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Predicting Adult Occupational Environments from Gender and Childhood Personality Traits

Stephen A. Woods and

Aston Business School, Aston University, Birmingham, UK

Sarah E. Hampson

Oregon Research Institute, Eugene, Oregon, USA

Abstract

To test aspects of a theory of the role of personality and gender on the development of vocational interests, and their subsequent effects on adult occupational choices, this study examined associations between childhood personality traits, gender, and occupational environments over 40 years later. Participants ($N = 587$) were assessed on the Big Five by their teachers when aged 6–12 years. In middle-age (late 40's) they reported their occupation. Holland's RIASEC vocational types (Realistic, Investigative, Artistic, Social, Enterprising, Conventional) were used to characterize the job environments of reported occupations. Childhood Openness/Intellect and Conscientiousness, but no other Big Five traits, were associated with occupational environments. For the most strongly sex-typed work environments, associations with Openness/Intellect were moderated by gender. Discussion of these findings suggested that the roots of the strongest gender stereotyping effects in occupations may be found not only in the social factors associated with gender, but also in the individual differences of children related to Openness/Intellect.

Keywords

Occupations; Gender; Big Five; Vocational Interests; Personality; Openness/Intellect

Why, despite enormous social change over the past 50 years, do men and women continue to be interested in, and gravitate to, different kinds of occupational environments? In this paper we argue and demonstrate that the answer to this question, in part, relies on examining how gender and childhood personality traits interact to influence later life occupational choices. We develop a theoretical model of vocational development, the pathways of which suggest that alongside gender, individual differences in childhood are significant influences on the course of people's lives that eventually lead to them to gravitate to different careers and occupations. To test aspects of our theory, we examined the associations between childhood personality traits, gender, and the characteristics of adult occupational environments more than 40 years later. The study was conducted with participants in the Hawaii Personality and Health Cohort. This is a prospective study that began in the 1950's and 1960's when teachers assessed the personality traits of entire classrooms of elementary school children in Hawaii. From 1998 to

Address for Correspondence: Stephen A. Woods, Ph.D., Aston Business School, Aston University, Aston Triangle, Birmingham, B4 7ET, Tel: + 44 121 204 3101, S.A.Woods@aston.ac.uk.

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the present, participants (now middle-aged) have been located and recruited for follow-up studies (Goldberg, 2001; Hampson et al., 2001; Hampson et al., 2006; Hampson et al., 2007; Kanazawa et al., 2007). These data offered a unique insight into early predictors of adult occupational choices.

Vocational Environments and Interests

The most widely used and researched model of vocational environments and interests is Holland's Vocational Type theory (Holland, 1958, 1992, 1996, 1997). Holland's person-environment fit theory of occupational choice proposes that people gravitate to, or select work environments that match their vocational interests, and that employee satisfaction and performance is maximised when an individual's work environment is congruent with their interests. Vocational choices arise from perceptions of fit between work environment and interests. In Holland's model, six vocational types characterise both occupational environments and individual differences in vocational interests and dispositions (Holland, 1997). Realistic (R) individuals prefer tangible or physical activities involving machines, tools, or animals; they tend to be practical, conforming, and unsightful. Typical R jobs include building construction and auto mechanics. Investigative (I) individuals prefer activities that involve thinking, analysis, and organizing; they are intellectual, curious, and rational. They work in fields such as medicine and science. Artistic (A) people prefer creative or self-expressive work, and are original, nonconforming, and impulsive. They are found in a range of jobs related to the creative arts. Social (S) people enjoy working with and helping others; they are patient, understanding, and responsible. Their work environments include education and nursing. Enterprising (E) individuals prefer work that involves influencing others and attaining positions of status, they are self-confident, domineering, and energetic. Typical E job include sales and management. Conventional (C) people enjoy working systematically with data, filing records, and other rule-regulated activities; they are orderly, efficient, and unimaginative. Typical C jobs include librarians and bank tellers. In the Dictionary of Occupational Titles (U.S. Department of Labor, 1991) and more recently in the O*NET database (O*NET Resource Center, 2003), jobs are categorized according to Holland's six vocational types, and rated on continuous scales representing the degree to which they are characterized by each of the six types.

Empirical examinations of Holland's theory have examined the structural properties of the six RIASEC interest types, showing that they form a quasi-circumplex or hexagon in the order R-I-A-S-E-C (Armstrong, Hubert, & Rounds, 2003; Darcy & Tracy, 2007; Tracey & Rounds, 1993). This structure (see Figure 1) is found from late adolescence onwards and, although the distances between dimensions vary in different samples, the basic circumplex structure is invariant across gender and ethnicity (Armstrong et al., 2003; Darcy & Tracey, 2007), including among Native Hawaiians (Oliver & Waehler, 2005). Each type is conceptually most similar to its adjacent types, and least similar to its opposing type (e.g., the Investigative type is similar to the Artistic type, and least similar to the Enterprising type).

The proposition that people gravitate to occupations that match their interests has been examined in a number of studies. A validation study for the Strong Interest Inventory found that RIASEC types predicted occupational group membership 12 years later (Hansen & Dik, 2005), and similar prospective results were reported by Donnay and Borgen (1996) and Betz, Borgen, and Harmon (2006), who also found that personality traits added to the prediction of occupational group membership beyond interest assessments. Recent studies such as these, in addition to an earlier review (Fouad, 1999), support Holland's theory that vocational interests are predictors of people's occupational choices, in adolescence and later in life.

Personality and Vocational Interests

Vocational interests are related to other forms of individual differences, importantly personality traits and cognitive abilities (Ackerman & Heggestad, 1997). The study of the relation between vocational interests and personality traits has been assisted greatly by the emergence of the Big Five model of personality consisting of five broad trait dimensions: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness/Intellect (Goldberg, 1990). Despite critics and alternative models (e.g. Block, 1995; Ashton & Lee, 2005), the Big Five model is widely accepted and used in basic and applied research (John & Srivastava, 1999; McCrae & Costa, 1997).

Numerous studies have examined the associations between the Big Five bipolar dimensions and Holland's six vocational interest types (e.g., De Fruyt & Mervielde 1997). These findings have been consolidated in two meta-analyses (Barrick, Mount, & Gupta, 2003; Larson, Rottinghaus, & Borgen, 2002). Larson et al. (2002) reported the strongest associations for Openness with Artistic, Investigative, and Social, and for Extraversion with Enterprising and Social. Associations were also observed between Agreeableness and Social, Conscientiousness and Conventional and Enterprising, and Neuroticism and Enterprising. In their meta-analysis, Barrick et al. (2003) also identified the strongest associations for Openness with Artistic and Investigative, and for Extraversion with Enterprising and Social, and weaker associations between Agreeableness and Social, and Conscientiousness and Conventional.

Alternative approaches to understanding the intersection of personality and interests have examined their joint hierarchical structure. Mount, Barrick, Scullen, and Rounds (2005) performed a meta-analytic cluster analysis of the Big Five and the Holland six vocational types that revealed two dimensions. The first was characterized primarily by Conscientiousness and Conventional interests versus Openness and Artistic/Investigative interests. The second differentiated Realistic and Investigative interests from Extraversion, Social, and Enterprising interests. Notably, Ackerman and Heggestad (1997) reported identical clustering in their examination of personality, interests, and intelligence.

Collectively, the results of these studies confirm that the Big Five traits are associated with the RIASEC types, and suggest that where a trait is associated with more than one vocational type they are likely to be ones that are adjacent in the circumplex structure (e.g., Openness/Intellect with Investigative and Artistic). In particular, Extraversion, Conscientiousness, and Openness/Intellect are associated with the RIASEC types.

