

La Clave Profesional: Validation of a Vocational Guidance Instrument

María J. Mudarra¹ & Ángel Lázaro-Martínez²

¹ Vice-Dean of Faculty of Education, Department of Educational Research
Methods and Assessment, MIDE II,
(National University of Distance Education, UNED)

² Emeritus Full Professorship at Department of Psychopedagogy,
University of Alcalá

Spain

Correspondence: María José Mudarra. Dpto. MIDE II. Facultad de Educación. UNED. C/ Juan del Rosal 14.
28040. Madrid. Spain. E-mail: mjmudarra@edu.uned.es

© Education & Psychology I+D+i and Ilustre Colegio Oficial de la Psicología de Andalucía Oriental

Abstract

Introduction. The current study demonstrates empirical and cultural validity of *La Clave Profesional* (Spanish adaptation of Career Key, Jones's test based on Holland's RIASEC model). The process of providing validity evidence also includes a reflection on personal and career development and examines the relationships between RIASEC types, personality traits and Spranger's Types of Men.

Method. The participants in this study were 517 secondary students between the ages of 15 and 18, attending public or private high schools. Career, lifestyle and personality factors were assessed by Career Key, Holland's Self-Directed Search, Spranger Lifestyle Test and the Cattell 16 PF.

Results. The discrimination index of the items and internal consistency of scales have effectively shown that *La Clave Profesional* is a very reliable instrument. Additionally, validity procedures demonstrate its relevant validity (criterion and construct). Furthermore, significant relationships were found between interest and personality factors.

Discussion and conclusions. Results reveal that *La Clave Profesional* has sufficient scientific and technical credibility for application to the Spanish population. Once again, relationships between RIASEC scales, personality traits and lifestyle choices suggest the need for more research on enterprising, neurotic and extraverted types.

Keywords: Holland's RIASEC model, Career Key, Career Guidance, vocational interest, validation study

Received: 06/23/14

Initial Acceptance: 07/10/14

Final Acceptance: 11/12/14

La Clave Profesional: Validación de un Instrumento de Orientación Vocacional

Resumen

Introducción. La *Clave Profesional* es un instrumento de diagnóstico para la Orientación Vocacional inspirado en “The Career Key” de Lawrence Jones, basado en el modelo RIASEC de Holland. En un contexto de reflexión sobre la identificación personal con una profesión, con las formas de vida que orientan los valores y los tipos de personalidad, se estudia la validez cultural y las propiedades psicométricas de la Clave Profesional en una muestra española.

Método. La muestra española estuvo compuesta por 517 estudiantes de Educación Secundaria de diferentes niveles educativos (edades comprendidas entre 15 y 18 años) equilibrada respecto al género y al tipo de centro educativo (público, privado). Los instrumentos aplicados fueron, además de La Clave Profesional, la Investigación Autodirigida -SDS de Holland- las Formas de Vida de Spranger y el 16 PF de Cattell. Además de análisis correlacionales entre constructos, se calcularon índices de fiabilidad y validez (alpha de Cronbach, KR-20, índices de homogeneidad y validez de los ítems) así como análisis factoriales sobre las secciones de la Clave Profesional.

Resultados. Los índices de discriminación y consistencia interna demuestran la elevada fiabilidad de la Clave Profesional. Paralelamente se verifica su adecuada validez (criterial y de constructo). Además, se demuestra la existencia de relaciones significativas entre los constructos de intereses, estilos vitales –valores- y personalidad.

Discusión y conclusiones. Los resultados de fiabilidad y validez obtenidos demuestran que la Clave Profesional posee una calidad científico-técnica adecuada para ser aplicada a la población española. Además, las relaciones halladas entre las escalas RIASEC, los factores de personalidad y los estilos vitales sugieren que es preciso seguir investigando particularmente algunos tipos como el emprendedor, el neurótico y el extrovertido.

Palabras clave: Modelo RIASEC de Holland, la Clave Profesional, Orientación Vocacional, Intereses Profesionales, estudio de validación.

Recepción: 23/06/14

Aceptación inicial: 10/07/14

Aceptación final: 12/11/14

Introduction

The purpose of this article is to present an empirical validation study of the *Clave Profesional*, a diagnostic instrument for Vocational Guidance based on the Career Key (Jones, 1987), and to do so while reflecting on the need to diagnose these vital aspects and to guide vocational choices within a complex and constantly changing society, often contradictory in its outlook.

Being oneself within the fabric of society through vocational choices

In present-day Western culture, characterized by a multiplicity of relationships and approaches, the possibility to choose exists because the social environment continues to be diverse, dispersed and diffused, just as it was described by years ago (García-Yagüe & Lázaro, 1971). We might add that such a social environment tends to be susceptible to manipulation, at times terribly fatalistic, and of course, able to invade people's privacy, their capacity for reflection, and their life choice options. If the ability to choose is an intrinsic trait of the decision process, a responsible vocational choice calls for acquisition of certain competencies and adaptability to one's immediate environment, so that a personally and socially coherent decision can be made.

Starting from a nucleus of possibilities that are received initially through inheritance and from the social fabric that contextualizes one's emotional development, each person then opens up their own path. This path is marked out progressively, not as a fatalistic consequence of destiny, but by personal decisions, with implications in terms of consequences and responsibility. Particularly since the mid-1990s, different studies have been carried out for the purpose of providing resources that improve the level of occupational information, while also promoting an appropriate cognitive structure that encourages the development of one's personal and vocational path. Personal identification with a vocation is assumed to be a developmental constant in configuring a personality that is satisfactory and productive. Starting from the empowerment approach, this study analyzes identification with ways of life that shape one's values and personality type. Expanding on the biological concept of tropism, *personality tropisms* may be considered tendencies that are defined within each person, as a specific way of existing in accordance with adopted values that are manifest in attitudes, and which develop according to stimuli in the proximal environment. Thus, a *way of being (personality type)* is like a journey by sea, where one is constantly plying the waves, as

irregular and apparently chaotic as the surface of waters, through which the navigator pilots his or her life, or pathway, hoping to improve each day, until reaching the port of destination. The way one navigates and the type of navigation are shaped by the sphere in which one navigates and the vessel one wishes to skipper; one's personal way of being is formed while advancing along one's path, and is being decided from moment to moment.

Vocational self-assessment: a key process in Guidance for Career Development

Career Development Guidance emphasizes the dynamic nature of personal development as a process that includes successive vocational choices and promotes adequate decision processes in every sphere of the individual's life (educational, work, leisure and free time). Comprehensive, systematic and well planned guidance interventions should be founded on a prior process of Career Assessment.

