

Discriminant Analysis in Career Studying “Decision/Indecision”: The Career Factors Inventory (CFI) as a Diagnostic Measure.

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Literature has shown that, nowadays, a multidimensional approach to decision-making has become prioritized. The Careers Factor Inventory (CFI) is, in fact, a multidimensional measurement instrument for evaluating career indecision, which may be useful in the diagnosis of adaptation behaviors in terms of career decision versus indecision. This study emerges as a follow-up to a previous study which used the CFI on a sample of university students in which this measurement instrument was found to be capable of distinguishing *Low decided* vs. *Highly decided* groups and to evaluate the discriminatory capacity of the CFI scales. It is the aim, here, to further analyse the results obtained in such study with a view to grounding the importance of the use of this Inventory as an instrument for distinguishing people who present different decision levels in relation to their careers. In this study, 494 university students from a number of higher education establishments and courses are part of the afore mentioned *Low decided* and *Highly decided* groups. The collected data were analysed by means of Discrete Discriminant Analysis models and corroborate the discriminant power of the Inventory and its use as a diagnostic instrument in the psychological intervention of career counseling and development.

Keywords: discriminant analysis, decision, personal development, diagnosis, career guidance.

La literatura muestra que, en estos días, una aproximación multidimensional de la toma de decisiones se ha vuelto prioritaria. El Inventario de Factor de Carreras (Careers Factor Inventory; CFI) es, de hecho, un instrumento de medida multidimensional para evaluar la indecisión en la elección de carrera, lo que puede ser útil para el diagnóstico de conductas adaptativas en términos de decisión versus indecisión en la elección de carrera. Este estudio emerge como continuación de un estudio previo que utilizó el CFI en una muestra de estudiantes universitarios en la que éste instrumento de medida ha sido capaz de distinguir entre grupos de *Baja decisión* vs. *Alta decisión*, y para evaluar la capacidad discriminadora de las medidas CFI. El objetivo aquí es continuar analizando los resultados obtenidos en ese estudio con vistas a determinar la importancia del uso de este Inventario como instrumento para distinguir a las personas que presenten diferentes niveles de decisión en relación a sus carreras. En este estudio, 494 estudiantes de diversos cursos de instituciones de educación superior son parte de los grupos ya mencionados *Baja-decisión* y *Alta-decisión*. Los datos recogidos fueron analizados mediante el modelo de Análisis Discriminante Discreto y corroboran el poder discriminante del Inventario y su uso como instrumento diagnóstico en la intervención y psicológico de la elección de carrera y la orientación vocacional.

Palabras clave: análisis discriminante, decisión, desarrollo personal, diagnóstico, orientación vocacional.

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Although a number of authors have generally tended to place more emphasis on the cognitive rather than affective dimension, it seems to be consensual that both aspects take on an important role in career indecision experience. Indeed, literature has revealed that the issue of indecision is multifaceted and complex.

Although this theme may be addressed within a number of scientific fields, the study of indecision has become widely known among researchers and professionals interested in acquiring a more comprehensive vision of vocational behavior and of diversifying intervention modalities within this context (Osipow, 1999; Silva, 2004).

Having originally focused on the issue of decision-making among students, particularly towards the end of adolescence and early adulthood, the question of career indecision currently covers other phases of one's active life cycle, as career re-planning in contemporary societies seems to be necessary among such increasing diversity in life changes, thus, giving rise to moments of indecision (Osipow, 1999).

Decision-making is a complex process which can often be a difficult and confusing task for many people. Despite the fact that some individuals apparently make decisions easily, others are confronted with difficulties when making their career decisions (Gati, Krausz & Osipow, 1996), stemming from interventions related to their need to make a specific decision- the choice of a "career" is one of the most important decisions anyone can face and it is crucial that individuals are given all the help they need (Lima & Gouveia, 2003). According to Gati, Krausz and Osipow (1996), one of the main aims of career counseling is, precisely, to facilitate the decision-making process and, particularly, to help individuals overcome the difficulties with which they are confronted throughout this process. Thus, the main goals of counseling in situations characterized by career indecision seem to tie in with the diagnosis of indecision-related factors and the identification of personal strategies, which allow people to handle their choices in a more adaptative manner and to implement their decisions more satisfactorily, so as to trigger well-being.

