

RELATIONSHIP BETWEEN PERSONALITY TRAITS AND VOCATIONAL CHOICE^{1, 2}

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Summary.—The relationship between occupational preferences and personality traits was examined. A randomly chosen sample of 735 students (age range = 17 to 23 years; 50.5% male) in their last year of high school participated in this study. Participants completed Cattell's Sixteen Personality Factor–5 Questionnaire (16PF–5 Questionnaire) and the Kuder–C Professional Tendencies Questionnaire. Initial hierarchical cluster analysis categorized the participants into two groups by Kuder–C vocational factors: one showed a predilection for scientific or technological careers and the other a bias toward the humanities and social sciences. Based on these groupings, differences in 16PF–5 personality traits were analyzed and differences associated with three first-order personality traits (warmth, dominance, and sensitivity), three second-order factors (extraversion, control, and independence), and some areas of professional interest (mechanical, arithmetical, artistic, persuasive, and welfare) were identified. The data indicated that there was congruency between personality profiles and vocational interests.

Various authors have noted an apparent connection between personality traits and vocational choice (Holland, 1966; Agada, 1984; Krug, 1984; Blau & Duncan, 1987; Costa, 1996; Tokar, Fisher, & Subich, 1998; Martínez-Vicente, Valls, & Álvarez, 2003; Peng & Johanson, 2006). One possible source of this is maintenance of traditions within vocations that were thought to improve the fit between an individual and their work using clinical psychology and psychometric approaches. According to Furnham, Petrides, Tsaousis, Pappas, and Garrod (2005), such studies aimed to predict success and adjustment in a job based on scores obtained on several tests, including personality questionnaires.

The process of development and acceptance of an appropriate image of oneself and of one's role in the working world has been called professional orientation (Komarraju & Karau, 2005). This process centers on discovery and clarification of the individual's concept of self, better self-understanding, and self-acceptance. Such concepts appear to begin relatively early in adolescence. For example, in a study carried out with 221 high school students, Chiu (1990) concluded that there was a correlation between students' self-esteem and career aims.

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Super (1984, 1992) conducted studies related to developmental career assessment, the relationships between career maturity and commitment to work, and sex and socioeconomic status. His results facilitated new theoretical connections between personality and career aims. Among these are Holland's typography theory (1997), Roe's necessities theory (1984), and Blau and Robins's integral theory (1990). All these theories have assumed that there is a connection between personality traits and vocational choice.

Holland (1966) described vocational choice as an expression of the personality of the individual and of its stability; this depends on the consistency, differentiation, and congruence between personality type and chosen occupation. Holland used questionnaires about interests and personality as tools for investigating the process of vocational orientation and investigated patterns of certain personality traits presented by all individuals who were members of the same occupational group. He defined a personality structure based on six types that interact in six different professional environments. The personality and the environment have similar descriptors: realistic, investigative, social, conventional, enterprising, and artistic. The personality types that emerge from this model represent personal choices or lifestyles that appear in different environments, organized hierarchically into levels (Alvarez, 1999).

Super (1992) developed a chronological pattern of the consolidation of professional interests similar to that of Holland. In his career pattern study, he described a series of stages of personality trait development that have the greatest effect on vocational choice and career maturity. These stages are related to self-concept (growth stage), self-knowledge (exploration stage), and self-stabilization (establishment stage). Super's model assumes that although people differ in aptitude, interests, and personality, occupations require a pattern of characteristics and there are a variety of occupations for each individual and a variety of individuals in each occupation. As a result, vocational preferences, competences, and the situations in which people live and work (and therefore their concept of self) change the experience acquired, despite that the concept of self is relatively stable from the last stage of adolescence through advanced maturity. Choice and adaptation are assumed to be dynamic processes.

