialties. There could be tasks that involve caring for and working with individual clients (e.g. in clinical psychology), with corresponding specialties scoring high on the Social dimension. Alternatively psychologists specializing in industrial psychology typically work in more Enterprising (i.e. business-orientated) environments. Associations of Agreeableness and Extraversion respectively with the Social and Enterprising dimensions may lead people higher on those dimensions to correspondingly gravitate to, or select these specialties. Our second proposition is therefore: *personality traits are associated with specialty choice when traits are conceptually related to job activity variation across specialties. For example, Conscientiousness would be associated with specialty choice if there exist within-occupation specialties that vary in such a way as to appeal to people who are higher or lower on Conscientiousness.*

The Big Five and specialty choice. Applying these general principles, it is possible to propose the potential relations of the Big Five and specialty choice framed within the RIASEC

model. Three of the Big Five (Extraversion, Conscientiousness and Openness) are most consistently linked with gravitation to RIASEC occupational environments, and the mechanisms are described in detail elsewhere (e.g. Hansen & Dik, 2005; Betz, Borgen & Harmon, 2006; Woods & Hampson, 2010; Lent, Brown & Hackett, 1994). In the social cognitive theory of career development (Lent et al., 1994), career choices stem from beliefs held by people about their potential for success in a particular occupation (i.e. self-efficacy). Self-efficacy in turn is influenced by previous experience of activities, including success and failure in those activities. In a similar vein, Woods and Hampson (2010) argue that traits lead children to experiment with particular activities, and as a consequence, develop certain skills and competencies that are reinforced and nurtured by caregivers, setting them on a pathway to later life occupations. This developmental mechanism explains why traits are associated with gravitation to vocational environments (e.g. Judge et al., 1999). These same mechanisms are likely to explain associations of traits and specialties contingent on our propositions above. The potential influences of the remaining two dimensions (Neuroticism and Agreeableness) are less clearly understood.

Neuroticism and occupation specialty. Neuroticism has attracted much research attention in the organizational behavior literature, in part because it has been identified as a predictor of overall work performance (Barrick & Mount, 1991), and also because of its association with negative affect and emotion (e.g. Rusting & Larsen, 1998), and core self-evaluations (e.g. Judge, Locke, & Durham, 1997). Reflecting the association of Neuroticism with core self-evaluation, and consequently with an avoidant approach to work (Ferris et al., 2011), people high on Neuroticism may be more likely to expect failure in work tasks, and to blame themselves if they experience failure. We propose that in evaluating preferences for job tasks, people high on Neuroticism therefore tend to dwell on the consequences of failure and avoid activities, or job specialties where the consequences of failure are especially acute, and where the responsibility

for failure is more readily associated with the individual. In the context of social cognitive theories of career development (Lent et al., 1999), over time, those higher on Neuroticism are likely to have lower self-efficacy for such tasks.

Although the RIASEC model does not capture these aspects of jobs specifically, two dimensions are potentially likely to be relevant dependent on the job context. The first is the Realistic dimension, which broadly involves people working with their hands to perform some physical intervention. In such environments, errors are more easily attributable to the individual performing the intervention. The second is the Enterprising dimension, which involves people working responsibly and autonomously, and often in high-evaluation, target-driven environments (e.g. sales, management and leadership). In certain job contexts, people high on Neuroticism may avoid these two sets of job features (i.e. Realistic and Enterprising characteristics).

Agreeableness and occupation specialty. Agreeableness in the Big Five model comprises facets and traits such as Trust, Altruism, Sympathy, Compassion, Straight-forwardness, and Compliance (Costa & McCrae, 1992). It has been associated with various aspects of social behavior and motives that lead to such behavior. For example, in the context of examining personality in management and entrepreneurship, Zhao and Seibert (2006) proposed that need for affiliation could be considered a motivational process associated with Agreeableness in the Big Five model. Graziano and Eisenberg (1997) reported associations between Agreeableness and prosocial behavior.

The prosocial and affiliative motivational tendencies associated with Agreeableness could potentially push people towards specialties with greater interpersonal relationship building, and opportunity for helping others. In the RIASEC model, such specialty environments are likely to have higher Social scores.