Vocational self-assessment is a process that leads a person through gradual self-discovery, through revising their plans and their personal development according to experiences gained and variations in the environment, personal aspirations and social opportunities. It requires gathering all relevant information in order to optimize the vocational decision process while encouraging learning, identification of problems, the suggestion of alternatives and encouragement of action steps, elements that are increasingly present in current diagnostic instruments, especially if they are self-applied. Many of these instruments are part of Vocational Guidance programs such as *Tengo que decidirme* [I must decide] (Álvarez Rojo, 1991), *Toma la iniciativa* [Take the initiative] (Delgado, 1995), *De Gira hacia el Trabajo* [On tour towards work] (Romero, 1997) and *Programa de Orientación Profesional Autoaplicado POPA* [Self-applied Vocational Guidance Program] (Corominas, Álvarez & Bisquerra, 1999), *Tu futuro profesional* [Your vocational future] (Repetto, 1999) *Sistema de Autoayuda Vocacional* [Vocational self-help system] (Rivas & López, 2003); or more recently, *GR: Herramienta de autoaplicación para la orientación académica y profesional* [GR: a self-applied tool for academic and vocational guidance] (Corominas *et al.*, 2009) and the *Programa de Orientación Educativa y Sociolaboral POES* [Educational and socio-labor guidance program] (Santana Vega *et al.* 2009).

As a stimulus in this direction, we have developed and validated a diagnostic instrument called the *Clave Profesional*, which helps outline profiles in the initial moments of personal decision making. Based on different theoretical models--typologies of ways of being,

personality, interests, vocational choices—and particularly inspired by the work of Spranger (1928), Holland (1959) and Jones (1987), it reveals the person's predominant style and way of life, so that individuals can match their characteristics to their possibilities and environmental contexts, in similar fashion to the Self-Directed Search (SDS, by Holland, 1979, 1994).

The Holland Model

Holland (1997) identified personality integration with the development of personality types, defining vocational maturity as a function of the maturity that an individual shows in making vocational choices that were consistent with certain personality and environmental types. Even though his approach may seem excessive, and some of his theoretical constructs have been widely questioned (Tracey & Robbins, 2006), his proposals have had enormous scientific impact (Gottfredson, 1999). This popularity can be explained by certain highly valued characteristics of his instruments: self-applied, simplicity in formulation and transparency in his scales, empirical evidence of their influence with regard to understanding one's own vocational behavior, and flexibility for establishing new conceptual relationships (learning about decision making, organization of occupational information and structuring of educational programs for career development). Thus, the Hexagonal Interests and Personality Model, or for short, the *RIASEC Model*, has been refined theoretically on numerous occasions (Holland, 1962, 1968, 1985, 1997; Gottfredson & Holland, 1991; Holland & Gottfredson, 1976, 1978; Holland & Nichols, 1964; Holland, Sorensen, Clark, Nafzinger & Blum, 1973), in order to more strongly emphasize both the individual's process of adapting to changing contexts (as a function of his or her personal characteristics, occupational knowledge and capacity for information transfer), and the specific study of problems that appear during this process, when the individual's adaptation system turns out to be immature or it goes wrong, causing vocational decisions that create insecurity or personal dissatisfaction.

The result of the specific combination of interests and aptitudes creates a certain disposition for the person to think, perceive and act in a particular way (Holland, 1997). Each of these personal styles can be matched to the personality types defined by Holland: Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E) and Conventional (C), corresponding in turn to six parallel types of environment. Depending on the individual's degree of adaptation to the environment—consistency between personal and environmental types—aspects may be predicted such as vocational choice, educational achievement, personal competence, social behavior and susceptibility to environmental influence

(Martínez-Vicente & Valls, 1999), stability and vocational satisfaction (Porter & Umbach, 2006), persistence in one's vocational choice (Allen & Robbins, 2008), stability of academic outcomes as a function of the environment (Smart, 2010) and even professional status as estimated by salary (Kristof-Brown, Zimmerman & Johnson, 2005).

In order to diagnose this profile of types that characterize an individual, Holland put forward different instruments and *indicators of vocational maturity* (consistency, congruence, differentiation) based on the relationships between the types in his model, that is, the relationships or similarities between the types are proportional to the distance between them in the hexagon. Finally, one of the last constructs incorporated into the model, *vocational identity*, refers to both stability in one's goals and personal self-perceptions, such as clear, explicit goals and environmental expectations (Savickas & Gottfredson, 1999).

Spranger's Types of Men: another approach to the validity of the RIASEC Model

When validating the *Clave Profesional*, studies by Eduard Spranger (1928) were also considered. Although this author has been set aside in the current paradigm of career development, his ideas are important because they gave rise to an instrument of measure, similar to what Holland would develop later on, but -- from our point of view -- having a broader, solidier and more flexible theoretical foundation. Spranger was classified prior to the 1950s as a scientific/spiritual psychologist, in addition to a philosopher on life, because he wished to understand the personality, to discover the meaning of the ways that the objective spirit manifests itself, observable in the individual's effort and struggle to make sense of being human. This *understanding* refers to the values that undergird reality; what is understood has a meaning, a value, a direction and a place in the total structure of personality, whose ultimate expression is a personal, global system of objective values. Spranger (1928) distinguishes the following types or *ways of life*: (T) Theoretical, (E) Economic, (S) Social, (A) Aesthetic, (P) Political and (R) Religious. These types are revealed through situational preferences and predispositions that manifest a person's established values. This approach is also followed by other authors from different perspectives, including Allport and Vernon (Allport & Vernon, 1931; Allport, Vernon & Lindzey, G., 1951), whose personality theory became widespread and popular. They produced a measurement instrument called "Study of Values", published in Spanish as *Cuestionario de Ideas Personales* by the Institute of Pedagogy "San José de Calasanz" of the *Consejo Superior de Investigaciones Científicas*, translated and adapted by García-Yagüe (1957).

However, it is necessary to analyze the *cultural validity* of these theoretical models. The structure of vocational interests and their relation to other personality models has generated a great deal of scientific and research debate in different countries with culturally diverse samples, in order to verify whether its principles hold true (Gottfredson, 1999). In the Spanish population, regarding the Holland model, there is noteworthy research from Castaño, López-Navarro and Domínguez (1979) with a sample of university students; Fernández Eire (1997) with adolescents from Galicia; Martínez Vicente and Valls, (2001, 2006) with a sample of individuals between the ages of 12 and 41; Martínez-Vicente (2001, 2007) and Mudarra (2003, 2007) with a sample of 762 students from secondary education.