The process of vocational development consists of developing and establishing a concept of self (Chiu, 1990). Vocational development results from interactions between natural aptitudes, carrying out various tasks, and the type and amount of reward obtained from superiors and colleagues (Carbonero & Merino, 2004). According to this model, job satisfaction and satisfaction in life depend on the extent to which people find career paths appropriate to their aptitudes, interests, personality traits, and values. Job and life satisfaction require affirmation in a type of work,

a working environment, and a lifestyle in which the individual can undertake the type of tasks that their experiences have led them to believe are pleasant and appropriate (Tokar, *et al.*, 1998; Peng & Hem, 2000).

The Spanish high school system offers five different types of study: Social Sciences, Humanities, Science/Technology, Health Science, and Arts. A mixed high school course of study is also available, picking courses from two or more options. Many students choose the mixed option and, in effect, the education system promotes a model based on two different general areas: Science/Technology and Humanities/Social Sciences. First year high school students can apply for one specific area, and that option is very important, because students therefore orientate their university study into one of two areas: Science/Technology or Humanities/Social Sciences. In the current study, the question was whether personality traits and vocational interests would be related to choice of university major. According to works by Furnham (2001), Furnham, Petrides, Jackson, and Cotter (2002), and Furnham, *et al.*, (2005), and given the variety of tasks that are undertaken within a given job, it would be expected that subjects presenting the same or similar work interests would present common personality traits.

METHOD

Participants

Participants were selected by stratified random sampling from students in their last year of high school in Cadiz province, Spain, during the 2004 academic year. The province was divided into four geographical areas, and then high schools were randomly selected, as were a sample of 735 students, 371 males (50.5%) and 364 females (49.5%). The age range was from 17 to 20 years (M age = 18.0; SD = 1.3). Three hundred fifty-one were 17 yr. old (47%), 225 were 18 (30.6), 66 were 19 (9.0%), and 53 were 20 (7.2%).

Measures

Vocational factors.—The Kuder–C questionnaire was used to assess the professional interests of the participants (Kuder, 1982). This questionnaire assesses professional interests using 10 different occupational fields: Outdoor, Mechanical, Arithmetical, Scientific, Persuasive, Artistic, Literary, Musical, Welfare, and Administrative (Kuder–C reliability was .90 using Cronbach coefficient alpha). The purpose of this questionnaire is to help students analyze occupations, choose a career, and orientate their training and vocational activities to achieve greater present and future satisfaction. Its specific uses are to highlight those vocations that involve activities similar to their preferences and to assess whether the respondent's tendency toward an occupation is consistent with the type of tasks they ordinarily prefer to undertake.

Personality.—Personality characteristics were measured by Cattell's Sixteen Personality Factor-5 Questionnaire (16 PF-5 Questionnaire; Cattell, Cattell, & Cattell, 1993; Russell & Karol, 1994) that evaluates personality factors using a bipolar response scale: (A) warmth, reserved versus warm; (B) reasoning, concrete versus abstract; (C) emotional stability, reactive versus emotionally stable; (E) dominance, deferential versus dominant; (F) liveliness, serious versus lively; (G) rule-consciousness, expedient versus rule-conscious; (H) social boldness, shy versus socially bold; (I) sensitivity, utilitarian versus sensitive; (L) vigilance, trusting versus vigilant; (M) abstractedness, grounded versus abstracted; (N) privateness, forthright versus private; (O) apprehension, self-assured versus apprehensive; (Q1) openness to change, traditional versus open to change, (Q2) self-reliance, group-oriented versus self-reliant; (Q3) perfectionism, tolerates disorder versus perfectionist; and (Q4) tension, relaxed versus tense. Four other second-order factors were examined: extraversion (EX), anxiety (AX), tough-mindedness (TM), and independence (IN). Cattell's 16 PF-5 reliability was .80 (Cronbach alpha). Although it is possible to obtain other scores (such as leadership, creativity, etc.) as well as a validation index (motivational fluctuation), in this study the 16 first-order and the four second-order factors were used exclusively.

Degree preference.—All participants were asked to identify which topic they would like to study of the 52 different university majors. This variable was named Degree Subject Chosen. Their answers allowed creation of two different groups based on preferences: Science/Technology and Humanities/Social Sciences.