Medical Specialities and the RIASEC Model

In the present study we examine the influence of personality traits on career specialty selection using data from a medical context. This career context is interesting from the point of view of examining career specialty because of the multiple and highly diverse career paths open to doctors as they progress through their training and careers.

Some studies have attempted to classify medical specialities using the RIASEC model, both to identify the ways in which the specialities differ, and to integrate research into medical speciality choice with general literature on vocational choices. Borges, Savikas and Jones (2004) proposed that all medical specialities would be considered Investigative and that person-oriented specialities and technique-oriented specialities might respectively be associated with Social and Realistic dimensions.

Petrides and McManus (2004) also identified Surgery as an example of a more Realistic medical speciality, as surgeons work with their hands and tools, needing high levels of technical proficiency, craftsmanship and practical skills, and their work has immediate consequences. Internal medicine was highlighted as a more Investigative speciality, as physicians investigate patients' symptoms and relate them to latent causes to make a diagnosis. They suggested an example of a more Artistic speciality is Psychiatry, as psychiatrists have to interpret the problems or ideas that a patient expresses using a range of psycho-social theories and respond imaginatively while focussing on the uniqueness of each individual. Public Health was identified as an example of a more Social medical speciality, as Public Health applies medicine to society as a whole, rather than an individual patient, by analysing data to manage social and community health. They highlighted Administrative Medicine as a more Enterprising speciality, as the management of health care and hospitals requires the same skills as management in business, particularly those relating to influencing others, both the patients and medical staff. Laboratory Medicine was suggested as an example of a more Conventional speciality, as

pathologists and other Laboratory Medicine specialists have to develop, implement and follow procedures within a complex system, and they tend to focus on data and technological instruments.

Medical Speciality Choice and Personality

Recently, studies have attempted to provide a clearer understanding of why junior doctors and medical students make specific medical speciality decisions by examining the role of individual differences (Borges & Savickas, 2014; Duffy, Borges & Hartung, 2009). Personality is one of the most widely considered individual differences in these studies (e.g., Borges & Gibson, 2005; Borges & Osmon, 2001; Taber, Hartung & Borges, 2011), although few studies have examined the Big Five model directly. Borges and Savickas (2002) conducted a literature review collating previous research into the role of personality in medical speciality choice using the Big Five as an overarching model, reporting no conclusive pattern of findings.

Typically in this line of research, medical specialty personality profiles have been investigated by adopting a classification scheme differentiating between person- and technique-oriented specialties. Using these categories, Borges and Gibson (2005) for instance found that doctors in person-oriented specialities had higher levels of Agreeableness and lower levels of Neuroticism than those in technique-oriented specialities.

The absence of clear findings about the associations of personality and medical specialty choice (e.g. Borges and Savickas, 2002) highlight the need for further research. In our study, following Petrides and McManus, (2004), we use the more discriminating RIASEC model to describe medical specialties. Moreover, following the recommendation by Borges and Savickas, (2002) we used a personality instrument that directly measures the Big Five personality factors.

The Present Study

The present study tests a theory of specialty selection and its association with the personality traits, by examining specialties in a medical context. We report findings from a sample of UK Medical Students (i.e. junior doctors), and examine the associations of the participants' Big Five personality dimensions with their selected specialties profiled on the RIASEC model.

Our hypotheses were guided by our theoretical propositions. We noted two features of the medical occupation specialties included in our study. First, medical occupations are mostly Investigative and so high Openness is likely to lead to gravitation to medicine (e.g. Woods & Hampson, 2010). As a consequence, doctors are likely to be relatively homogenous on Openness compared to other personality traits, and there is likely to be lower variation on Investigative scores of specialties. We did not expect Openness to predict occupational specialty choice. Second, we noted that generally, the occupation specialties had low scores and low variance on Conventional. The Conventional dimension is typically associated with Conscientiousness, and the absence of specialty differentiation on this RIASEC dimension is likely to mean that Conscientiousness is likewise not associated with specialty choice in our study.