Using the SDS as the common instrument of reference for the studies cited, these authors conclude that Holland's proposed personality structure is manifest in the samples studied, with the Social and Conventional scales being especially reliable (Lewis & Rivkin, 2000; Mudarra, 2007; Rounds et al., 1999). Certain qualifications must be made, such as finding a greater affinity between adolescent males in the types indicated (Fernández Eire, 1997), and the appearance of certain small maladjustments between types, particularly in the RC relationship and in type I relationships with types A, S and C (Valls Fernández & Martínez Vicente, 2001). Women's preferences for social and artistic interests have also been confirmed, in contrast to men, who prefer realistic interests (Mudarra, 2003). The latter result is probably explained by traditional cultural roles and their associated self-efficacy expectations, but in any case, guidance counselors must be attentive to avoid gender-based bias both in the instruments themselves as well as in vocational choices. Similarly, relationships between personality models (such as the Big Five) and interest models are usually confirmed, with moderate relationships often modulated by the gender variable (Caprara et al, 2001; Mudarra, 2003; Tokar & Swanson, 1995). Thus, it seems that the different types tend to be stable over a certain period of time, but may undergo changes, even radical ones, at different periods of life, depending on one's values and social and personal circumstances.

Objectives

In summary, there continues to be a need for studies to verify the cultural validity of Holland's typological model, and of instruments that are based on it. From an empirical perspective, the *objective of the validation study* presented in this article is to verify the

RIASEC model in a Spanish sample. At the same time, *certain theoretical assumptions are analyzed* such as *relations between types of values and personality factors*. In this way, in addition to enriching and clarifying the results of prior research, we offer criteria for evaluating the application of a new psychopedagogical instrument, the *Clave Profesional*, while at the same time consolidating its theoretical configuration according to the values hierarchy proposed by Spranger.

Method

Participants

Participating in this study were 517 students from four schools in the Madrid region, intentionally selected according to the following criteria: a balance between public and private schools, a comparable socio-economic-cultural level (intermediate in this case) and sample accessibility according to resources available for the study and according to the deontological code. Thus, a balanced sample was obtained with regard to type of school (40% of students from private schools and 60% from public high schools). Students between the ages of 15 and 18 were selected, in other words, from the level of *bachillerato*, two years of post-compulsory secondary education oriented toward university preparation, since vocational tendencies at this age are more stable than in earlier years of secondary education, and they have begun scientific and vocational studies that allow them to discover what activities they prefer. As for grade level, a slightly higher percentage (57%) of first-year *bachillerato* students was observed.

As for student gender, the sample is also balanced (47.8% male and 52.2% female), with a slight predominance of women at both grade levels, as occurs in similar research studies (Valls Fernández & Martínez, 1999).

Instruments

The Clave Profesional (Lázaro & Mudarra, 2014)

This is a self-applied instrument inspired by the Career Key by Jones (1987), who pursues the line of Holland, carrying out his work at the University of North Carolina. Published initially by the Ferguson Publishing Company, since 1997 it is also available as a self-applied instrument on Internet (www.careerkey-ca.org) as a free public service for

secondary students, adapted for different countries (Canada, Mexico, India, China, Korea, Romania, Vietnam, Turkey, etc.). Both formats (online and pencil-and-paper) differ only in that the Internet version offers real-time interaction (for example, the chance to view all information available on a particular occupation, at any moment. The author (Jones, 1989) indicates that the instrument is similar to the SDS (Holland, 1994) in several aspects: it is a self-assessment, based on the 6 types of Holland, it identifies new occupations in the list of occupations that is attached to the test itself, and suggests steps to take as part of a vocational guidance process that requires career exploration and facilitates decision making.

The *Clave Profesional* that we offer, just as the Holland and Jones tests, is structured into the following sections shown in Figure 1.

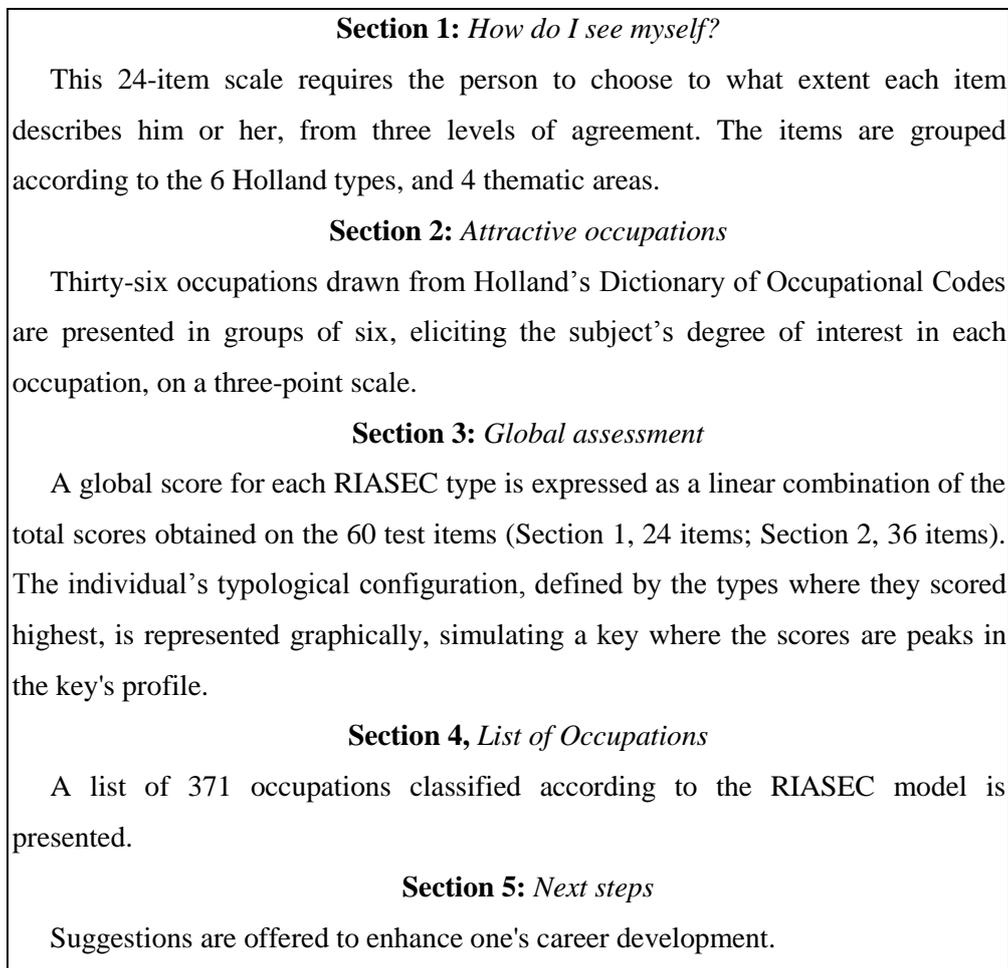


Figure 1. Sections of the Clave Profesional

The Self-Directed Search (SDS) (Holland, 1994)

Another self-applied test, it is composed of the *Assessment Booklet*, with sections on vocational fantasies, preferences, competencies, jobs, skills; the *Occupations Finder*, 1335

occupations ordered by types and level of education; and the *Interpretive Report: you and your career*, which offers guidance on interpretation, common problems and additional sources of information. Although the present study made use of Holland's (1994) adaptation, many adaptations exist, of which we would note those from Martínez-Vicente (2001) and Martínez-Vicente and Valls (2006).