Procedure

Face-to-face individual interviews and the questionnaires, Kuder-C and Cattell's 16 PF-5, were used to collect data during four different sessions. The interviews and questionnaires were administered in the towns and villages where the participants lived. In order to meet the geographical demands of this project, 25 College of Education graduate students assisted in administering the questionnaires and interviews. These graduate students, who were taking a 4.5-credit Professional Orientation course, attended a 6-hr. training session specific to administration of the Kuder-C, Cattell's 16PF-5, and interview procedure.

RESULTS

Sex Differences

Analyses of variance were run to check for sex differences in vocational preferences orientation and personality traits; no statistically significant differences were found. Although some Kuder-C factors showed signifi-

TABLE 1

SEX DIFFERENCES IN ANALYSIS OF VARIANCE FOR KUDER-C AND 16PF-5 QUESTIONNAIRES SCORES

Kuder-C	F	p	16PF-5	F	p
Outdoor	30.10	.001	Warmth	40.44	.001
Mechanical	0.99	ns	Intelligence	28.07	.001
Arithmetical	10.23	.001	Emotional Stability	1.72	ns
Scientific	4.77	.029	Dominance	0.33	ns
Persuasive	1.41	ns	Impulsiveness	0.94	ns
Artistic	0.08	ns	Conformity	1.47	ns
Literary	10.85	.001	Boldness (shy vs bold)	6.12	.014
Musical	0.13	ns	Sensitivity	16.72	.001
Welfare	1.12	ns	Suspiciousness	0.58	ns
Administrative	9.37	.002	Imagination	1.01	ns
			Shrewdness	8.80	.003
			Insecurity	1.63	ns
			Radicalism	0.03	ns
			Self-Sufficiency	27.63	.001
			Self-Discipline	4.75	.030
			Tension	12.70	.001

cant sex differences (Table 1), when the discriminant functions by group (Degree Subject Chosen, dichotomously constructed variable Humanities/Social Sciences and Science/Technology) were defined, they did not show significant differences ($F=1.936$; $p > .01$). Similar results occurred with the 16PF-5 Questionnaire. Sex differences were found, with women scoring higher on Warmth, Shrewdness, and Sensitivity, and men scoring higher on Intelligence, Self-Sufficiency, and Tension. However, those differences were not associated with vocational orientation choice (Pearson $\chi^2=1.262$; $p > .05$). Therefore, sex did not seem to be a significant variable in the relationship between personality traits and general preference for topic of university study (Table 1).

Cluster Analysis of Kuder-C Vocational Factors

The data refer to a total of 52 different study choices, but the Spanish university system offerings can be clustered into two areas: Science/Technology and Humanities/Social Sciences, following the high school model. The 52 degree choices were clustered following the two-type model which allowed calculation of the relations between Degree Subject Chosen and the professional interests described by the Kuder-C vocational factors. A hierarchical cluster analysis was performed on the data with SPSS Version 10, using average linkage between groups. All the possible groups were identified using the Degree Subject Chosen as the grouping criterion: participants were classified into Science/Technology or Humanities/Social Sciences groups according to the self-report of university study preferred. There were 311 participants in the Science/Technology

group and 424 in the Humanities/Social Sciences group. The 10 factors of the Kuder–C were dependent variables. A dendrogram was constructed using the 10 Kuder–C variables, with the aim of determining which Kuder–C factors were related to the Degree Subject Chosen group classification. As shown in Fig. 1, two Vocational Orientations were obtained. The first orientation, defined by the Kuder–C factors Arithmetical, Scientific, Outdoor, Administrative, Mechanical, and Artistic, was more representative of those preferring to study Science/Technology topics. The second included the remaining Kuder–C factors: Persuasive, Musical, Literary, and Welfare, which were more representative of those who preferred studies in Humanities/Social Sciences (Fig. 1).