We tested two hypotheses that follow from our theoretical propositions. We propose that medical students higher in Agreeableness and Extraversion will be drawn more strongly to specialties that classified as more Social on the RIASEC dimensions. We predict:

H1: Levels of Agreeableness and Extraversion in junior doctors will be positively associated with the Social RIASEC dimension of their selected medical specialty.

We further propose that medical students higher on Neuroticism are likely to avoid specialties that have potentially threatening consequences of failure. These are typically those that involve physical intervention with patients (such as Surgery or Anaesthesiology), and which are therefore classified as more Realistic in the RIASEC model. Following our earlier reasoning

that Enterprising roles typically involve greater individual responsibility, Enterprising specialties may be less appealing to those higher on Neuroticism. We hypothesize that:

H2:   Neuroticism in junior doctors will be negatively associated with the Realistic and

Enterprising dimensions of their selected medical specialty.

Method

Participants and Procedure

Participants were 199 junior doctors working for the UK NHS in the Yorkshire and Humber region (64% female, 36% male; mean age = 31). In terms of career progression, all of the participants were in the six years of postgraduate speciality training following foundation training. Data were collected electronically. Participants voluntarily completed an online questionnaire, which contained demographic questions, including medical speciality choice, followed by a measure of the Big Five personality traits. Participants also completed other survey items not reported here. A link to the questionnaire was circulated via email to doctors in the Yorkshire and Humber region of the UK NHS as part of a scheme designed to improve doctors' self-awareness. Those who completed the questionnaire were given a feedback report based on their responses to help develop their self-awareness.

Measures

Personality. Following the recommendation by Borges and Savickas, (2002), personality was measured in this study using the 240-item NEO Personality Inventory (Revised; NEO PI-R; Costa & McCrae, 1992). The NEO PI-R is a widely-used measure of the Big Five personality traits, and the five domain scales demonstrated acceptable reliability in this study; Neuroticism (α=.92), Extraversion (α=.89), Openness (α=.89), Agreeableness (α=.87) and Conscientiousness (α=.91).

Medical Speciality. Participants stated their chosen medical speciality as part of the online questionnaire. Each speciality was then assigned RIASEC scores following procedures described by Woods and Hampson (2010) using the O*NET database (O*NET Resource Center, 2003), a publicly available online resource containing detailed information for all US occupations. Specifically, this procedure involves the following steps. Each medical speciality was entered as a search term into the O*NET database. Searches typically returned several O*NET records and each record provides a list of alternative job titles for the same job. When an exact match was retrieved by the search (including in the list of alternative job titles), that record was then selected and used to represent the occupation. Where no exact match was found, the most relevant alternative record was selected. Where no suitable alternatives were found, the specialities were not included in the analyses. Each record supplied ratings indicating the extent to which RIASEC job environments categorised that occupation. As stated earlier, these ratings were established by subject experts, with prior research extensively demonstrating their validity (Eggerth, Bowles, Tunick, & Andrew, 2005; Rounds, Smith, Hubert, Lewis, & Rivkin, 1999; Wille, Tracey, Feys, & De Fruyt, 2014), and suitability for applied research on the RIASEC model (e.g. Deng, Armstrong, & Rounds, 2007).

For the avoidance of confusion, note that RIASEC ratings in the O*NET database are not based on interests or preferences of people in listed occupations. Rather they are independent ratings of the extent to which an occupation is characterized by the RIASEC occupational environment dimensions. Data contained in each record therefore provided six scores for each medical speciality, one for each RIASEC dimension, ranging from 0=highly uncharacteristic of this job, to 100=highly characteristic of this job.

Table 1 contains a list of the medical specialities in our sample, the corresponding O*NET job description title, and the RIASEC scores for the specialities. We earlier proposed

that personality traits are associated with specialty choice when traits are conceptually related to

job activity variation across specialties. To qualify our hypotheses, we therefore computed means

and standard deviations for each of the RIASEC dimensions across the specialties featured in our

sample. These data show that in the range of medical specialties represented in our sample, the

dimensions Realistic, Social and Enterprising, which feature in our hypotheses, have relatively

higher standard deviations (and thus more cross-specialty variation) than Conventional, Artistic

and Investigative (See Table 1)[1].