Spranger's Types of Men (Spranger, 1928)

In order to study the relationship between Holland's typology model and values and personality factors, two instruments were applied: the *Cuestionario de Ideas Personales* [questionnaire on personal ideas] (García-Yagüe, 1957, Spanish adaptation of the Study of Values test (Allport & Vernon, 1931)) and the *Cuestionario Factorial de Personalidad*, or 16 PF (Cattell, 1975). The *Cuestionario de Ideas Personales* indicates 6 ways of life, or values, that correspond to Spranger's six idealized types of men (Theoretical, Economic, Aesthetic, Social, Political and Spiritual), according to the value that predominates in each person. In order to explore the student's personal ideas, in addition to expressing preferences, he or she must make judgments as to the importance of certain statements (values).

The Cuestionario Factorial de Personalidad (16 PF) (Cattell, 1975)

Used widely, this questionnaire does not require a detailed description, we would only note that its scales present theoretically substantiated factors, adequate reliability and validity.

Procedure

In order to verify the typological structure of Holland and validate the *Clave Profesional*, the principal investigators and a team of collaborators (randomly assigned to the different student groups), applied the *Clave Profesional* together with the SDS, the 16 PF and the Study of Values, maintaining both the order of application as well as the time interval between applications in order to avoid biases due to the maturation effect. In no case did the total application last longer than 90 minutes. Several reliability and validity analyses were performed in order to study the technical characteristics of the *Clave Profesional*; and other complementary correlational studies – with the 16 PF and the Study of Values – were carried out to explore construct validity and make proposals for improvement.

Data analysis

Data analysis was performed using the IBM program, SPSS 19. In order to determine the internal consistency of each RIASEC scale and the global reliability of the test, Cronbach's α statistic was calculated; criterion and concurrent validities were measured through association indices between the RIASEC scales and the SDS scales. The hexagonal structure of the *Clave Profesional* was explored through several factor analyses, using the Principal Components method. Each item's functionality within its respective scale was evaluated by calculating its homogeneity and validity indices. Finally, the relationships between the constructs *interests*, *ways of life* and *personality* were studied through specific correlational analyses.

Results

Analysis of technical characteristics

Reliability

Reliability or *internal consistency* of each of the RIASEC scales and the *Clave Profesional* as a whole was obtained by calculating the respective Cronbach α coefficients and Kuder-Richardson 20 (for dichotomous items, for their later comparison with the instrument's original version), as shown in Table 1.

Table 1. Reliability coefficients of the RIASEC scales and the Clave Profesional

RIASEC Scales	Cronbach α	KR-20
(R) Realistic	.723	.717
(I) Investigative	.850	.857
(A) Artistic	.821	.759
(S) Social	.735	.660
(E) Enterprising	.802	.784
(C) Conventional	.724	.739
<i>Clave Profesional</i>	.802	.819

Levels of *global reliability* are high, and even greater than the values obtained on some of Jones's scales (1989). In addition, the values are adequate and in line with what is typically found for this type of instrument, test-retest coefficients [.7, .89] and Cronbach α [.86, .91] (Jones, 1989; Holland, 1985, Jones & Ward, 2002; Martínez-Vicente, 2003). As for the *reliability of the scales*, indices are quite satisfactory, especially if we consider the small

number of items that make up each type. Thus we confirm the solid *consistency of the adapted instrument*, and in particular, of the *Investigative scale*, which is the most reliable.

Criterion Validity

Criterion validity, with its great diagnostic utility, was calculated using the SDS (Holland, 1994) as the reference; the intercorrelations obtained are shown in Table 2. Fit between the scales of both instruments had been studied previously, with no significant differences found between their scales (Jones, Gorman & Schroeder, 1989).

Table 2. Intercorrelations between the Clave Profesional and the SDS

RIASEC Scales	R _{XY}
(R) Realistic	.613**
(I) Investigative	.821**
(A) Artistic	.832**
(S) Social	.711**
(E) Enterprising	.737**
(C) Conventional	.715**

** $p < .01$

Validity indices for all the scales of the Clave Profesional were significant and high, thereby confirming the instrument's underlying RIASEC model, and in particular, the well-defined Artistic and Investigative scales.

Given that delimiting the typological profile involves classifying subjects into 6 types, the degree of agreement was also calculated between students' classifications in the first type as defined by the *Clave Profesional* and the SDS, using the Kappa coefficient (with values between -1 and 1, indicating zero randomness in the classification). A significant Kappa value (.338, $p < .05$) confirmed a moderate degree of agreement between the classifications on the two instruments, similar to that obtained by Jones (1989, 1990) (.37, $p < .05$).

Construct Validity

The theoretical hexagonal structure that underlies the *Clave Profesional*, as shown in Figure 4, was verified by calculating the correlations matrix between their scales. The most consistent significant intercorrelations per the Holland model, at a level of .05 significance, were RC, IS and SE, followed by RI, AS, SC and EC. The consistency of type configurations

presented in our sample concurs in part with Holland's most consistent configurations (RI, RC, AS, SE, CE) and a few others with intermediate consistency (IS, SC). Regarding the magnitude of the intercorrelations, this is usually lower than what is expected theoretically, and even certain intercorrelations that do not meet the hexagonal layout are often detected empirically, such as in the case of the relationships RS, RE, IC, AE, which were not significant in the present sample (Castaño *et al.*, 1979; Jones, 1990; Fernández Eire, 1997; Holland, 1973, 1994; Lewis & Rivkin, 2000; Valls, 1999; Valls & Martínez-Vicente, 2001).