Personality Traits and the Development of Vocational Interests

How does the association between traits and interests come about? According to Holland (e.g., 1992, 1997), vocational interests are an expression of personality traits, and both traits and vocational interests result from the combined influences of heredity and environment on the development of activities, interests, and competencies that become more differentiated with age. Children of elementary school age do not have well-formulated vocational interests (Tracey, 2001), but by late adolescence vocational interests have become more fully developed and relatively stable (Tracey, 2002; Tracey, Robbins, & Hofsess, 2005). Although young children are not able to describe their personalities in Big Five terms, the Big Five factor structure can be derived from parents' and teachers' ratings of elementary school children (e.g., Goldberg, 2001). Personality traits in children this young have been associated with consequential outcomes later in life (Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). Accordingly, childhood personality traits are a potential major influence on the development of vocational interests and hence vocational choices.

The Big Five traits that have been most reliably associated with the RIASEC types in adults are Extraversion, Conscientiousness, and Openness/Intellect. Extraversion is an interpersonal trait related to a person's needs for affiliation and level of dominance. Therefore, a more extraverted child is likely to develop activities, interests, and competencies of a social nature. Conscientiousness and Openness/Intellect are related to successful accomplishment of tasks, which requires hard work, or creativity, or a combination of the two. Children with higher levels of these traits are more likely to do well in school and to develop activities, interests, and competencies associated with educational attainment (Noftle & Robins, 2007). In our theoretical model, our first proposition is therefore that: *Children's personality traits, particularly Extraversion, Conscientiousness, and Openness/Intellect direct them to particular activities and interests and the acquisition of certain competencies that eventually shape their vocational interests, which in turn lead them to work in particular occupational environments.*

It follows from this proposition that childhood personality traits should be associated with adult occupational environments. In the one prospective study of which we are aware to test this hypothesis, Judge, Higgins, Thoresen, and Barrick (1999) categorized participants' job titles according to the RIASEC model, giving each job a dimensional score on the six vocational types. These scores were then correlated with participants' Big Five traits assessed in adolescence (12–18 years), and regressed onto all of the Big Five plus general mental ability. Judge et al. (1999) reported significant negative zero-order associations between Openness and Conventional occupations ($r = -.31$) and Extraversion and Investigative occupations ($r = -.16$), and positive correlations between Conscientiousness and Investigative occupations ($r = .33$) and Neuroticism and Realistic occupations ($r = .18$). In regression analyses, significant standardized betas were observed for Openness with Artistic ($\beta = .21$) and Conventional ($\beta = -.32$) occupations, Extraversion with Realistic ($\beta = -.30$) occupations, and Agreeableness with Investigative ($\beta = -.27$) and Social ($\beta = .26$) occupations. Although the effect sizes were modest, this study demonstrated that all the Big Five traits assessed in adolescence had long-term associations with adult occupational choice.

Gender and the Development of Vocational Interests

Gender is a major influence on the development of vocational interests and eventual career choices (Lent, Brown, & Hackett, 1994). From as young as 2–3 years, boys and girls aspire to careers that are gender stereotypic (Fouad, 2007). Girls express preferences for female-typed jobs (Miller & Budd, 1999) and girls who express preferences for non-traditional jobs are less likely to persist in their choice than those choosing traditional jobs (Farmer et al., 1995; Fouad, 2007). Traditional career choices for men may be related to anti-feminine attitudes and self-perceptions of toughness and emotional restrictiveness (Jome & Tokar, 1998). Men and women also give different gender-stereotypic reasons for entering particular careers. For example, men explain entering engineering based on their interests, whereas women tended to cite altruistic reasons such as helping others (Davey, 2001).

Differences in the vocational interests and choices of men and women can be explained in part by the gender stereotyping of occupations. Studies of the gender-stereotyping of occupations summarized by Gottfredson (1981) suggested that the strongest sex-typing was perceived for Realistic occupations (male) and Conventional occupations (female), Investigative and Enterprising occupations were somewhat masculine, and Artistic and Social occupations were somewhat feminine. Sex-typed ratings of occupations correlated highly with the actual proportion of men and women found in those occupations (Treiman & Terrill, 1975).

A recent meta-analysis by Su, Rounds, and Armstrong (2009) examined gender differences in vocational interests in more than half a million participants, reporting robust differences in the

interests of men and women. Men showed stronger preferences for Realistic and Investigative jobs. Women had stronger preferences for Conventional, Social, and Artistic occupations.

How do gender differences in occupational interests and choices develop and proliferate? Gottfredson (1981) argued for the importance of gender in her Circumscription and Compromise theory of occupational aspiration. She asserted that, through sex-role typing, gender influences the development of vocational aspirations at around age 6–8 years, earlier than any other individual factor, including personality traits. The mechanisms of adjustment to gender roles in occupational choices were explored further by Eccles (1994), and Eccles (Parsons) et al. (1983). In Eccles's (1994) theoretical model, choices about vocations and careers are influenced by perceptions of self-efficacy for a particular occupation, and the subjective value that a person attaches to tasks associated with that occupation. These perceptions are developed through childhood socialization experiences, during which children absorb influences from parents, teachers, and others about gender roles, and the suitability and value of particular occupations. Culture plays an important role in setting the context for socialization influences. Societal norms and associated expectations about the suitability of jobs for men and women therefore influence the development of vocational interests as children and adolescents react to the views, values, and beliefs of the people who guide their development and social upbringing. Our model incorporates these concepts, leading to the second theoretical proposition: *Through the process of socialization and adjustment to the well-defined gender-stereotyping of occupations, boys and girls develop predictably different vocational interests, leading them to work in different occupational environments.*

Personality, Gender, and Occupational Environments

One of the implications of theories of gender and occupational choice is that boys and girls with similar personality traits may develop divergent occupational interests because of socialization influences (Eccles, 1994). In our model, we propose that children will develop job interests consistent with their traits. However, to the extent that occupational environments are gender-stereotyped, we also propose that children will experience socialization pressures to develop personality-based job interests along gender-stereotyped lines. This may result in boys and girls with similar traits eventually gravitating to different occupational environments.

The introduction of gender-based stereotyping of occupations raises the possibility of a second mechanism by which traits may influence occupational environments: there may be some aspects of personality that promote the tendency for a child to be more or less influenced by gender-based stereotyping. One trait in particular in the Big Five model, Openness/Intellect, may exert such an influence. Openness/Intellect is a broad dimension that encompasses traits of imagination, intellectual curiosity, and openness to new ideas and experiences. We propose that children who are more imaginative, intellectually curious, and thus open to new ideas will be more likely to develop vocational interests and aspirations that buck the trend of gender stereotyping. Such traits enable children to project themselves into a wider range of potential adult roles, and hence to develop self-concepts less limited by gender stereotypes (Eccles, 1994). Children who are seen by their parents and teachers as high on these traits are also more likely to be encouraged to aspire to counter-stereotype interests and occupations. In contrast, children who are lacking in the traits associated with Openness/Intellect will be more likely to develop self-concepts that are consistent with gender stereotypes, and more likely to pursue interests that lead them to gender-stereotyped occupations. The cumulative effects of the development of these self-perceptions, combined with (and, in part, resulting from) being perceived in these ways by others, will result in a narrowing of perceived occupational choices along gender-stereotyped lines for those low on these traits.

Therefore, in our model, childhood Openness/Intellect serves a pivotal role in the development of job interests. It leads to particular occupational environments as a result of two influences:

the development of job interests consistent with the features of Openness/Intellect, and the development of job interests relatively free from gender-based stereotyping. None of the other Big Five traits offers the potential for these two kinds of influence on the development of job interests. For this reason, we investigated the influence of childhood Openness/Intellect in greater depth in this study.