Results

Correlation and regression analyses were conducted to examine the association of the

doctors' Big Five personality scores with the RIASEC characteristics of their chosen specialities.

Table 2 presents correlations between all the variables in the study and shows that Neuroticism

and Agreeableness were the key traits associated with the specialty RIASEC dimensions.

Extraversion was negatively associated with the Conventional dimension, and consistent with

our theoretical assumptions, neither Openness nor Conscientiousness were associated with any of

the RIASEC dimension scores of specialties. The standard deviations of the Big Five showed

that whilst variances within our sample for each factor were quite similar, slightly lower

variation was observed for Agreeableness and Openness.

To test our hypotheses, the Big Five traits were regressed onto each RIASEC dimension

(see Table 3). Although our hypotheses focused specifically on the effects of Agreeableness,

Extraversion and Neuroticism it is common to include all of the Big Five traits in regression

analyses as controls and for completeness.

The regression findings in Table 3 show that doctors' Agreeableness was associated with

more Social elements in their specialties, but that Extraversion was not. Hypothesis 1 was

therefore partially supported. Junior doctors' Agreeableness was also associated with less pronounced Artistic and Conventional occupational features in their specialties.

Doctors' Neuroticism was negatively associated with the Realistic and Enterprising dimensions of their specialties, supporting Hypothesis 2. Rather unexpectedly, a positive association between participants' Neuroticism and the Artistic dimension of their specialties was also observed. None of the other Big Five traits were shown to predict any of the RIASEC dimensions in medical specialties. This again supports our general proposition, that junior doctors' Openness and Conscientiousness would not be associated with medical occupation specialty.

Discussion

The central objective of the current study was to broaden our understanding of how different traits might shape people's careers once they have selected an occupation. We specifically examined the associations of people's Big Five personality scores with the characteristics of their chosen specialties using data from a medical sample. We proposed that Agreeableness, Extraversion and Neuroticism would be the main associates of specialty choice, and that these would be associated with specific RIASEC dimensions in the profiles of the various specialties performed by the sample of doctors in our study.

Our analyses partially supported our first hypothesis (that junior doctors' Agreeableness and Extraversion would be associated with the Social dimension of their specialties). Doctors with elevated scores on Agreeableness indeed selected specialties with more pronounced Social features. Our analyses also supported our second hypothesis (that junior doctors' Neuroticism would be negatively associated with the Realistic and Enterprising dimensions of their specialties). Doctors with elevated scores on Neuroticism were indeed less likely to have selected specialties with pronounced Realistic and Enterprising features. Moreover, more Neurotic

doctors also had a greater chance of selecting specialties with more Artistic features. These findings have important implications for theory around career choice and practice in vocational psychology.

Theoretical and Research Implications

Our findings suggest a different pattern of personality correlates for occupational specialty choice compared to vocational interests generally. The theoretically-driven associations that were observed in this study between personality traits and the RIASEC dimensions of the medical specialties, suggest that predictable relations between traits and specialty choice may be modelled and understood, if specialty characteristics are conceptualized and operationalized effectively.

The RIASEC scores for junior doctors' selected specialties were predicted mainly by Neuroticism and Agreeableness. In respect of the specific mechanisms underneath these trait influences, it is useful to consider the particular foci of the present study, combining the medical setting of the research, the application of the RIASEC model to characterize specialties, and the Big Five correlates of those specialty environments. The variation in the nature of the tasks within each specialty lead to meaningful variance in the RIASEC profiles of the specialties, and represent a more discriminating means of differentiating specialties than has been used previously (e.g. Petrides and McManus, 2004).

Although RIASEC and other occupational environment profiles of occupations are usually taken on face value in terms of their implications (i.e. a high Realistic score implies Realistic types of tasks), the application of the model to medical specialties also results in less overt characteristics associated with environment characteristics. Medical specialties with high Realistic scores in our sample were Surgeon and Cardiologist. Surgeon scores highly because it is an intervention specialty in which the doctor is required to use their hands principally to

perform invasive treatments. Cardiology is not invasive, but again involves hands-on activities connected to diagnosis and treatment of heart conditions, among the most serious potential illnesses. Although these specialties are similar in respect of requiring motor-use of doctors' hands, there is also an additional similarity, which is the high potential consequences of mistakes or failure. In the operating theatre, or in respect of misdiagnosis of a heart murmur, the consequences of "getting it wrong" are potentially life-versus-death, and attributable to immediate decisions made by the individual doctor. It is this feature that we propose underlies the association of Neuroticism with Realistic scores of medical specialties. Similar features may also explain associations of low Neuroticism with the high Enterprising specialties (e.g. Obstetrics, Cardiology).