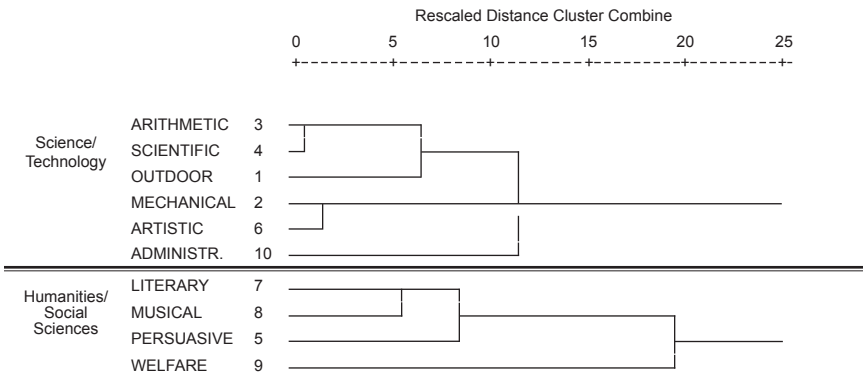


FIG. 1. Dendrogram of the hierarchical cluster analysis. The 10 Kuder–C factors are represented in capital letters. After data comparison, several clusters are generated according to the distance between the different factors (recalculated for integer numbers scale 0 to 25). At Level 25, two clusters are obtained: Science/Technology and Humanities/Social Sciences (Degree Subject Chosen).

Vocational Orientations and Personality Variables

Once the two professional Vocational Orientations had been defined, personality profiles were examined in relation to each of them (Lindley & Borgen, 2000). Discriminant analysis was performed with the two Vocational Orientations as independent variables, and Cattell’s 16PF–5 factors as dependent variables. The analysis differentiated between the two Vocational Orientations relative to the 16PF–5 factors (Wilks $\lambda = .593$; $\chi^2 = 66.30$; $p < .0001$; see Table 2). According to the results, the 16PF–5 variables with the most weight in the canonical discriminant function were Sensitivity (.93), Warmth (.57), Impulsiveness (–.49), and Emotional Stability (–.43). These four variables discriminated between the two Vocational Orientations.

TABLE 2
DISCRIMINANT ANALYSIS FOR CATTELL'S 16PF-5 BY VOCATIONAL ORIENTATION

Function	Eigenvalue	% Variance	Canonical Correlation	Wilks λ	χ^2	<i>p</i>
1	.69	100	.64	.59	66.31	.001
	Correlation 16PF-5 and Discriminant Function			Canonical Standardized Function Coefficient		
Warmth	.54			.57		
Intelligence	.51			-.30		
Emotional Stability	-.31			-.43		
Dominance	-.13			-.06		
Impulsiveness	-.13			-.49		
Conformity	.12			-.06		
Boldness	.12			.36		
Sensitivity	-.11			.93		
Suspiciousness	.06			-.03		
Imagination	.05			-.11		
Shrewdness	-.04			-.08		
Insecurity	.04			-.19		
Radicalism	-.03			-.01		
Self-Sufficiency	.03			-.13		
Self-Discipline	-.02			.15		
Tension	-.02			-.12		

DISCUSSION

Extraversion correlated significantly with the Mechanical, Arithmetical, and Persuasive interests that do not belong to the same group. Interestingly, Extraversion was negatively correlated to Mechanical and Arithmetical, in the Science/Technology group. In addition, a positive correlation exists with the Persuasive factor in the Humanities/Social Sciences group. It is possible that individuals who scored high on the Persuasive factor present higher self-sufficiency and high emotional lability, and these characteristics might lead them to take risks in new situations (Tokar & Swanson, 1995). In the case of participants with interests that were oriented more toward Mechanical and Arithmetical, higher emotional control might be indicated.

The Tough-mindedness trait was negatively correlated with the Artistic factor, suggesting that participants with a more artistic orientation usually present character traits more inclined toward breaking conventionalisms. These individuals tend to be simple, confident, with lower self-control, and do not aim to control or dominate others. Nordvik (1996) obtained similar results with young Norwegians in a study that analyzed university students' choices using the RIASEC model (Holland, 1997). Ward, Cunningham, and Wakefield (1976) verified the strong correlation

between the scales of Cattell's 16 PF-5 Questionnaire and Holland's Inventory of Vocational Preferences.