A consideration of the combined effects of Openness/Intellect and gender-based stereotyping of occupational environments leads to our third theoretical proposition. *Gender will affect the way that Openness/Intellect influences the development of vocational interests and subsequent occupational choices for children low on this dimension, but not for those high on the dimension. Associations of low childhood Openness/Intellect with adult occupational environments will be different for men and women, whereas association of high Openness/Intellect will be the same for men and women.*

Our full theoretical model is shown in Figure 2. The model highlights the influences of personality traits and gender on the development of vocational interests leading to occupational choices. Gender is shown to moderate the association of Openness/Intellect with vocational interests, as described above. The inclusion of gender moderation of the influence of personality represents an important theoretical development in this area, and an advance on previous longitudinal studies (e.g. Judge et al., 1999) and developmental theories (e.g. Gottfredson, 1981; Eccles, 1994). Although not shown in Figure 2, our model acknowledges that people's choices about occupations are not based solely on job interests. Choices are likely to be constrained by external factors such as financial and family issues, and perceptions of barriers to success in particular occupations that include perceptions of self-efficacy, ability, and external demands. Consequently, people do not necessarily eventually work in occupations that match their interests. Nevertheless, we propose that childhood personality traits and gender are significant early influences on eventual occupational choices that should be apparent in a longitudinal study.

The Present Study

The Hawaii cohort offered an unprecedented opportunity to relate early childhood personality traits, assessed in elementary school (with some children as young as first grade), to adult occupational environments assessed by the RIASEC dimensions over 40 years later. Although these unique data did not include a direct measure of vocational interests, they did permit us to test important aspects of our theoretical model. We examined associations of the Big Five personality traits in childhood with later-life occupations, and gender differences in the occupational environments of men and women. We also tested whether associations between early childhood Openness/Intellect and adult occupational environments were moderated by gender in ways consistent with the propositions of our model. We used Holland's six RIASEC types to characterize the job environments of occupations held by men and women in our sample at midlife, and teacher assessments of their Big Five personality traits collected in elementary school to represent childhood personality.

Hypotheses

We expected to replicate several findings from past research. Given the numerous other psychological and environmental influences on vocational choice operating over a 40-year time span, we did not expect to find highly discriminated associations between particular childhood traits and RIASEC types. However, in light of previous findings, we predicted that Openness/Intellect would be positively associated with Investigative and Artistic, Extraversion would be positively associated with Enterprising, and Conscientiousness would be positively associated with Conventional environments. We also expected to replicate differences in the RIASEC environmental characteristics of occupations held by men and women. Occupations

held by women should be more Conventional, Social, and Artistic, and less Realistic, Enterprising and Investigative than those held by men.

The novel predictions tested in this study were derived from our theoretical model of the development of occupational interests and choices from the combined influence of Openness/Intellect and gender socialisation. Our predictions are therefore focused on those occupational environments that are associated with Openness/Intellect.

For strongly gender-stereotyped environments (i.e., Realistic and Conventional), we made the following predictions for children low on Openness/Intellect. Realistic environments are male stereotyped whereas Conventional environments are female stereotyped. Therefore, because children low on Openness/Intellect were expected to develop job interest along gender-stereotyped lines, we predicted that low childhood Openness/Intellect would lead men to Realistic work environments, and women to Conventional work environments.

For gender-stereotyped environments for which high childhood Openness/Intellect is relevant, we expected that high Openness/Intellect will be predictive for both men and women. Investigative is a male-stereotyped environment that should be predicted by high childhood Openness/Intellect. Men have both the relevant childhood trait and the environment is masculine; women have the relevant childhood trait, and this trait should also enable them to transcend the gender stereotyping of that environment. Therefore, we predicted that both boys and girls high on Openness/Intellect should be likely to develop job interests that lead to Investigative environments. Artistic is a female-stereotyped environment associated with high Openness/Intellect. Therefore, we expected high childhood Openness/Intellect would predict more Artistic environments for both men and women. These predictions may be summarized in the following hypotheses:

Hypothesis 1—Gender will moderate the association of Openness/Intellect with Realistic and Conventional occupational environments: low childhood Openness/Intellect will predict Realistic environments for men but not women, and Conventional environments for women but not men (i.e. Openness/Intellect and Realistic will be negatively associated for men, but not associated for women; Openness/Intellect and Conventional will be negatively associated for women, but not associated for men).

Hypothesis 2—Childhood Openness/Intellect will predict Investigative and Artistic environments for both men and women.

Method

Participants and Procedures

Participants were members of the Hawaii Personality and Health cohort, a community sample composed of individuals who underwent a personality assessment conducted by their elementary school teachers over 40 years ago. Entire classrooms in several schools on the Hawaiian islands of Oahu and Kauai were assessed ($N = 2,404$). Since July 1998 to the present, efforts have been made to locate and recruit these individuals, who now range in age from approximately 45–55 years (see Hampson et al., 2001 for details). To date, 83% of the original sample have been located, and 69% of these ($N = 1,299$) have been recruited to participate in follow-up studies. The present sample was limited to the 587 individuals for whom childhood personality ratings were available and who provided information about their current or most recent occupation(s). The sample reflected the gender ratio of the original childhood cohort with near equal numbers of men ($n = 296$) and women ($n = 291$). The present sample reflected the ethnic diversity of the Hawaiian population with 42% Japanese Americans, 18% European Americans, 17% Native or part Native Hawaiians, 8% Filipino Americans, 6% Chinese

Americans, and 9% of other ethnicities. To evaluate the representativeness of the present participants, their childhood scores on the Big Five personality dimensions were compared with the scores of the other members of the childhood cohort. The present participants differed from the remainder of the childhood cohort by being slightly more conscientious (less than a quarter of a standard deviation), but there were no other differences on the childhood Big Five. As discussed by Hampson et al. (2001), it is to be expected that those members of the cohort who could be located after 40 years and who agreed to participate in follow-up studies would tend to be more conscientiousness.

Measures

The teacher assessments of childhood personality traits were conducted between 1959 and 1967 when the individuals in the present study were in grades 1, 2, 5 or 6. The adult self-reports of occupations were obtained by questionnaire in 2005.

Childhood personality traits—The childhood personality assessments are described in detail by Goldberg (2001). These assessments are among the most meticulous and extensive assessments of children's personality traits ever conducted. In brief, teachers rank-ordered the students in their classrooms on each of 36–63 personality attributes derived from those used by Cattell and Coan (1957), using a fixed nine-step quasi-normal distribution. Definitions for each attribute were developed by focus groups of teachers (e.g., “Persevering: Keeps at his/her work until it is completed; sees a job through despite difficulties, painstaking and thorough”). Goldberg (2001) demonstrated that these assessments yield the five-factor structure. The Big Five factors and their defining attributes were as follows: Extraversion (gregarious, energetic vs. seclusive, lethargic), Agreeableness (self-minimising vs. spiteful, rude, self-centered), Conscientiousness (persevering, planful, careful vs. irresponsible), Emotional Stability (adaptable vs. fearful, concerned about acceptance), and Openness/Intellect (original, imaginative, curious, esthetically sensitive). The childhood scores on these five dimensions were in the form of factor scores (i.e., with a mean of zero and standard deviation of 1).

Current or previous occupation—Participants were presented with a list of occupation categories, each illustrated with a number of specific example occupations (e.g., Artist [painter, musician, interior designer]; see Table 1). Participants were asked “If you are employed (or self-employed), how would you describe your job? If you are retired, what did you do before you retired?” Most participants (354) checked one category, 156 checked two, and 77 checked three.

Assignment of RIASEC Scores to Occupations—Each occupation category on the survey was assigned RIASEC scores using the O*NET database (O*NET Resource Center, 2003). O*NET is the electronic successor to the Dictionary of Occupational Titles (US Department of Labor, 1991), containing detailed information for all US occupations. The O*NET database is a public access resource available on the Internet, where users can retrieve occupational information by entering occupations as search terms. Searches typically return several O*NET records for individual occupations, which the search-engine rank-orders according to their relevance. Often, different job titles may be used interchangeably to describe the same occupation (e.g. hairdresser and hairstylist), and so each O*NET record contains a list of potential alternative job titles within each occupational record.