We observed a non-hypothesized positive association of doctors' Neuroticism with the level of Artistic elements in their specialties. Our proposed explanation above may also account for this observation. Medical specialties with higher scores on the Artistic dimension involve more room for considering different decision options and interpretations (e.g. psychiatry, microbiology), and are likely to seem less immediately threatening, and therefore to appeal more strongly to those higher on Neuroticism.

Our findings around Neuroticism therefore have potentially generalizable implications. In our sample, this trait was associated with the Realistic, Artistic, and Enterprising dimensions of specialties from the RIASEC model. Similar associations may be observed in other occupation groups, but according to our reasoning, this would be dependent on the extent to which RIASEC or other occupational profile scores represented variance in the inherent threat or risk of failure associated with those occupation specialties. We suggested that this would be most likely for Realistic and Enterprising dimensions.

Our findings supported our hypothesis that doctors who were higher on Agreeableness would tend to work in more Social specialties. This finding reflects directly the characteristics of Social medical specialties (e.g. public health, GP). Specialties with high Social scores involve either greater relational contact and interaction with people, or greater emphasis on altruistic helping (e.g. public health). These characteristics would logically appeal to the motivational aspects of Agreeableness that we propose in our theorizing; respectively affiliation striving and prosocial tendencies. Moreover, these mechanisms would also explain in part the negative association of doctors' Agreeableness with the Conventional RIASEC dimension, because medical specialties with high Conventional scores include less direct interaction with people (histopathology, microbiology cardiology). These are potentially important mechanisms by which Agreeableness influences doctor's specialty choice, although we acknowledge that mediator tests would be needed to fully examine these proposed pathways.

Extraversion did not predict the Social dimension of medical specialty contrary to expectations. It could be that in the medical context, the Social occupation specialties lean more towards the caring aspect rather than social interaction aspect of the dimension. It seems sensible that the kinds of medical specialties that require contact with people are quite different from other kinds of Social jobs (e.g. teaching), which involve giving presentations and interacting in a more gregarious way. For doctors, the Social nature of the role is possibly more related to helping and caring. This could explain why Agreeableness was associated the Social scores of specialties and Extraversion was not. To support this reasoning, as a post-hoc test, we examined the correlations of the six NEO PI-R facets of Extraversion with the Social dimension of specialties. Only facet E5 (Positive Emotions) demonstrated a significant association ($r = .15$, $p < .05$). Woods and Anderson (in press) showed that facet E5 on the NEO PI-R has its primary loading on Extraversion and secondary loading on Agreeableness (being classified in their

'Periodic Table of Personality' in the facet sector 'Affiliation'). This aspect of Extraversion, blending in traits related to Agreeableness reinforces our findings around the associations of doctors' Agreeableness and the Social dimension.

The main implication of our findings is that the influences of particular personality traits on vocational behavior change at different stages of people's careers. The traits that are associated with occupational interest and choice may be different from those that guide specialty selection within occupations. The pattern of results here, compared with previous research on personality and occupational gravitation make two contributions to theory. Firstly, we identify conditions that might determine how and when personality traits are related to specialty selection. Our propositions suggest that traits are related to specialty selection when they are not associated with a dominant occupation environment characteristic, and when there is conceptually relevant within-occupation specialty variation (i.e. when specialties vary in ways that are likely to appeal differently to people with specific personality traits).