Finally, it was found that the Independence trait correlates negatively with the Persuasive and Welfare interests. This correlation suggests that participants oriented toward Persuasive and Welfare interests presented higher dependence on others. These individuals tend to be confident, practical, and conservative. These results coincide with Tokar, *et al.*, (1998), and several other studies that reached this same conclusion (Caprara, Barbaranelli, & Borgogni, 1995; Tokar & Swanson, 1995; Nordvik, 1996; Schinka, Dye, & Curtiss, 1997; Hurtz & Donovan, 2000).

Although a series of studies support that theories of personality can be quite valuable in determining vocation choice (Greenberg & Baron, 1995; Holland, 1997; Tokar, *et al.*, 1998), career development and professional choices are influenced by a number of factors, of which personality traits are just one component (Gottfredson, 1999; Hurtz & Donovan, 2000; Lindley & Borgen, 2000; Martínez-Vicente & Valls, 2001). In addition, the most recent research confirms that vocational preferences are influenced by all of the experiences of a given individual as a consequence of their sex, age, race, social status, etc. (Furnham, 2001; Furnham, *et al.*, 2002), that allow the individual to generate self-expectations (Bandura, Caprara, Barbaranelli, & Pastorelli, 2001).

When results are compared to those obtained from workers in Britain and Greece by Furnham, *et al.*, (2005), there was not such a direct relationship between personality traits and the chosen occupational area. However, even if vocational orientation is not completely conditioned by personality traits, the search for a career could be. Furthermore, the main theories of professional career development are being re-examined and grouped under the concepts of career maturity (the ability to make decisions about life in general and about career in particular) and of salience (the value that individuals give to each of the roles they occupy in their lives).

More research is necessary, since it allows educational psychologists and counselors to focus career orientation more effectively, particularly for students in the final year of high school who have not yet decided what degree to take. This is particularly important in Spain where the university system is largely focused on two broad areas (Humanities/Social Sciences and Science/Technology). Two of three young people of an age to start university are unclear about what to study, so there is a need for tools that provide valid and useful information to guide these students. Considering personality traits and their relationship with professional interests as another source of data is a good strategy for making decisions in vocational and professional orientation programs developed in high school settings.

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divided into four geographical areas, and then high schools were randomly selected as were a sample of 735 students, 371 males (50.5%) and 364 females (49.5%). The age range was from 17 to 20 years (M age = 18.0; SD = 1.3). Three hundred fifty-one were 17 years old (47%), 225 were 18 (30.6), 66 were 19 (9.0%), and 53 were 20 (7.2%).

Measures

Vocational factors.—The Kuder-C questionnaire was used to assess the professional interests of the participants (Kuder, 1982). This questionnaire assesses professional interests using 10 different occupational fields: Outdoor, Mechanical, Arithmetical, Scientific, Persuasive, Artistic, Literary, Musical, Welfare, and Administrative (Kuder-C reliability was .90 using Cronbach coefficient alpha). This purpose of this questionnaire is to help students to analyze occupations, choose a career, and orientate their training and vocational activities to achieve greater present and future satisfaction. Its specific uses are to highlight those vocations that involve activities similar to their preferences, and to assess whether the respondent's tendency towards an occupation is consistent with the type of tasks that they ordinarily prefer to undertake.