The first step in assigning RIASEC scores to the occupation categories provided on the questionnaire administered to the Hawaii cohort was to match occupations included on the survey to O*NET records. To do this, each occupation was entered as a search term into the O*NET database. Where an exact match was retrieved, the record was used to represent the

occupation. Where no exact match was retrieved, the most relevant alternative record was selected. In all but a few cases, the highest ranked record retrieved by O*NET included the initial search term in the list of alternative job titles, and was therefore used to represent the occupation. The remaining occupations were matched to multiple records, subsets of which were selected to provide a representative coverage of the occupation. Notable cases are Management (represented by managers from several different job functions), Education ('K through 12' represented by kindergarten, elementary and middle school teachers; 'college and university' represented by secondary and postsecondary teachers from a variety of subjects), Psychologist (represented by clinical, counseling and school psychologists), Engineer (represented by aerospace, chemical, civil, materials and mechanical engineers), and Drafts Person (represented by mechanical, civil, electronics and architectural drafts person).¹ Occupations and matched O*NET records are described in full in the Appendix.

As a result of this procedure, occupational categories on the survey was represented by a corresponding set of O*NET records. Among the information reported in O*NET records are ratings that indicate the extent to which RIASEC job environments characterize different occupations (six scores – one for each RIASEC dimension - ranging from 1 = highly uncharacteristic of this job, to 7 = highly characteristic of this job). For example, jobs such as Fine Artist, Musician, and Interior Designer all have high ratings on the Artistic (A) dimension, but low ratings on the Conventional (C) dimension. This means that the work activities associated with these jobs typify Artistic job environments, but are unrepresentative of Conventional job environments. The validity of the ratings was established by Rounds, Smith, Hubert, Lewis, & Rivkin, (1999) and more recently by Eggerth, Bowles, Tunick and Andrew (2005), and have been used in past structural studies of Holland's RIASEC model (Deng, Armstrong, & Rounds, 2007).

For each occupational category on the survey, RIASEC ratings from corresponding O*NET records were averaged to give a set of RIASEC scores (see Table 1). If a participant checked more than one occupational category on the questionnaire, the average score on each RIASEC type across the checked occupations was used to create their RIASEC profile.

Results

Associations Between Childhood Personality Traits and Adult RIASEC Types

The zero-order correlation matrix for all the study variables is shown in Table 2. It is immediately apparent that the significant correlations were confined to two traits: Openness/Intellect and Conscientiousness. Openness/Intellect was associated positively with Artistic and Investigative, and negatively with Conventional. Conscientiousness was associated positively with Conventional, and associations were also observed between Conscientiousness and Realistic, Investigative, Artistic, Social and Enterprising. Contrary to our expectation, no association was observed between Extraversion and Enterprising.

Gender Differences on RIASEC Types and Childhood Personality Traits

Table 2 includes all the correlations with gender. Consistent with previous findings women were more likely to work in occupations that were more Artistic, Social, and Conventional and less Realistic. However, contrary to previous findings, women were *more* rather than less likely to work in occupations that were Enterprising, and there was no gender difference on Investigative. Compared to boys, girls were rated as less extraverted, more conscientious, and less emotionally stable. Openness/Intellect did not correlate with gender. The gender differences both in childhood traits and in the likelihood of working in particular adult

¹Military personnel were not included in this study ($n = 8$) because RIASEC ratings are not available for military jobs.

occupational environments demonstrate the importance of examining the effects of gender in these analyses.

Moderator Effects of Gender on Associations Between Childhood Openness/Intellect and Adult Occupational Environments

To evaluate our hypotheses that associations between childhood Openness/Intellect and adult occupational environments would be moderated by gender, the Big Five traits and gender were entered as predictors into separate moderated multiple regressions for each of the RIASEC types. In step one of the model, the main effects of gender and all of the Big Five traits were included, and the gender-by-Openness/Intellect interaction was entered at step 2.

The significant interactions were further evaluated using procedures recommended by Cohen, Cohen, West, and Aiken (2003, p.380). That is, the model was re-run with the dummy coding of gender reversed to determine the trait's main effect for the other gender. In the models reported in Table 3, women were coded 0 and men were coded 1 (i.e., the step 2 models in Table 3 show the main effect of Openness/Intellect for women). The beta weights for the main effects for men and women in respect of the interactions of interest are all reported in the text.

The results of the regression analyses are summarised in Table 3. The results represent a range of small-moderate effect sizes (adjusted R^2 values between .02 and .20), which are comparable to the R^2 values ranging from .03 –.17 reported by Judge et al. (1999) in their study relating adolescent personality traits to adult RIASEC occupation types. Tests of moderator effects revealed significant change in explained variance for Realistic, Conventional, and Enterprising.

In our theoretical model, we proposed that associations of Openness/Intellect with occupational environments would be gender stereotyped for people low on this trait. Results of the moderated multiple regressions supported this hypothesis (See Figure 3). Realistic environments are strongly male-typed and men who were less open/intellectual as children had higher Realistic scores as adults ($\beta = -.12, t = -2.43, p < 0.05$). This association was not significant for women ($\beta = .04, t = 0.70, p = 0.48$). Conventional environments are strongly female-typed, and we found that women who were less open/intellectual as children had higher Conventional scores ($\beta = .01, t = 0.27, p = 0.79$), but this association was not significant for men ($\beta = .01, t = 0.27, p = 0.79$). By contrast, high Openness/Intellect was associated with more Artistic and Investigative occupational environments for both men and women (i.e., there were no gender moderation effects). Collectively, these findings confirmed both Hypotheses 1 and 2. The finding for Enterprising was unexpected: men who were more Open/Intellectual as children ($\beta = .16, t = 2.96, p < 0.05$), but not women ($\beta = -.11, t = -1.83, p = 0.07$), had higher Enterprising scores (see Figure 3).

Predictive Accuracy

To examine the accuracy of these regression equations to predict occupational environments, we conducted a classification analysis for the RIASEC types. Participants were classified according to their highest type score on their actual RIASEC profile (averaged across job titles where they checked more than one). We examined the expected (predicted) values derived from the regression models for each RIASEC dimension to determine which was largest for each participant. These categorisations were used to construct 2×2 tables of true positives, true negatives, false positives, and false negatives for each RIASEC type. The Realistic type was the most accurately predicted (114 true positives, 300 true negatives, 153 false positives, and 20 false negatives) yielding a predictive efficiency of .43 (ratio of true positives to true positive plus false positives). Predictive efficiency was .32 for Social, .34 for Enterprising, and .30 for Conventional. Artistic and Investigative had zero efficiency because these types did not have the highest predicted values for any participants.

Discussion

This study tested aspects of a developmental theory of the influences of childhood personality traits and gender on later occupational environments. Our purpose was to explore the mechanisms that continue to lead boys and girls along different vocational pathways, and which as a consequence, perpetuate gender stereotyping of occupations. Drawing on Gottfredson's (1981), Holland's (1997), and Eccles' (1994) theories of vocational development, we proposed a theoretical model of personality, gender, and occupational interests and choices. We proposed that gender and personality traits jointly influence the development of vocational interests, which subsequently lead people to make occupational choices.