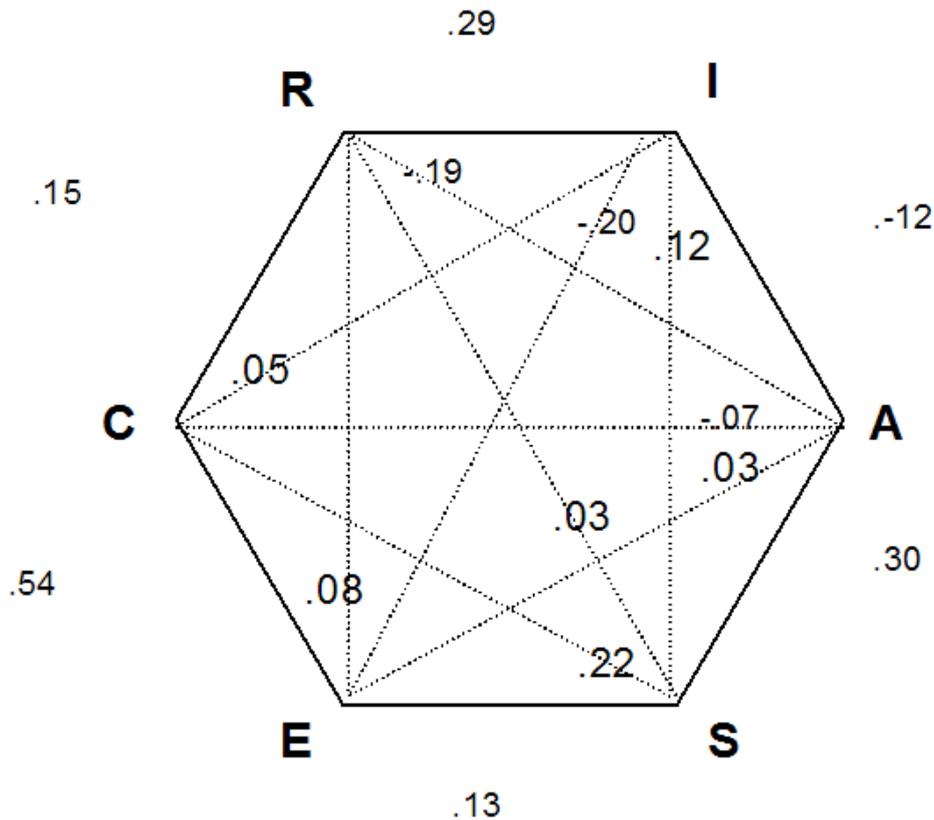


Figure 4. Correlations between the RIASEC types (Clave Profesional)

Nonetheless, construct validation is a process that involves diverse studies that collect multiple evidences about the nature of the construct, for this reason we also performed several factor analyses on the first two sections of the *Clave Profesional*, How do I see myself? and Preferred occupations, in order to check whether the six RIASEC types were clearly defined within the set of items in each section (from 1 to 24 and from 25 to 60, respectively). In summary, several factor analyses were performed for each of the sections, obtaining the corresponding factor matrices derived from orthogonal rotations (Varimax method) and oblique rotations (Direct Oblimin method), but in both cases factor interpretations were taken from the orthogonal rotations since the oblique provided very little additional information. The selection of six factors in the two cases explained 58% and 51% of the total variance for

Sections 1 and 2, respectively; these percentages are acceptable in comparison with those obtained in similar studies (Holland & Gottfredson, 1992). In addition, the commonalities of all items ranged within the intervals [.7, .4] and [.7, .3], in Sections 1 and 2 respectively, factor solutions showing good representative quality in both cases, especially in items 5(I), 9(A), 18(E), 1(R), 6(I), 10(A), 13(S), 17(E), 39(R), 59(I), 35(I), 45(I) and 60(E). Nevertheless, after analyzing the orthogonal matrices, the following observations can be made:

- In Section 1, the existence of 6 underlying factors matching the Holland types is clearly visible, defined principally by the items indicated in Table 3. The only item to be eliminated, due to its low representative quality (commonality=.34) and its saturation in a factor that theoretically would not correspond to it (Factor VI Conventional, instead of Factor IV, Realistic), would be item 4 *-I am realistic*. Further refinement would also be needed in defining items 16 *-I am friendly, approachable*, 23 *-I value business success*, and 24 *-I am neat*.

Table 3. Factors defined in Section 1 of the Clave Profesional

Factors	I	II	III	IV	V	VI
Types	E	I	A	S	R	C
Items	17, 18, 19, 20	5, 6, 7, 8	9, 10, 11, 12	13, 14, 15	1, 2, 3	21, 22

Note. E= Enterprising; I= Investigative; A= Artistic; S= Social; R=Realistic; C= Conventional

- In Section 2, as illustrated in Table 4, factors I (I), III (S), IV (A) and V (R) are very well defined. However, there is a great deal of confusion between the Conventional and Enterprising types in the attractive occupations, so that factors II and VI do not seem to be clearly defined. Consequently, Section 2 seems to be more poorly defined from the typological point of view, suggesting a need to revise the attractive occupations belonging to the Conventional and Enterprising types.

Table 4. Factors defined in Section 2 of the Clave Profesional

Factors	I	III	IV	V
Types	I	S	A	R
Items	59, 35, 45, 47, 57, 33	28, 52, 38, 50	56, 42, 32, 30, 54, 44	39, 27, 51, 25

Note. E= Enterprising; I= Investigative; A= Artistic; S= Social; R=Realistic; C= Conventional

Analysis of items

Analysis of the *Homogeneity Index* revealed that, in general, *all the items produced homogeneity values greater than .1, except for item 26 ("sports coach", Social scale, H.I. =.017)*, which should consequently be eliminated. This result, together with the previous factor analyses, lead us to conclude that items 4 ("I am realistic, R), 44 (graphic designer, A) and 24 ("I am neat", C), should be revised.

On the other hand, all the Validity Indices obtained from correlating each item with the total score of its corresponding SDS scale were satisfactory, and greater than .1 (except item 26, sports coach, S, V.I. = .08). Similarly, if we consider their low validity indices, the following items should be improved: 4 (R), 44 (A), 24 (C) and 3 (R).

Relations between the Holland Model, the 16 PF, and the Study of Values

Given that *Clave Profesional* should reflect a personality typology in line with Holland's typology of interests as an expression of personality, and that Spranger's Types of Men forms part of the theoretical background in creating this instrument, we decided to study the relationships between the three scales – 16 PF, the *Cuestionario de Ideas Personales* (based on Spranger's types) and the *Clave Personal* – analyzing their intercorrelations. The following observations are presented as a summary (all of them referring to significant relationships, $r \geq .3$, $p < .05$):

- Certain *gender-related differences in the Holland types* are identified. In particular, significant relations between the personality factors of the 16 PF and the Conventional and Enterprising types are not found in men, but only in women. Namely, positive relationships are found between the Enterprising type, Extraversion and Independence ($r = .392$, $p < .01$ and $r = .349$, $p < .05$, respectively) and negative relations between the Conventional type and Anxiety ($r = -.294$, $p < .05$).
- The Realistic type, in men, is positively related to Independence ($r = .335$, $p < .05$). In women, this type is negatively associated with Extraversion ($r = -.266$, $p < .01$) and positively with Self-sufficiency ($r = .283$, $p < .05$).
- The Investigative type, in men, is positively related to Independence ($r = .375$, $p < .05$), and negatively with Socialization ($r = .392$, $p < .05$), while in women the Investigative type shows positive relationships with Anxiety ($r = .286$, $p < .05$).

- Only in the case of women, the Artistic type is positively related to Extraversion ($r = .328, p < .05$), and negatively with Socialization ($r = -.279, p < .05$) and the Social type is related positively to Extraversion ($r = .394, p < .01$).