Personality.—Personality characteristics were measured by Cattell's 16 PF-5 questionnaire (Cattell, Cattell, & Cattell, 1993; Russell & Karol, 1994) that evaluates personality factors using a bipolar response scale: (A) warmth, reserved vs. warm; (B) reasoning, concrete vs. abstract; (C) emotional stability, reactive vs. emotionally stable; (E) dominance, deferential vs. dominant; (F) liveliness, serious vs. lively; (G) rule-consciousness, expedient vs. rule-conscious; (H) social boldness, shy vs. socially bold; (I) sensitivity, utilitarian vs. sensitive; (L) vigilance, trusting vs. vigilant; (M) abstractedness, grounded vs. abstracted; (N) privateness, forthright vs. private; (O) apprehension, self-assured vs. apprehensive; (Q1) openness to change, traditional vs. open to change, (Q2) self-reliance, group-oriented vs. self-reliant; (Q3)

perfectionism, tolerates disorder vs. perfectionist; (Q4) tension, relaxed vs. tense. Four other second order factors were examined: extraversion (EX), anxiety (AX), tough-mindedness (TM), and independence (IN) (Cattell's 16 PF-5 reliability was .80 (Cronbach alpha). Although it is possible to obtain other scores (such as leadership, creativity, etc.) as well as a validation index (motivational fluctuation), in this study the 16 first-order and the four second-order factors were used exclusively.

Degree preference.—All participants were asked to identify which topic they would like to study of the 52 different university majors. This variable was named Degree Subject Chosen. Their answers allowed creation of two different groups based on preferences: Science/Technology and Humanities/Social Sciences.

Procedure

Face-to-face individual interviews and the questionnaires, Kuder-C and Cattell's 16 PF, were used to collect data during four different sessions. The interviews and questionnaires were administered in the towns and villages where the participants lived. In order to meet the geographical demands of this project, 25 College of Education graduate students assisted in administering the questionnaires and interviews. These graduate students, who were taking a 4.5-credit Professional Orientation course, attended a six-hour training session specific to administration of the Kuder-C, Cattell's 16PF, and interview procedure.

Results

Sex Differences

Analyses of variance were run to check for sex differences in vocational preferences orientation and personality traits; no statistically significant differences were found. Although some Kuder-C factors showed significant sex differences (Table 1), when the discriminant functions by group (Degree Subject Chosen, dichotomously constructed variable Social Sciences/Humanities and Science/Technology) were defined, they did not show significant differences ($F = 1.936; p > .01$). Similar results occurred with the 16PF questionnaire. Sex differences were found, with women scoring higher on Warmth, Shrewdness, and Sensitivity, and men scoring higher on Intelligence, Self-Sufficiency, and Tension. However, those differences were not associated with vocational orientation choice (Pearson $\chi^2 = 1.262, p > .05$). Therefore, sex did not seem to be a significant variable in the relationship between personality traits and general preference for topic of university study (Table 1).

Comment [SA11]:
Table 1

Cluster Analysis of Kuder-C Vocational Factors

The data refer to a total of 52 different study choices, but the Spanish university system offerings can be clustered into two areas: Science/Technology and Humanities/Social, following the high school model. The 52 degree choices were clustered following the two-type model which allowed calculation of the relations between Degree Subject Chosen and the professional interests described by the Kuder-C vocational factors. A hierarchical cluster analysis was performed on the data with SPSS Version 10, using average linkage between groups. All the possible groups were identified using the Degree Subject Chosen as the grouping criterion: participants were classified into Science/Technology or Humanities/Social Sciences groups according to the self-report of university study preferred. There were 311 participants in the Science/Technology group, and 424 in the Humanities/Social Sciences group. The 10 factors of the Kuder-C were dependent variables. A dendrogram was constructed using the 10 Kuder-C

variables, with the aim of determining which Kuder-C factors were related to the Degree Subject Chosen group classification. As shown in Fig. 1, two Vocational Orientations were obtained. The first orientation, defined by the Kuder-C factors Arithmetical, Scientific, Outdoor, Administrative, Mechanical, and Artistic, was more representative of those preferring to study Science/Technology topics. The second included the remaining Kuder-C factors: Persuasive, Musical, Literary, and Welfare, which were more representative of those who preferred studies in Humanities/Social Sciences (Fig. 1).