According to the first proposition in this model, children develop interests in vocations consistent with their traits. These interests, moderated by constraints on choices and decisions, lead them to select occupations that match their interests. The correlations among the childhood personality traits and the adult RIASEC types provided support for this aspect of our theory. As predicted, Openness/Intellect was related to Investigative and Artistic RIASEC types. As predicted, Conscientiousness was related to the Conventional type but, unexpectedly, it was also associated with the other five RIASEC types. Contrary to expectations, Extraversion did not predict the Enterprising type. The associations of childhood Conscientiousness and Openness/Intellect with all the aspects of vocational environments studied here suggests that these traits influence generalizable skills related to range of vocational characteristics. The significance of childhood Conscientiousness in this study is consistent with past findings in which childhood Conscientiousness has been associated with various important life outcomes including career success (Roberts et al., 2007), although it differs from previous studies relating the Big Five to the RIASEC types (Barrick et al., 2003; Larson et al., 2002; Judge et al., 1999). Our study provides longitudinal evidence that childhood personality traits predict occupational environments later in life, although the mediating pathway of vocational interests remain to be tested.

Why should these effects of personality traits be limited to Conscientiousness and Openness/Intellect? One possible explanation is that these childhood traits were assessed by their teachers. The traits of Conscientiousness and Intellect/Openness are highly relevant to the classroom and teachers would be particularly focused on these aspects of their students' personalities. Therefore, teachers may be better at assessing these traits compared to others of the Big Five. Accurate or not, there are likely to be important academic consequences for children perceived as more conscientious and more open/intellectual affecting their eventual educational attainment and generalizable skills, and hence career opportunities (Rosenthal & Jacobson, 1968). In Judge et al.'s (1999) study, the children were somewhat older (12–18 years) and their Big Five trait assessments were derived from psychologists' Q sorts based on personality information from various sources including self-ratings and parents as well as teachers. Such diverse sources of personality information may explain why Judge et al. (1999) obtained associations with later occupational outcomes for four of the five Big Five in their longitudinal study. It is also possible that interpersonal traits such as Extraversion and Agreeableness do not begin to influence the development of vocational interests until adolescence, as Gottfredson (1981) argued, when social relations and peer influences assume particular importance.

In the second proposition of our theoretical model we proposed that, as a consequence of socialization, development, and learning environments, boys and girls absorb concepts about gender stereotypical job roles, which lead them to develop different job interests and to make different job choices. Consistent with previous findings for gender-stereotyping of occupations (Gottfredson, 1981; Su et al., 2009), Realistic environments were more likely for men, whereas Artistic, Social, and Conventional environments were more likely for women. However, contrary to previous research, Enterprising environments were more (not less) likely for

women, perhaps reflecting a change in this aspect of women's work opportunities since those earlier sex-typing studies. No gender differences in the likelihood of being in Investigative environments were predicted or found, indicating that they were relatively gender-neutral in this sample.

Our main theoretical contribution, and third proposition, was to consider the joint influences of gender and childhood Openness/Intellect on the development of occupational interests and choices. Consistent with the first theoretical proposition, we expected that childhood Openness/Intellect would be related to adult occupational environments for which that trait was relevant. However, we also proposed that children high on Openness/Intellect would be more capable of imagining and conceiving themselves working in occupations that were gender untypical, leading them to develop less stereotypical interests. Being perceived as imaginative and curious by teachers and parents may lead to different socialization experiences whereby children high on Openness/Intellect were encouraged to think more broadly about jobs and careers. This led to specific hypotheses about the occupational environments for which the effects of Openness/Intellect would be moderated by gender.

As predicted, for men, low childhood Openness/Intellect predicted Realistic occupational environments whereas for women this childhood trait predicted Conventional occupational environments. Girls viewed by their teachers as less imaginative and curious were more likely to be working with data, filing records, and doing other rule-regulated work in middle-age. In contrast, boys viewed by their teachers as less imaginative and curious were more likely to be working at physical jobs manipulating tangible objects in middle-age. For both genders, low childhood Openness/Intellect predicted adult occupational environments characterized as 'concrete' rather than 'abstract', but these outcomes diverged along gender-stereotypical lines. For children viewed as high on Openness/Intellect, adult occupations did not differ by gender. More imaginative and curious girls and boys were more likely to work in Investigative and Artistic occupations, indicating that gender-based stereotyping is less likely for occupations consistent with higher Openness/Intellect. However, Artistic occupations were more likely for women than men, independent of their Openness/Intellect, suggesting that there are other gender-based influences that lead women to this work environment.

As expected, no combined influences were found for Social which is stereotypically female but is not related to Openness/Intellect. Unexpectedly, a gender moderation effect was observed for Enterprising. Men who were more Open/Intellectual as children, but not women, had higher Enterprising scores. In past research, Enterprising has been stereotyped as a masculine environment, and has not been related to Openness/Intellect. However, in our sample, women's work environments were more Enterprising than men's. Therefore, the gender moderation effect was consistent with our model. Men with higher childhood Openness/Intellect were able to develop interests in this counter stereotypical work environment. However, this finding may be unique to the Enterprising occupational opportunities available to this cohort in Hawaii in the 1970's and 1980's.

From these findings, we conclude that childhood personality traits and gender influence the development of job interests and eventual occupational choice in ways consistent with our model. None of the gender moderation findings directly contradicted our predictions, although the result for Enterprising was unexpected.

Implications and Reflections on Theory

The theoretical model developed in this article represents several important advances and contributions to theorizing in the area of vocational development. Firstly, our model draws together previously unrelated theories and empirical findings. We reviewed a wealth of evidence of the associations of personality traits and vocational interests, and of vocational

interests and choices. Holland's (1997) theory of vocational interests and choices acknowledges these associations, but does not account for the effects of broad bandwidth personality traits such as those of the Big Five. In our model, we propose that early childhood traits lead people to develop specific preferences for vocational activities and ultimately specific kinds of occupation. This is an advance on Holland's theory, which does not offer clear explication of the developmental mechanisms that affect vocational interests.

Theories of gender, socialization and vocational choices were also reviewed and captured in our model (e.g. Gottfredson, 1981; Eccles, 1994). The relative contributions of nature and nurture on gendered development of vocational interests are not addressed in our model, although it is clear that environmental experiences such as socialization and influence from parents, school teachers, and other important adult figures in children's lives are likely to have a profound effect on the ways that boys and girls perceive themselves in relation to vocational activities and occupations. However, our model also gives agency to children in their development, specifically in relation to their conformity to gender-stereotypical expectations of vocational interests. Our model proposes that the trait Openness/Intellect is a key determinant of not only occupational choices, but also the extent to which the choices that follow from this trait are gender stereotypical. Our analyses confirm this proposition. The implications are that boys and girls high on Openness/Intellect are able to think more openly and creatively about their future vocational identities, resisting conformity to gender stereotypical expectations. This effect may be compounded as parents, teachers, and others pick up on, and nurture these broader interests. The most gender stereotyped of occupations (Realistic and Conventional) are both associated with low childhood Openness/Intellect. Our model explains this by proposing that the lack of imagination and curiosity of children low on this trait appears to influence the development of interests that are 'concrete' rather than 'abstract', and traditional in respect of their conformity to gender stereotypes. Likewise, such conformity may be compounded by the nurturance of adults.

At the start of this report, we posed the question why, despite social change, do men and women continue to be interested in, and gravitate to, different kinds of occupational environments? Our theory, and findings show that the roots of the strongest gender stereotyping effects in occupations may be found not only in the social factors associated with gender, but also in the individual differences of children related to Openness/Intellect.

Predicting Occupational Environments from Childhood Personality and Gender

The effect sizes for the regression models predicting adult work environments from gender and childhood personality were small to medium (R^2 ranged from .02 to .21), which raises the question of the utility of our models in for practical application. The classification analysis, which dichotomized continuous variables thus reducing power, indicated that the chances of correctly classifying individuals into their highest RIASEC type on the basis of their expected RIASEC values derived from the regression equations were relatively low (.30 – .43). However, Holland (1997, p. 110) observed that the predictive efficiency of the Vocational Preference Inventory rarely exceeds 45%. Given the over 40-year follow-up in the present study, which far exceeds any follow-up previously examined in the prediction of vocational environments, these accuracy levels compare well.