Despite the fact that the indecision phenomenon is experienced in a very personal and different way from one person to another, Santos and Coimbra (2000) are of the opinion that there is a relative consensus in the distinction between *simple or developmental indecision*, which "corresponds to a normal phase of exploring alternatives, in developmental terms" and *chronic or generalized indecisiveness* which "reflects difficulties in the decision-making process in other aspects of the individual's life" (p. 348). According to Feldman (2003), developmental indecision (of a broadly cognitive nature) occurs due to a lack of information and, in general, decreases as the individual acquire greater self-knowledge and feedback from the environment. Chronic indecision (of a broadly affective nature), is, on the other hand, affected by

continuous anxiety and fear of commitment, tending to stabilize in individuals over time. Osipow (1999) seems to adopt a slightly different terminology to refer to both types of indecision. This author proposes a distinction between *indecision* and "*indecisiveness*". Indecision is regarded as a normal state or process of human development, in other words, as a developmental phase experienced by individuals in order to come to a decision. Therefore, it corresponds to developmental indecision, a state which comes and goes over time as decisions are made, implemented, become obsolete and eventually lead to a need for a new decision (producing a temporary state of indecision). "*Indecisiveness*" is viewed as a trait that is generalized to situations requiring decisions. The individual has difficulty in making career and other decisions, to the point where the main goal is not accomplished in time to implement appropriate behavior (thus, corresponding to chronic indecision). One of the issues raised by research regarding career indecision measures is related to the dimensionality of this construct, whereby a multidimensional approach to decision-making is prioritized by means of comprehensive models which use both cognitive-informational and emotional-affective factors to explain the complexity of the human decision process (Silva, 1997). The Career Factors Inventory (CFI) used in this study, is a multidimensional measurement instrument for evaluating career indecision, and may be considered useful in the diagnosis of student adaptation behaviors, as far as career indecision is concerned. Indeed, the latter is one of the most frequently analysed problems studied in Guidance Psychology, and is of fairly high importance in terms of intervention (Silva, 1994).

This article has emerged as a follow-up from a study (Lima, Sousa Ferreira & Doria, 2004) performed with the Career Factors Inventory – CFI (Chartrand, Robbins, Morrill, & Boggs, 1990), whereby the analysis provided by the above mentioned measurement instrument was supported by a research study in guidance and career development psychology with university students (Lima, 1998). It was during this study that it was possible to verify the ability of the CFI to distinguish between groups of *Low decided vs. Highly decided*, defined *a priori* on the basis of the overall result obtained in the Vocational Identity of the questionnaire My Vocational Situation– MSV (Holland, Daiger, & Power, 1980). Furthermore, the discriminative ability of the CFI scales was evaluated, and conclusions suggested that these scales could be organized in decreasing order on the basis of the discriminative ability between the afore mentioned decision/indecision groups.

This research study sets out to analyse the items of the scales belonging to this psychological evaluation instrument, with recourse to a number of discriminative analysis models on qualitative variables (Sousa Ferreira, 2000). Thus, it is our aim to perform an in-depth analysis of the obtained results, in terms of the use of the CFI as a discriminative instrument of individuals with different

career decision levels, as well as a diagnostic instrument in psychological intervention in relation to guidance and career development. The latter takes on even greater significance, particularly if we consider the students who do not show evidence of having received any support in their decision-making, obliging the counselor to intervene more on a remedying rather than preventive basis (Lima, 2005).

Method

Participants

In order to evaluate the discriminative power of the Career Factors Inventory (Chartrand et al., 1990) among students with different career decision levels, the aforementioned sample of university students ($n = 1204$) covered by the research study in the psychology of guidance and career development (Lima, 1998) was considered.

Based on the results obtained by the students (1st and 2nd years of several higher education courses and establishments) in the Identity Vocational Scale of the questionnaire My Vocational Situation (Holland et al.,

1980), the calculation of Percentiles 25 and 75 was carried out, with the respective values of 8 and 14, on a scale where the gross results lie between 0 and 18. Thus, two groups were defined *a priori*: the *Low decided* (below the 25th Percentile) and the *Highly decided* (above the 75th Percentile).