As for relations between the RIASEC types and the Study of Values, we observe that:

- The Investigative type seems to be very well defined as it has a positive correlation with Spranger's Theoretical type and a negative correlation with the Economic type, for both men ($r = .507, p < .01, r = -.353, p < .05$) and women ($r = .376, p < .05; r = .377, p < .05$).

- The RIASEC Artistic type is not significantly related to the Spranger Artistic type. In the case of women, this type is positively related to economic values ($r = .377, p < .05$). In women, it is negatively related to political values ($r = -.357, p < .05$).

- The RIASEC Social type, in women, is related to the Spranger's Social type ($r = .347, p < .05$), while in men it has a stronger connection with Religious values ($r = .421, p < .05$).

- The Enterprising type is positively related to Political and Artistic values in women ($r = .330, p < .05$ and $r = .334, p < .05$ respectively). In men, it is related negatively to Theoretical values ($r = -.350, p < .05$).

- The Conventional type is not significantly related to values in men. However, in women it is positively related to Political values ($r = .366, p < .01$) and negatively to Economic values ($r = -.284, p < .05$).

Discussion and Conclusions

The results allow us to assert that *Clave Profesional* is an instrument for Vocational Diagnosis and Guidance, in line with Holland's typological model, and valid in Spanish samples that are similar to the present study sample. It is very reliable both globally (.8014), and in each of its scales, especially the Investigative; criterion validity is quite adequate, especially in the Artistic and Investigative scales, and it makes classifications that are significantly similar to those of the SDS. Its hexagonal structure is confirmed globally, detecting Holland's six factors. However, Section 1 has better definition than Section 2, where occupation items that define the Enterprising and Conventional types need to be reformulated. For their part, intercorrelations with the RIASEC scales follow the same trends as those obtained in Holland's studies (1985, 1994) and studies from other Spanish authors (Fernández

Eire, 1997; Martínez Vicente & Valls, 1999, etc.), such that certain correlations appear due to their theoretical coherence (RI, AS, SC, EC). However, there are also small maladjustments in the relationships between types, especially in the Conventional scale, which always seems to be the most poorly defined, even when this type of instrument is applied via Internet (Levinson, Zeman & Ohler, 2002). The analysis of items confirms that *Clave Profesional presents satisfactory homogeneity and validity indices*. However, we suggest that items 4, 24, 26 and 44 be eliminated or reformulated, and items 3, 16, 23, 37, 40 and 49 be redefined and tested to see whether such modifications affect the technical quality of the instrument.

At the same time, relationships with other constructs such as values and personality models from the 16PF have been confirmed, with certain qualifications. Regarding *relationships between the Clave Profesional and the 16PF*, as Holland and Gottfredson affirmed (1992), it does not appear that these two types of tests are interchangeable, even though it is evident that there are significant relationships between the constructs of interests and personality. Relationships between the RIASEC scales and the Extraversion dimension (Goh & Leong, 1993) have been confirmed, in particular, positive relationships with the Social and Enterprising types (Tokar & Swanson, 1995), but other relationships are less clear, such as the negative relationships between the Enterprising type and neuroticism, the Investigative type and extraversion, and between the Enterprising type and extraversion, the latter being confirmed only for women.

Perhaps Holland's typological model involves a different approach to personality, something to be investigated with other personality models such as the Big Five, where the common language facilitates a basis for studying relationships between the two domains.

As expected, we found various *relationships between the Holland model and Spranger's Types of Men*, some of them very consistent, such as the positive connection between the Investigative type and Theoretical values, and its negative connection with Economic values; the relationship between the Social type and Social values (especially in women) and between the Enterprising type and Political values. Nevertheless, other results (the absence of any relationship between the Artistic type and Artistic values) indicate a need for further research that inquires further into the relationships between the two constructs.

In short, a new instrument has been made available, the *Clave Profesional*, valid in our cultural context and having great utility, due to its brevity and motivating nature, for diagnosing ways of life (values) and vocational orientation. This type of instrument proves to be very effective, efficient and stimulating in career exploration, especially when it is followed up with specific suggestions for looking into vocational opportunities (Jones, 2000). However, future studies in our cultural context are recommended, in order to analyze its convergent and divergent validity, confirmatory factor analyses, etc., useful for improving the instrument as well as for studying the impact that this type of instrument may have both on students who are less "active" in their vocational exploration and on those whose professional and educational aspirations are extremely diverse.

Finally, this type of empirical study makes it possible to re-develop a theoretical structure that is more consistent with the individual self-regulation that leads to an understanding of the "internal fermentation" of one's personality, constantly bubbling up among one's needs, interests, abilities, Holland's environmental types and Spranger's ways of life. Cognitive self-regulation in vocational choice processes makes it possible to match up a "way of life" or consistent behavioral patterns with each person's adopted values, and these assumptions are essential to taking decisions and self-regulating one's personal development.

References

- Álvarez Rojo, V. (1991). *Tengo que decidirme*. [I must decide.] Sevilla: Alfar.
- Allen, J. & Robbins, S. (2008). Prediction of college major persistence based on vocational interests and first-year academic performance. *Research in Higher Education*, 49, 62-79. <http://dx.doi.org/10.1007/s11162-007-9064-5>
- Allen, J. & Robbins, s. (2010). Effects of interest-major congruence, motivation, and academic performance on timely degree attainment. *Journal of Counseling Psychology*, 57, 23-35. <http://dx.doi.org/10.1037/a0019085>
- Allport, G.W. & Vernon, P.E. (1931). A test for personal values. *Journal of Abnormal and Social Psychology*, 26, 231-248. <http://dx.doi.org/10.1037/h0073233>
- Allport, G.W., Vernon, P.E. & Lindzey, G. (1951). *Study of values*. Cambridge: Cambridge University Press.
- Caprara, G.V., Barbaranelli, C. & Borgogni, L. (2001). *BFQ Cuestionario "Big Five"* (3rd ed.). Madrid: TEA.
- Castaño, C. (1977). *Uso del Temario Vocacional de García Yagüe en la orientación de estudios*. [Using García-Yague's vocational topic list in student guidance.] Madrid: Miñón.
- Castaño, C., López Navarro, J.A. & Domínguez, A. (1979). Verificación en la población española de la estructura de intereses de la hipótesis tipológica de Holland. [Verifying the interest structure of Holland's typological hypothesis for a Spanish population.] *Revista de psicología general y aplicada*, 160-161, 943-946.
- Cattell, R.B. (1975). *Cuestionario de personalidad 16 PF*. [16 PF personality questionnaire.] Madrid: TEA.
- Corominas, E, Álvarez González, M. & Bisquerra, R. (1999). *Programa Autoaplicado de Orientación Profesional* [Self-applied vocational guidance program.] (POPA). Barcelona: Servicio de publicaciones de la Generalidad de Cataluña.
- Corominas, E, Álvarez González, M. & Bisquerra, R. (2009). *GR: Herramienta de autoaplicación para la orientación académica y profesional*. [GR: a self-applied tool for academic and vocational guidance.] Accessed from <http://http://orientacion.educaweb.com/es/presentacion>.
- Delgado, J.A. (1995). *Toma la iniciativa. Programa de Orientación Vocacional para el primer grado de la ESO*. [Take the initiative. A vocational guidance program for first-year secondary school.] Granada: Universidad de Granada.