Limitations—The focus of our study on early childhood personality traits has distinct strengths, but the absence of vocational interest data means that our study was not a complete test of our theory linking traits, gender, vocational interests and occupational choice. Nevertheless, we are unaware of any available dataset that would permit a similar prospective study to ours, and so the study provides an important foundation to develop further research in this area. Participants reported fewer Investigative and Artistic jobs than jobs characterized

by the other RIASEC dimensions, which may reflect limited job opportunities and other barriers to these types of jobs for our sample, and restricted our ability to relate childhood traits to these types of work environments. It is also interesting to speculate on the extent to which the effects of gender observed here reflect the historical experiences of this particular multiethnic cohort, raised in Hawaii in the 1950's and 1960's. Further studies using data from more recent cohorts could help to resolve this question, as well as addressing the important question of replicability. Race/ethnicity is a factor in occupational choice and the sample in this study consisted of predominantly of the three main ethnic/cultural groups that are most numerous in Hawaii (Japanese, Native Hawaiian, and European). The extent to which the present findings generalize to other ethnic/cultural groups remains to be determined.

One methodological issue in particular deserves comment. Where participants checked more than one job an individual's profile of ratings on the RIASEC dimensions was obtained by averaging across these multiple jobs. The effect of this procedure may have resulted in less extreme scores on each dimension (regression to the mean), and restriction of range may have affected the results. Working multiple jobs was common for these participants, and we did not establish which, if any, of their jobs they regarded as primary.

Applied Implications—There are implications of our findings for vocational psychology. The first and most obvious is concerned with the provision of vocational guidance and education to children. Our findings provide evidence that personality traits at ages 6–12 are associated with particular occupational environments over 40 years later. Therefore, our results provide some justification for the introduction of vocational education to children at an early age. Whereas formal vocational guidance may be unsuitable for young children and not justified by our findings, broad social education about work may help to develop a child's awareness of the kinds of work activities that appeal to their individual differences. Activities which allow children to explore and experiment with different kinds of tasks and forms of work may be particularly suitable in this respect, facilitating the development of vocational interests that are consistent with childhood traits. Vocational counsellors and psychologists could draw on our findings to develop programs of such activities in schools.

More importantly perhaps, our findings have implications for guidance of boys and girls as they develop vocational interests. We do not adopt a position in this article about the relative worth of gender stereotyped and non-stereotyped jobs. Many people work in jobs that they would consider stereotypical for their gender, and are highly satisfied, committed, and make important contributions to organizations and societies. However, what is concerning is the possibility of a barrier between children low on Openness/Intellect and occupations that are untypical for their gender, which is presented by a simple tendency to conform and to not explore alternatives and question societal expectations. Our findings suggest that it is children low on Openness/Intellect who should receive the most encouragement and guidance to consider a range of gender typical and untypical occupations.

A final applied implication is for practitioners working within the Big Five and RIASEC frameworks. Our findings for the dimensions of actual occupations confirm some past findings for occupational interests. However in many respects, our findings were different from meta-analyses of occupational interests and personality. These differences are informative and provide additional interpretive depth for practitioners who guide people in their careers. In particular, there appears to be strong evidence now of the alignment of Openness/Intellect and Conscientiousness with interests in and gravitation to particular occupational environments, offering vocational counsellors increased confidence about making recommendations for clients based on assessments of these personality traits.

Conclusions—To test aspects of a developmental theory of personality traits, gender, vocational interests, and adult occupations, prospective associations between childhood personality traits, gender, and occupational environments over 40 years later were examined in this study. Childhood Openness/Intellect and Conscientiousness were the most important personality predictors of adult occupational environments, with gender moderating the influence of Openness/Intellect. Our findings highlight the importance of Openness/Intellect particularly in the development of occupational interests and choices, and suggest that the roots of the most important gender stereotype effects in occupations may delve into not only social factors in gender socialization, but also individual differences in the ability to question and imagine oneself in different occupational roles. For many of us, occupations are one of the defining features of adult life. Our findings suggest that despite the multiple influences on this important adult outcome, some of its origins can be traced back to early childhood individual differences.

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Appendix: Assignment of Job Titles on the Questionnaire and O*NET Records to Job Categories

Listed below in italics are the job categories as they appeared on the questionnaire with specific examples where provided shown in parentheses, and the O*NET records used to assign RIASEC scores to these job categories.

Artist (Painter; Musician; Interior Designer)

O*NET: Fine Artist; Musician (Instrumental); Interior Designer

Writer (Author; Journalist; Editor)

O*NET: Poet, Lyricist, Creative Writer; Reporters and Correspondents; Editor

Customer Service

O*NET: Customer Service Representatives

Entrepreneur/Small Business Owner/Self-employed

O*NET: Chief Executives

Financial (Accountant; Stockbroker; Loan Officer)

O*NET: Accountant; Sales Agent, Securities and Commodities (Stockbroker); Loan Officer

Legal (Lawyer; Paralegal)

O*NET: Lawyer; Paralegal and Legal Assistants

Management

O*NET: Human Resource manager; First Line Manager (Retail sales); First Line Manager (Non-retail Sales); First Line Manager (Personal Services)

Sales (Insurance Agent; Realtor; Retail)

O*NET: Insurance Sales Agents; Real Estate Agents; Retail Sales Persons

Public Safety (Police; Fire Fighter; Security Guard)

O*NET: Police (Patrol) Officer; Fire Fighter (Municipal); Security Guard

Sports (Athlete; Coach; Fitness Trainer)

O*NET: Athletes and Sports Competitors; Coaches and Scouts; Fitness Trainers and Aerobics

Instructors

Education (K through 12)

O*NET: Kindergarten Teacher (except Special Needs); Elementary Teacher (except Special Needs); Middle Teacher (except Special Needs)

Education (college and university)

O*NET: Secondary Teacher (except Special Needs); Postsecondary Teacher (Health Specialities); Postsecondary Teacher (Physics); Postsecondary Teacher (Engineering); Postsecondary Teacher (Psychology)

Medicine (Doctor; Dentist)

O*NET: Doctor (Family and GP); Dentist

Other Medical (Nurse; Hygienist; Lab Tech)

O*NET: Registered Nurse; Hygienist (Dental); Medical and Clinical Laboratory Technicians

Mental Health (Psychologist, Social Worker)

O*NET: Counselling Psychologist; Clinical Psychologist; School Psychologist; Social Worker (Mental Health and Substance Abuse)

Religious (Clergy; Missionary)

O*NET: Clergy

Clerical (Secretary; Word Processor; Data-entry)

O*NET: Secretary (except legal; medical; executive); Word Processor, Typist; Data Entry

Keyers

Record Keeping (Bookkeeper; Medical Records)

O*NET: Bookkeeping, Accounting, Auditing Clerks; Medical Records and Health Information Technician

Manual Laborer (Construction; Machine Operator)

O*NET: Construction Laborer; Multiple Machine Tool Setters, Operators and Tenders: Metal and Plastic

Personal Services (Waiter; Hairdresser)

O*NET: Waiter and Waitress; Hairdresser, Hairstylist, Cosmetologist

Skilled Tradesperson (Mechanic; Plumber)

O*NET: Automotive Master Mechanic; Plumber

Transportation (Truck Driver; Shipping)

O*NET: Truck Driver (Heavy and Tractor Trailer); Truck Driver (Light or Delivery Services)

Computer Technology (Programmer; Analyst)

O*NET: Programmer; Analyst (Computer Systems)

Engineering (Engineer; Drafts Person; Surveyor)

O*NET: Aerospace Engineer; Mechanical Engineer; Civil Engineer; Chemical Engineer; Materials Engineer; Civil Drafter; Mechanical Drafter; Electronic Drafter; Architectural Drafter;

Surveyor

Scientist (Geologist; Sociologist; Biologist)