Comment [SAI2]:
Fig 1

Vocational Orientations and Personality Variables

Once the two professional Vocational Orientations had been defined, personality profiles were examined in relation to each of them (Lindley & Borgen, 2000). Discriminant analysis was performed with the two Vocational Orientations as independent variables, and Cattell's 16PF factors as dependent variables. The analysis differentiated between the two Vocational Orientations relative to the 16PF factors (Wilks lambda = .593; $\chi^2 = 66.30$; $p < .0001$; see Table 2). According to the results, the 16PF variables with the most weight in the canonical discriminant function were sensitivity (.93), warmth (.57), impulsiveness (-.49) and emotional stability (-.43). These four variables discriminated between the two Vocational Orientations.

Comment [SAI3]:
Table 2

Discussion

The extraversion trait correlates significantly with the Mechanical, Arithmetical, and Persuasive interests that do not belong to the same group. Interestingly, extraversion was negatively correlated to Mechanical and Arithmetical, in the Science/Technology group. In addition, a positive correlation exists with the persuasive factor in the Humanities/Social Sciences group. It is possible that individuals who scored high on the Persuasive factor present

higher self-sufficiency and high emotional lability, and these characteristics might lead them to take risks in new situations (Tokar & Swanson, 1995). In the case of participants with interests that were oriented more towards Mechanical and Arithmetical, higher emotional control might be indicated.

The tough-mindedness trait was negatively correlated with the Artistic factor, suggesting that participants with a more artistic orientation usually present character traits more inclined towards breaking conventionalisms. These individuals tend to be simple, confident, with lower self control, and do not aim to control or dominate others. Nordvik (1996) obtained similar results with young Norwegians in a study that analyzed university students' choices using the RIASEC model (Holland, 1997). Ward, Cunningham, and Wakefield (1976) verified the strong correlation between the scales of Cattell's 16 PF-5 questionnaire and Holland's Inventory of Vocational Preferences.

Finally, it was found that the independence trait correlates negatively with the persuasive and welfare interests. This correlation suggests that participants oriented towards Persuasive and Welfare interests presented higher dependence on others. These individuals tend to be confident, practical, and conservative. These results coincide with Tokar, *et al.*, (1998), and several other studies that reached this same conclusion (Caprara, Barbarenelli, & Borgogni, 1995; Tokar & Swanson, 1995; Nordvik, 1996; Schinka, Dye, & Curtiss, 1997; Hurtz & Donovan, 2000).

Although a series of studies support that theories of personality can be quite valuable in determining vocation choice (Greenberg & Baron, 1995; Holland, 1997; Tokar, *et al.*, 1998), career development and professional choices are influenced by a number of factors, of which personality traits are just one component (Gottfredson, 1999; Hurtz & Donovan, 2000; Lindley

& Borgen, 2000; Martínez-Vicente & Valls, 2001). In addition, the most recent research confirms that vocational preferences are influenced by all of the experiences of a given individual as a consequence of their sex, age, race, social status, etc. (Furnham, 2001; Furnham, *et al.*, 2002), that allow the individual to generate self expectations (Bandura, Caprara, Barbaranelli, & Pastorelli, 2001).

When results are compared to those obtained from workers in Britain and Greece by Furnham, *et al.*, (2005), there was not such a direct relationship between personality traits and the chosen occupational area. However, even if vocational orientation is not completely conditioned by personality traits, the search for a career could be. Furthermore, the main theories of professional career development are being re-examined and grouped under the concepts of career maturity (the ability to take decisions about life in general and about career in particular) and of salience (the value that individuals give to each of the roles that they occupy in their lives).

More research is necessary, since it allows educational psychologists and counselors to focus career orientation more effectively, particularly for students in the final year of high school who have not yet decided what degree to take. This is particularly important in Spain where the university system is largely focused on two broad areas (Humanities/Social Science and Science/Technology). Two of three young people of an age to start university are unclear about what to study, so there is a need for tools that provide valid and useful information to guide these students. Considering personality traits and their relationship with professional interests as another source of data is a good strategy for making decisions in vocational and professional orientation programs developed in high school settings.