- Fernández Eire, L. (1997). *Eleccións de Carreiras e Profesións: Adaptación Self-Directed Search, forma regular (1994) a adolescentes galegos* (Doctoral thesis). [Career and vocational choices: adaptation of the Self-Directed Search, regular form (1994) for Galician adolescents.] Santiago de Compostela: Servicio de Publicaciones e Intercambio Científico de la Universidad de Santiago de Compostela.
- García-Yagüe, J. (1957). *Cuestionario de ideas personales*. [Questionnaire on personal ideas.] Madrid: CSIC.
- García-Yagüe, J & Lázaro, A. (1971). *Condicionamientos ambientales de la personalidad*. [Environmental influences on personality.] Madrid: Magisterio español.
- Goh, D.S. & Leong, F.T.L. (1993). The relationship between Holland's Theory of Vocational Interest and Eysenck's Model of Personality. *Personality and individual differences*, 15, 555-562. doi: 10.1016/0191-8869(93)90339-5
- Gottfredson, G.D. (1999). John L. Holland's Contributions to Vocational Psychology: A Review and Evaluation. *Journal of Vocational Behavior*, 55(1), 14-40. doi: 10.1006/jvbe.1999.1695
- Gottfredson, G.D. & Holland, J.L. (1991). *Position Classification Inventory: Professional Manual*. Odessa, FL.: Psychological Assessment Resources.
- Gottfredson, G. D., & Johnstun, M. (2009). John Holland's contributions: A theory-ridden approach to career assistance. *Career Development Quarterly*, 58, 99-107. doi: 10.1002/j.2161-0045.2009.tb00050.x
- Holland, J.L. (1959). A theory of vocational choice. *Journal of Counseling Psychology*, 6, 35-45. <http://dx.doi.org/10.1037/h0025350>
- Holland, J.L. (1962). Some explorations of a Theory of Vocational Choice: 1. One and two year longitudinal studies (Monograph). *Psychological Monographs*, 76, 26, Whole No. 545).
- Holland, J.L. (1968). Explorations of a Theory of Vocational Choice: VI. A longitudinal study using sample of typical college students. *Journal of Applied Psychology*, 52(1, Pt.2). 1-37. <http://dx.doi.org/10.1037/h0025350>
- Holland, J.L. (1979). *The Self-Directed Search Professional Manual*. Palo Alto, CA: Consulting Psychologist Press.
- Holland, J.L. (1985). *Making vocational Choices: a Theory of Vocational Personalities and Work Environments* (2nd ed.). Englewood Cliffs, NJ.: Prentice-Hall.
- Holland, J.L. (1994). *The Self-Directed Search*. Odessa, FL: Psychological Assessment Resources.

- Holland, J.L. (1997). *Making Vocational Choices: a Theory of Vocational Personalities and Work Environments*. (3rd ed.). Odessa, FL: Psychological Assessment Resources.
- Holland, J.L. & Gottfredson, G.D. (1976). Using a typology of persons and environments to explain careers: some extensions and clarifications. *Counseling Psychologist*, 6, 20-29. doi: 10.1177/001100007600600306
- Holland, J.L. & Gottfredson, G.D. (1978). New edition of the Self-Directed Search. *JSAS Catalog of Selected Documents in Psychology*, 8, 73, (n°1740).
- Holland, J.L. & Gottfredson, G.D. (1992). Studies of the Hexagonal Model: an evaluation or the perils of stalking the perfect hexagon. *Journal of Vocational Behavior*, 40, 158-170. doi:10.1016/0001-8791(92)90063-6
- Holland, J.L. & Nichols, R.C. (1964). Explorations of a Theory of Vocational Choice: III. A longitudinal study of change in a major field of study. *Personnel and Guidance Journal*, 11, 235-242. doi: 10.1002/j.2164-4918.1964.tb02667.x
- Holland, J.L., Sorensen, A.B., Clark, J.P., Nafzinger, D.H. & Blum, Z.D. (1973). Applying an occupational classification to a representative sample of work histories. *Journal of Applied Psychology*, 58, p. 34-41.
- Holland, J.L. & Whitney, D.R., Cole, N.S., Richards, J.M. (1969). *An empirical occupational classification derived from a theory of personality and intended for practice and research* (ACT Research Report n° 29). Iowa City: The American College Testing Program.
- Jones, L.K. (1987). *The Career Key*. Chicago, J.G.: Ferguson.
- Jones, L.K., Gorman, S. Schroeder, C.G. (1989). A comparison between the SDS and the Career Key among career undecided college students. *The Career Development Quarterly*, 37, 334-344. doi: 10.1002/j.2161-0045.1989.tb00673.x
- Jones, L. K. (1990). The Career Key: An investigation of the reliability and validity of its scales and its helpfulness to college students. *Measurement and Evaluation in Counseling and Development*, 23, 67-76.
- Jones, L.K. (1993). Two career guidance instruments: their helpfulness to students and effect on students' career. *School Counselor*, 40(3), 191-204.
- Jones, L.K. Sheffield, D. & Joyner, B. (2000). Comparing the effects of the Career Key with Self-Directed Search and Job-OE among eighth-grade students. *Professional School Counseling*, 3(4), 238-247.
- Jones, L. K., & Ward, M. C. (2002). *Equivalence of three versions of the Career Key among high school students*. Hood River, OR: Career Key.