O*NET: Geoscientist (except Hydrologist and Geographer); Sociologist; Biologist

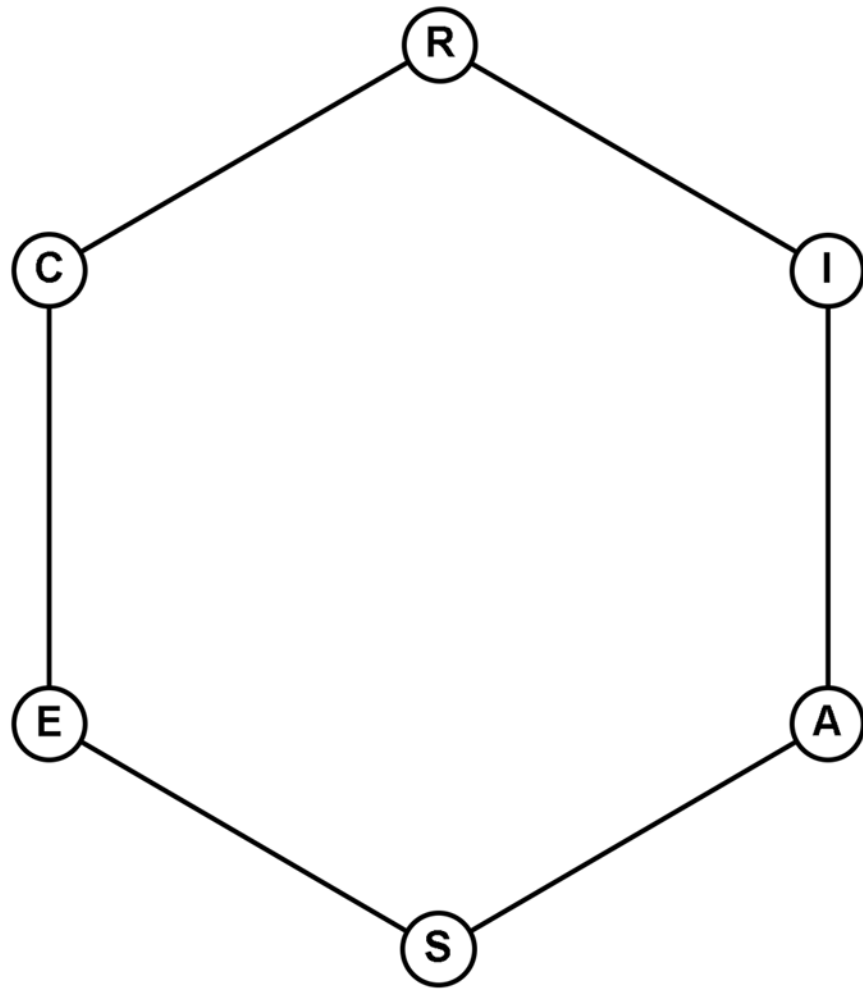


Figure 1. The Holland RIASEC model (R = Realistic, I = Investigative, A = Artistic, S = Social, E = Enterprising, C = Conventional).

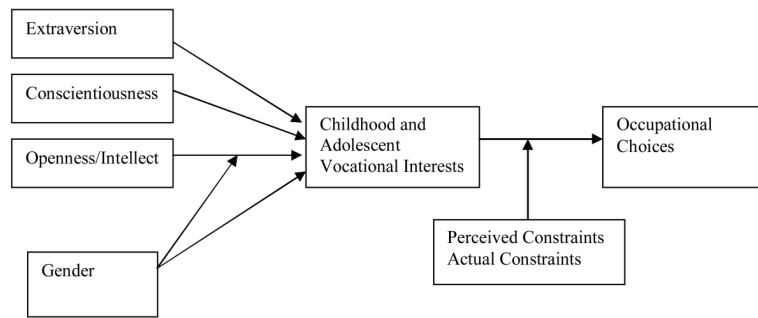
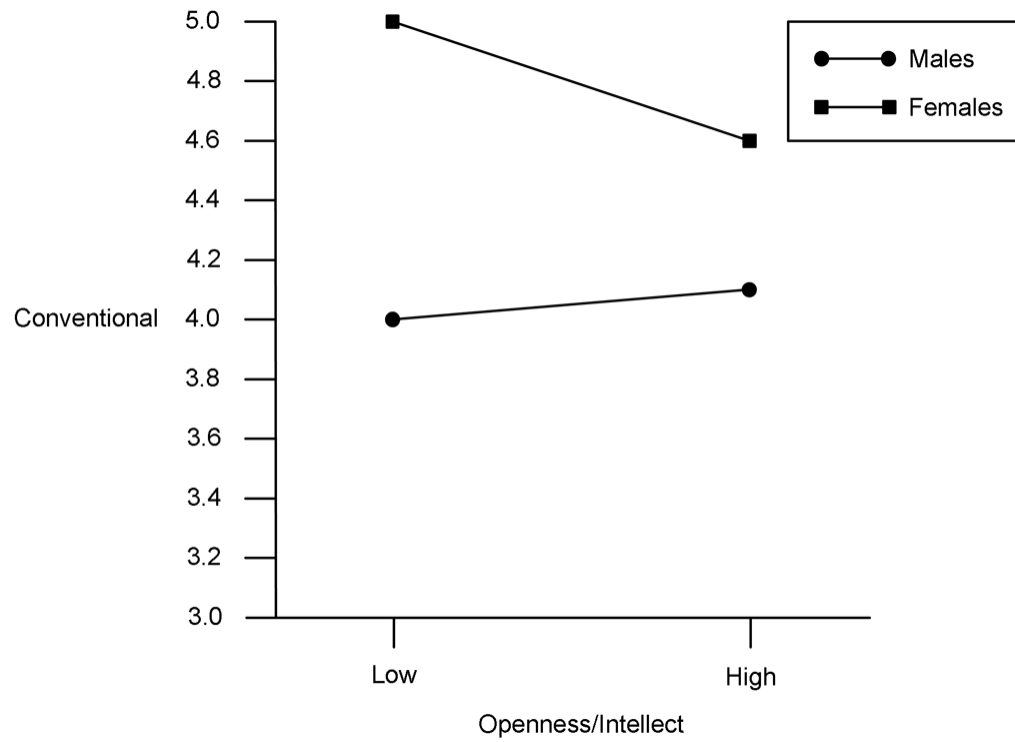
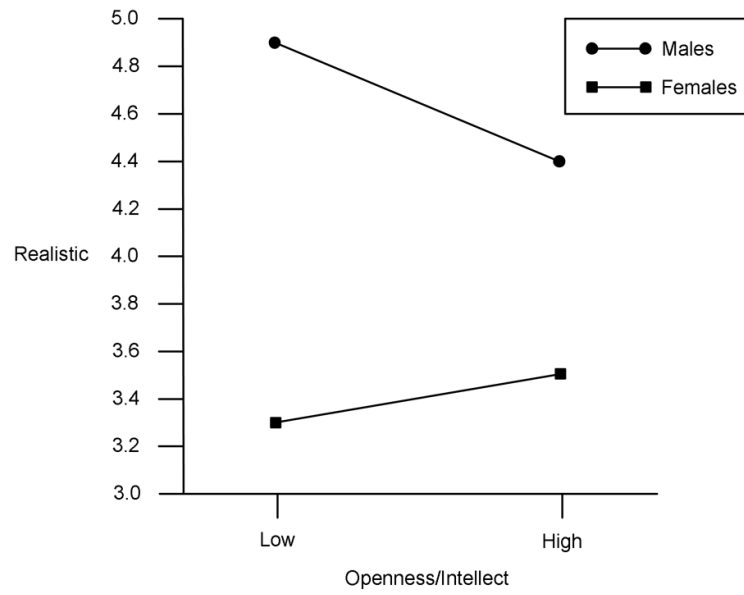


Figure 2. The combined influence of childhood personality traits and gender on the development of job interests and occupations.