Our findings are consistent with theories and models of trait and vocational development. For example, theories of trait development (e.g. the corresponsive mechanism, Roberts, Caspi, & Moffitt, 2003; Buss' model of selection, evocation and manipulation, Buss, 1987) have described processes by which traits lead people to select certain environments, which in turn reciprocally develop those traits. The Dynamic Developmental Model of Woods, Lievens, De Fruyt and Wille (2013) contextualized these mechanisms against career development, suggesting that different career stages (e.g. occupational and specialty selection) could differentially activate personality traits, leading specific traits to be more or less salient at different stages of working life. Applying these mechanisms to our findings, we argue that the selection of a speciality as a context, activates different traits to the selection of an occupation.

We investigated this using medicine as the focal occupation, and have argued for the suitability of the RIASEC model because of the multi-dimensional framework it provides. Future research might examine whether traits relate in a similar manner to variation in RIASEC profiles among specialties in different disciplines, and further investigate the merits of the RIASEC model for this purpose, compared with other work environment taxonomies.

Our second contribution is to open up understanding of how Neuroticism and Agreeableness are associated with vocational behavior. These are two dimensions of the Big Five that are not typically associated with vocational interests and behavior, yet our findings implicate them clearly in decisions about occupation specialty selection.

Practice Implications

Our findings have some implications for career counselling, vocational guidance and occupation profiling. Firstly, there are implications for people involved in guiding and helping people to make career decisions. Conventional ways of looking at person-vocation fit have tended to view fit at the level of occupation (i.e. by matching vocational interests with environment characteristics). For example, our findings suggest that within-occupation specialties should also feature in career guidance discussions and interventions, specifically examining opportunity for affiliation and prosocial helping in respect of Agreeableness, but also in terms of experienced pressure and features of "critical work incidents" to enable people to decide whether occupational specialties are available that appeal to their individual differences.

Our findings and propositions in respect of Neuroticism also have potentially wider implications for occupational profiling. We propose that certain affective features of medical specialties make them more or less appealing to people depending on their level of Neuroticism. Adding this to the increasing research interest and evidence around the role of affect and emotion at work, it may be important to develop a more thorough appraisal of the emotional and affective

characteristics of occupation and specialty environments, perhaps adding these to established

occupation profile analyses such as those captured in the O*NET database. The caveat is that

future research should examine directly the ways in which occupation specialties are

differentiated on characteristics related to threat or consequences of failure. Our study used the

Realistic dimension as an effective and reasonable proxy for medical specialties. Future studies

could examine affective and emotional features more explicitly.

Limitations and Strengths

There are several limitations to note in our study. Firstly, our data reflect specialties

already selected by the junior doctors within the first six years of specialty training. There are a

number of potential influences on choice of specialty beyond individual differences (e.g.

geographical location, availability of first choice). These represent constraints on decisions

which might moderate the influence of personality traits on choices, which are not controlled in

our analyses. Future studies could examine these aspects of decision autonomy.

A second limitation is that we do not test explicitly the mediation pathways from

personality to specialty selection. Our study is the first to propose that the personality dimensions

influencing vocational preferences may be different from those influencing specialty choice, and

our data test the associations of traits and specialty directly. Our study represents a solid first test

of these associations, adopting a similar approach to Woods and Hampson (2010). However, our

theoretical arguments about why the associations exist should be further elaborated by capturing

the mediating motivational variables that we include in our reasoning (e.g. approach/avoidance

motivation in the case of Neuroticism, and need for affiliation and prosocial tendency in the case

of Agreeableness).

In contrast to these limitations, our study also has several strengths. Ours is the first study

to examine personality and occupational specialty through the lens of the RIASEC model,

contributing to literatures on personality and vocational development, and medical specialty specifically. Secondly, the data reported in this study help to clarify associations of the Big Five with occupational specialty, therefore adding to understanding of how these traits are associated with vocational behavior and development beyond occupational choice. Finally, the observed associations in this study were underpinned by theoretical propositions. These were developed such that they may be applied to other occupational settings, thereby laying foundation for future studies, and ultimately a generalizable theory of personality and occupational specialty.

ENDNOTES

1. Note that although almost 45% of the sample were in the General Practice (GP) specialty category, this is importantly representative of the medical profession on the UK. For example, data reported by the General Medical Council of the UK in 2010 indicated that 47% of UK doctors were registered GPs (Bruce, Haward, Hutchison, McGrath, Hopper, Perkins & Poole, 2011).