- Kristof-Brown, A.L., Zimmerman, R.D. & Johnson, E.C. (2005). Consequences of individuals' fit at work: A meta-analysis of person-job, person-organization, person-group, and person-supervisor fit. *Personnel Psychology*, 58, 281-342.
- Lázaro, A. & Mudarra, M.J. (2005). Las competencias del orientador en la movilidad profesional. [Competencies of the guidance counselor in vocational mobility.] *Curriculum*, 18, 175-191. Accessed from <http://webpages.ull.es/users/revistaq/ANTERIORES/numero18/lazaro.pdf>
- Levinson, E.M., Zeman, H.L. & Ohler, D.L. (2002). A critical evaluation of the web-based version of the Career Key. *The Career Development Quarterly*, 51, 26-35. doi: 0.1002/j.2161-0045.2002.tb00589.x
- Lewis, P.H. & Rivkin, D. (2000). *O*Net Interest Profiler v 3.0: user's guide*. Raleigh, NC: US Department of Labor and Employment and Training Administration.
- Martínez-Vicente, J.M. & Valls Fernández, F. (1999). Estudio preliminar para la adaptación del programa autoaplicable de elección vocacional Self-Directed Search de John L. Holland. [A preliminary study for adaptation of the Self-Directed Search by John L. Holland.] *Revista Española de Orientación y Psicopedagogía*, 10(18), 353-368. Accessed from <http://www.uned.es/reop/pdfs/1999/10-18-2---353-Jose%20Manuel%20Martinez.PDF>
- Martínez-Vicente, J.M. (2001). Estudio Adaptación del Self-Directed Search Form R (SDS) y del Position Classification Inventory (PCI) a la población española. [Study for adapting the Self-Directed Search Form R (SDS) and the Position Classification Inventory (PCI) to the Spanish population.] Almería: Servicio de publicaciones de la Universidad de Almería. Accessed from <http://www.investigacion-psicopedagogica.org/revista/new/ContadorArticulo.php?166>
- Martínez-Vicente, J.M. & Valls Fernández, F. (2001). Validez transcultural del modelo hexagonal de personalidad propuesto en la teoría tipológica de elección vocacional de John Holland. [Cross-cultural validity of the hexagonal personality model in John Holland's typological theory of vocational choice.] *Revista de Psicología General y Aplicada*, 54(4), 577-586.
- Martínez-Vicente, J.M., Valls, F. & Álvarez, J. (2006). La personalidad y conducta vocacional. [Personality and vocational behavior.] In F. Rivas (Ed.), *Asesoramiento vocacional: Teoría, práctica e instrumentación* (pp. 279-311). Barcelona: Ariel.
- Martínez-Vicente, J.M. & Valls Fernández, F. (2006). La elección vocacional y la planificación de la carrera. Adaptación española del Self-Directed Search (SDS-R) de

- Holland. [Vocational choice and career planning. A Spanish adaptation of Holland's Self-Directed Search (SDS-R)]. *Psicothema*, 18, 1, 117-122.
- Martínez-Vicente, J.M. (2007). Vocational and career counseling using the Self-Directed Search (SDS). *Electronic Journal of Research in Educational Psychology*, 5(1), 233-258. Accessed from <http://www.investigacion-psicopedagogica.org/revista/new/english/ContadorArticulo.php?166>
- Martínez-Vicente, J.M. & Valls Fernández, F. (2008). Aplicación de la Teoría de Holland a la clasificación de ocupaciones: Adaptación del Inventario de Clasificación de Ocupaciones (ICO). [Application of Holland's theory of occupation classification: adapting the Occupational Classification Inventory.] *Revista Mexicana de Psicología* 25(1), 151-164.
- Mudarra, M.J. (2003). *Propuesta de un Sistema de Autoevaluación de Áreas Profesionales para la Orientación de la Carrera*. [Proposal of a self-assessment system of vocational areas for career guidance.] (Doctoral thesis). Madrid: UNED.
- Mudarra, M.J. (2007). El Sistema de Autoevaluación de Áreas Profesionales: un instrumento de diagnóstico y Orientación profesional. [The self-assessment of vocational areas system: an instrument for vocational diagnosis and guidance.] *Educación XXI*, 10, 195-213. doi: <http://dx.doi.org/10.5944/educxx1.1.10.303>
- Porter, S.R. & Umbach, P.D. (2006). College major choice: An analysis of person-environment fit. *Research in Higher Education*, 47, 429-449. doi: 10.1007/s11162-005-9002-3
- Raymond Ting, S. (2009). A preliminary study on the effectiveness of the Chinese Career Key online. *The Career Development Quarterly*, 58- 77-81. doi: 10.1002/j.2161-0045.2009.tb00176.x
- Repetto, E. (1999). *Tu futuro profesional*. [Your professional future.] Madrid: CEPE.
- Romero, S. (1997). De gira hacia el trabajo: Programa A.D.V.P. de Desarrollo de Carrera. [On tour towards work: ADVP Program for Career Development.] *Comunidad Educativa*, 240, 30-33.
- Romero, S. (2000). *De gira hacia el trabajo. Guía del profesorado*. [On tour towards work: Teacher's guide]. Granada: Aljibe.
- Rivas, F. & López, M.L. (2003). *Sistema de Autoayuda y Asesoramiento Vocacional Revisado (SAAV-R)*. [System for self-help and vocational counsel, revised.] Madrid: EOS.
- Santana Vega, L., Feliciano, L. & Cruz, A. (2010). El Programa de Orientación Educativa y Sociolaboral: Un instrumento para facilitar la toma de decisiones en Educación

- Secundaria. [The educational and socio-labor guidance program: an instrument for making decisions in secondary education.] *Revista de Educación*, 351, 73-105. Accessed from http://www.revistaeducacion.mec.es/re351/re351_04.pdf
- Savickas, M.L. & Gottfredson, G.D. (1999). Holland's Theory (1959-1999): 40 years of research and application. *Journal of Vocational Behavior*, 55(1), 1-5. doi: 10.1006/jvbe.1999.1694
- Savickas, M.L., Taber, B. & Spokane, A. (2002). Convergent and discriminant validity of five interest inventories. *Journal of Vocational Behavior*, 61(1), 139-184. doi: 10.1006/jvbe.2002.1878
- Skinner, Q. (1988). *El retorno de la gran Teoría en las Ciencias Humanas*. [The return of the Great Theory in human sciences.] Madrid: Alianza.
- Smart, J.C. (2010). Differential patterns of change and stability in student learning outcomes in Holland's academic environments: the role of environmental consistency. *Research in Higher Education*, 51, 469-482. doi:10.1007/s11162-010-9163-6
- Spranger, E. (1929). *Formas de vida. Psicología y ética de la personalidad* (1st ed). Madrid: Revista de Occidente.
- Spranger, E. (1928). *Types of Men*. Translation by P. J. W. Pigors; New York: G. E. Stechert Company.
- Tokar, D.M. & Swanson, J.L. (1995). Evaluation of the correspondence between Holland's Personality Typology and the Five-Factor Model of Personality. *Journal of Vocational Behavior*, 46, 89-108. doi: 10.1006/jvbe.1995.1006
- Tracey, T.J.C. & Robbins, S.B. (2006). The interest-major congruence and college success relation: a longitudinal study. *Journal of Vocational Behavior* 69, 64-89. doi: 10.1016/j.jvb.2005.11.003
- Valls, F. (1996). *Programa Autoaplicable de Orientación Vocacional*. [Self-applied vocational guidance program.] Almería: Universidad de Almería.
- Valls, F. (2007). Emotional intelligence and vocational/career counseling: uses and abuses. *Electronic Journal of Research in Educational Psychology*, 5(1), 179-200. Accessed from <http://www.investigacion-sicopedagogica.org/revista/new/english/ContadorArticulo.php?162>.

[This page intentionally left blank]