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Fig. 1. Dendrogram of the hierarchical cluster analysis. The 10 Kuder-Richardson factors are represented in capital letters. After data comparison, several clusters are generated according to the distance between the different factors (recalculated for integer numbers scale 0 to 25). At level 25, two clusters are obtained: Science & Technology and Social Sciences (Degree Subject Chosen).

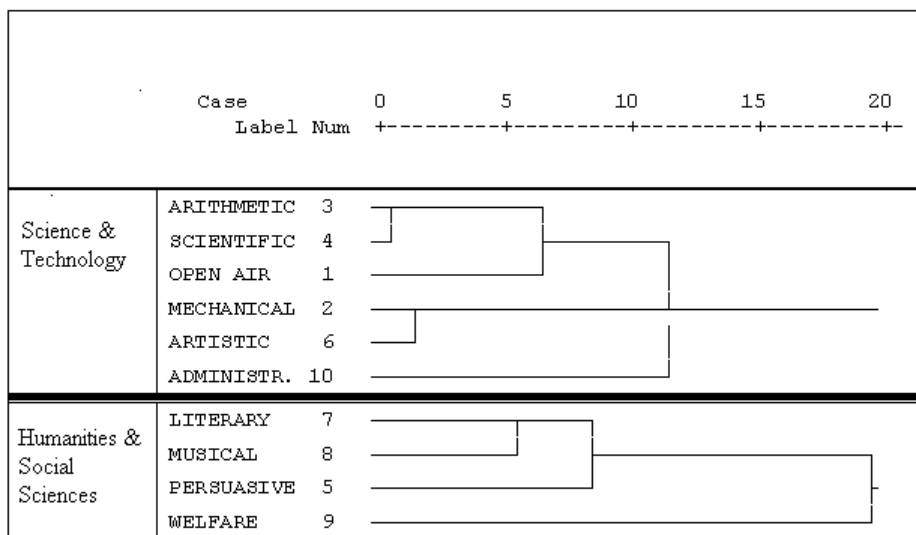


Table 1. Sex Differences in Analysis of Variance for Kuder-C and 16PF Questionnaires Scores

Kuder-C	<i>F</i>	<i>p</i>	16PF	<i>F</i>	<i>p</i>
Outdoor	30.10	.001	Warmth	40.44	.001
Mechanical	0.99	ns	Intelligence	28.07	.001
Arithmetical	10.23	.001	Emotional Stability	1.72	ns
Scientific	4.77	.029	Dominance	0.33	ns
Persuasive	1.41	ns	Impulsiveness	0.94	ns
Artistic,	0.08	ns	Conformity	1.47	ns
Literary	10.85	.001	Boldness (shy vs bold)	6.12	.014
Musical	0.13	ns	Sensitivity	16.72	.001
Welfare	1.12	ns	Suspiciousness	0.58	ns
Administrative	9.37	.002	Imagination	1.01	ns
			Shrewdness	8.80	.003
			Insecurity	1.63	ns
			Radicalism	0.03	ns
			Self-Sufficiency	27.63	.001
			Self-Discipline	4.75	.03
			Tension	12.70	.001

Table 2. Discriminant Analysis For Cattell's 16PF by Vocational Orientation

Function	Eigenvalue	% Variance	Canonical correlation	Wilks λ	χ^2	<i>p</i>
1	.69	100	.64	.59	66.31	.001
	Correlation 16PF & Discriminant Function		Canonical Standardized Function Coefficient			
Warmth	.537			.572		
Intelligence	.513			-.299		
Emotional Stability	-.314			-.426		
Dominance	-.133			-.063		
Impulsiveness	-.132			-.486		
Conformity	.119			-.061		
Boldness	.117			.355		
Sensitivity	-.106			.930		
Suspiciousness	.060			-.029		
Imagination	.047			-.110		
Shrewdness	-.040			-.083		
Insecurity	.037			-.187		
Radicalism	-.034			-.014		
Self-Sufficiency	.030			-.125		
Self-Discipline	-.016			.150		
Tension	-.015			-.122		

Comment [SA14]:
Round all to 2 decimal places