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Table 1

RIASEC scores for all medical specialities in the sample

Medical Speciality	O*NET description	N	R	I	A	S	E	C
Acute medicine; Emergency medicine	Emergency medical technicians and paramedics	8	56	61	6	89	50	28
Anaesthetics	Anaesthesiologists	8	67	72	17	67	28	28
Cardiac surgery; Ear, nose and throat; Core surgical training; General surgery; Trauma and orthopaedics	Surgeons	14	78	89	22	67	33	28
Cardiology	Cardiovascular technologists and technicians	2	72	72	6	72	22	45
Core medical training; General adult; Geriatrics; Nephrology	Internists, general	18	56	95	17	72	45	28
Core psychiatric training; Psychiatry	Psychiatrists	37	17	100	56	78	17	28
Dermatology	Dermatologists	1	56	100	22	83	17	11
GP	Family and general practitioners	88	50	95	17	83	28	28
Histopathology	Pathologists	2	56	95	11	33	0	39
Microbiology	Microbiologists	1	61	100	6	11	17	33
Obstetrics and gynaecology	Obstetricians and gynaecologists	4	67	100	17	83	45	17
Ophthalmology	Ophthalmologists	5	67	100	17	72	22	33
Paediatrics	Paediatricians, General	8	39	100	28	83	22	28
Public health	Preventative medicine physicians	3	56	89	28	95	22	11
Mean			57	91	19	71	26	28
Standard Deviation			15.09	12.89	12.82	22.53	13.41	9.43

Table 2

Means, standard deviations and correlations of all variables in study

	1	2	3	4	5	6	7	8	9	10	11
1. Realistic	-										
2. Investigative	-.84**	-									
3. Artistic	-.48**	.47**	-								
4. Social	-.24**	-.01	.00	-							
5. Enterprising	.58**	.49**	-.62**	.15*	-						
6. Conventional	.01	-.10	-.09	-.43**	-.19**	-					
7. Neuroticism	-.26**	.16*	.21**	-.07	-.21**	.08	-				
8. Extraversion	.11	-.03	-.05	.13	.09	-.19**	-.41**	-			
9. Openness	-.04	.05	.07	.13	-.05	-.14	-.02	.42**	-		
10. Agreeableness	.13	-.01	-.18*	.22**	.14*	-.18*	-.19**	.19**	.25**	-	
11. Conscientiousness	.11	-.12	-.08	.12	.08	.03	-.45**	.23**	-.09	.03	-
Mean	48.09	93.37	24.57	78.48	28.14	27.87	89.50	113.26	118.85	126.06	121.30
Standard Deviation	17.21	9.00	15.57	9.11	9.40	3.63	23.73	19.24	18.27	16.59	19.42

Note. N=199, *p<0.05, **p<0.01Table 3

Table 3.

Regression analyses for Big Five personality traits on RIASEC dimensions

	Realistic		Investigative		Artistic		Social		Enterprising		Conventional	
	b	*t*	*b*	*t*	*b*	*t*	*b*	*t*	*b*	*t*	*b*	*t*
Neuroticism	-.23	-2.70**	.15	1.72	.19	2.21*	.05	0.56	-.19	-2.19*	.01	0.17
Extraversion	.04	0.47	.03	0.36	.00	0.03	.06	0.64	.04	0.50	-.17	-1.94
Openness to Experience	-.09	-1.09	.04	0.43	.12	1.52	.07	0.92	-.11	-1.31	-.02	-0.29
Agreeableness	.10	1.35	.01	0.11	-.18	-2.45*	.20	2.68**	.13	1.72	-.14	-1.97*
Conscientiousness	-.01	-0.15	-.06	-0.75	.02	0.25	.13	1.67	-.03	-0.37	.08	0.98
R		0.28		0.18		0.28		0.27		0.25		0.25
R^2		0.08		0.03		0.08		0.07		0.06		0.07
Adjusted R^2		0.05		0.01		0.06		0.05		0.04		0.04
F		3.28**		1.28		3.29**		3.01*		2.65*		2.67**

Note. b-coefficients are standardized regression coefficients *p<0.05, **p<0.01