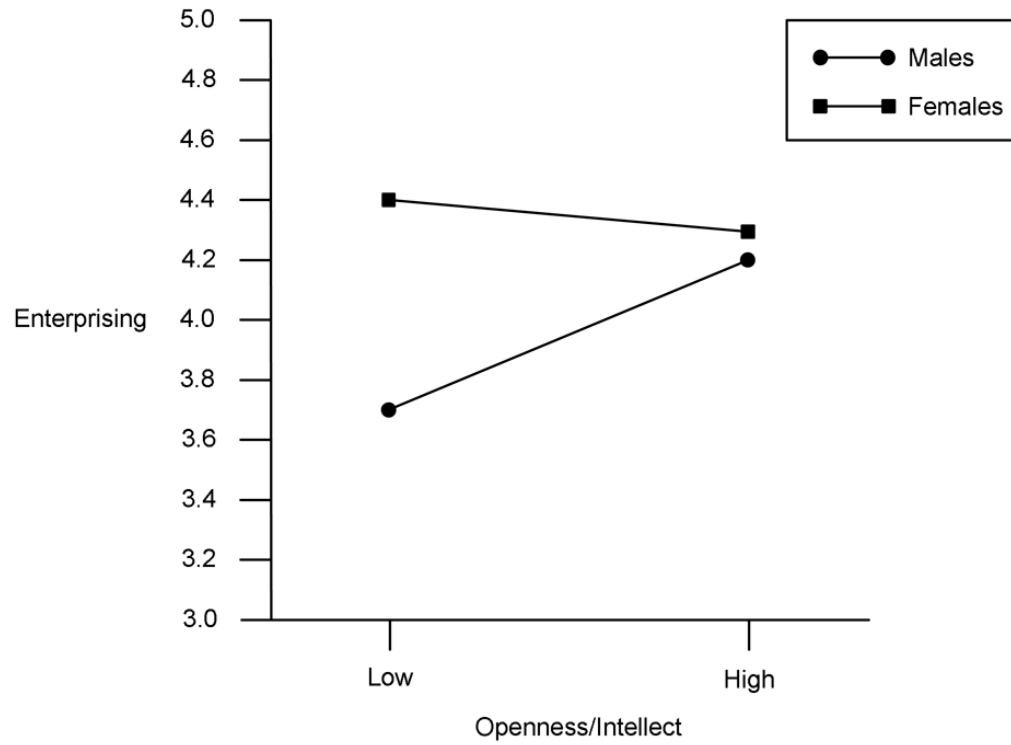


Figure 3. Interactions between gender and Openness/Intellect predicting Realistic (panel a), Conventional (panel b) and Enterprising (panel c) environments.

Table 1

RIASEC Ratings for all Job Categories

Job Title	R	I	A	S	E	C
Artist	4.22	3.26	6.56	3.60	4.18	2.70
Writer	2.12	4.16	6.32	3.72	3.94	3.10
Customer Service	2.50	2.80	2.02	4.48	4.84	6.16
Entrepreneur/Small Business	2.32	3.16	2.32	4.66	6.82	5.68
Owner/Self-employed						
Financial	2.44	3.22	2.10	4.00	5.98	5.56
Legal	2.50	3.82	3.31	4.00	5.98	4.69
Management	2.76	2.85	3.01	4.44	6.40	4.84
Sales	3.20	2.32	2.46	4.90	6.54	4.24
Public Safety	5.10	2.66	2.02	5.22	4.34	3.66
Sports	5.02	2.34	2.76	4.66	5.44	3.00
Education (K through 12)	2.98	4.34	4.68	7.00	2.88	3.76
Education (college and university)	3.65	5.52	3.74	5.73	2.92	3.12
Medicine	4.84	7.00	3.34	4.66	4.15	3.49
Other Medical	4.46	4.44	3.00	5.10	3.32	4.22
Mental Health	2.17	5.85	4.33	5.91	2.83	3.09
Religious	2.32	2.98	4.36	7.00	4.36	3.34
Clerical	3.78	2.12	1.88	2.78	3.34	6.64
Record Keeping	3.34	2.98	2.17	2.65	3.31	6.64
Manual Laborer	6.64	2.02	1.66	1.66	2.17	3.25
Personal Services	3.67	2.02	3.67	5.32	5.50	3.49
Skilled Tradesperson	6.64	2.83	1.66	1.66	2.98	3.16
Transportation	6.64	1.66	1.66	1.66	2.74	3.31
Computer Technology	4.66	5.83	2.32	2.02	2.83	4.69
Engineering	6.06	5.23	3.14	2.37	2.93	4.19
Scientist	4.34	6.08	3.56	2.80	2.44	3.66

Note: R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional (1 = highly uncharacteristic of this job, to 7 = highly characteristic of this job). (Source: O*NET Database; Rounds, Smith, Hubert, Lewis, & Rivkin, 1999).

Table 2

Correlations Among All Study Variables (N = 587)

	Extr	Agre	Cons	Emot	Open	Real	Inve	Arti	Soci	Ente	Conv
Gender	.14**	-.07	-.29**	.09*	.02	.43**	-.05	-.24**	-.36**	-.13**	-.32**
Extr		-.09*	-.05	.08	.05	.01	-.03	-.05	-.02	.02	.00
Agre			-.06	.01	-.02	-.03	-.05	.05	.03	.05	.01
Cons				-.01	-.04	-.22**	.11**	.11**	.17**	.09*	.17**
Emot					.03	.02	-.04	.02	.02	.02	-.04
Open						-.04	.12**	.12**	.07	.04	-.09*
Real							-.20**	-.42**	-.71**	-.68**	-.60**
Inve								.54**	.41**	-.16**	-.23**
Arti									.66**	.03	-.31**
Soci										.34**	.05
Ente											.47**

Note. Extr = Extraversion, Agre = Agreeableness, Cons = Conscientiousness, Emot = Emotional Stability, Open = Openness/Intellect, Real = Realistic, Inve = Investigative, Arti = Artistic, Soci = Sociable, Ente = Enterprising, Conv = Conventional. Gender is coded 1 = male, 0 = female.

* $p < .05$,

** $p < .01$

Table 3
 Childhood Trait Predictors of Adult RIASEC Occupational Environments Moderated by Gender

Predictor	Realistic		Investigative		Artistic		Social		Enterprising		Conventional	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Gender	.41*	-.01	-.01	-.22*	-.24*	-.35*	-.35*	-.12*	-.13*	-.30*	-.31*	
Extraversion	-.05	-.03	-.03	-.02	-.02	.02	-.02	.04	.05	.05	.05	
Agreeableness	-.01	-.05	-.05	.03	.04	.01	.01	.05	.05	.00	.00	
Conscientiousness	-.10*	.10*	.10	.05	.05	.07	.07	.06	.06	.08*	.08*	
Emotional Stability	-.01	-.04	-.04	.03	.03	.05	.05	.02	.02	-.02	-.03	
Openness/Intellect	-.05	.13*	.17*	.12*	.15*	.07	.02	.04	-.11	-.08*	-.19*	
Gender X Openness/Intellect		-.12*	-.06	-.04	-.04	.07		.20*		.15*		
F	24.41*	21.71*	3.21*	2.89*	6.95*	16.10*	14.02*	2.76*	4.00*	13.08*	12.33*	
Overall R2	.20	.21	.03	.03	.08	.14	.14	.03	.05	.12	.13	
Adjusted R2	.19	.20	.02	.02	.07	.13	.13	.02	.03	.11	.12	
Change in R2	.01	.01	.00	.00	.00	.00	.00	.02	.02	.01	.01	
F change	4.60*		1.00	0.55	1.45			11.20*		7.03*		

* $p < 0.05$