The above mentioned groups, defined *a priori* as *Low decided* and *Highly decided* are made up of 252 and 242 students, respectively, from the 1st and 2nd years of several higher education courses and establishments. The *Low decided* students have a higher percentage of males (50.4%) while the *Highly decided* students have more females (57%). As for age, the *Low decided* group is slightly younger and homogeneous ($M = 19.50$, $SD = 2.73$) than the *Highly decided* group of students ($M = 21.70$, $SD = 6.41$).

The splitting of the students into both groups *a priori* throughout the various courses is fairly similar, with the exception of Electrotechnical and Computer Engineering, where the number of students is considerably higher among the *Low decided* group, as may be observed in the bar chart of Figure 1.

As regards the work/employment situation of the students in the sample, the groups seem to reveal some

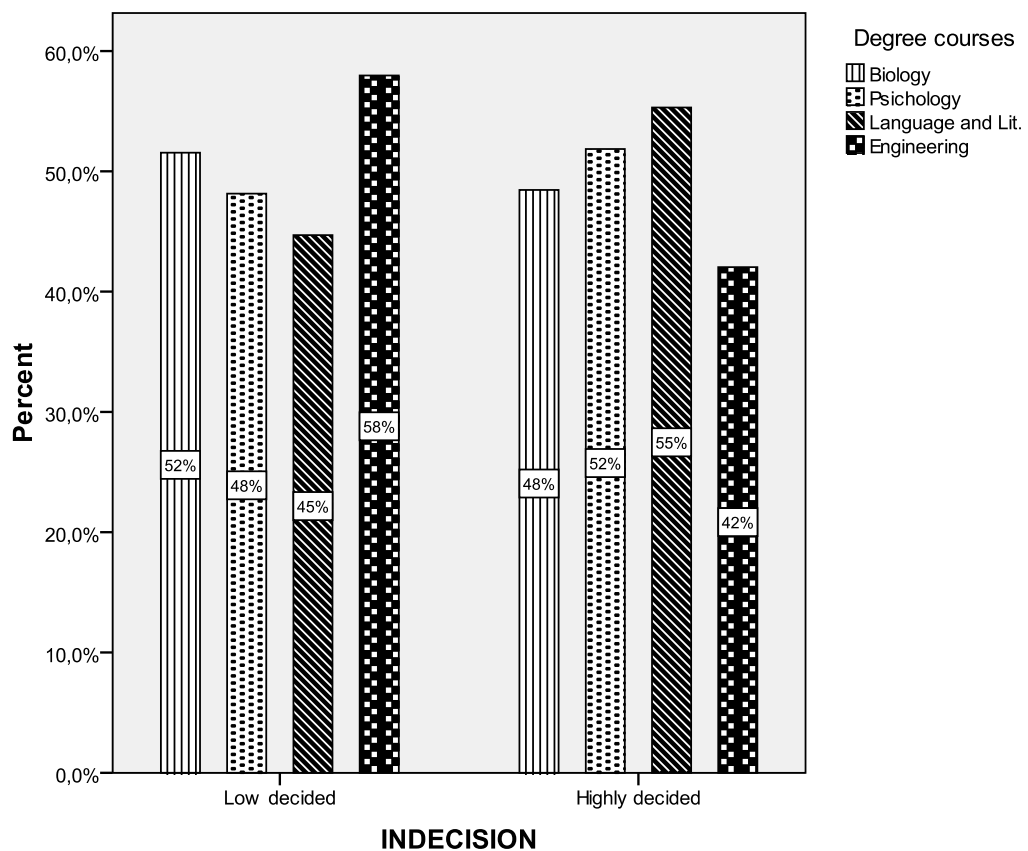


Figure 1. Bar chart of student distribution by group and course.

important differences since although in both groups the vast majority of students are not employed or in search of employment, there are more who work full or part time among the *Highly decided* students, as one may note in Figure 2.

Instrument

The instrument Career Factors Inventory (CFI) was the measurement instrument used, and its name was adopted in the adaptation carried out in a research study with university students (Lima, 1998) and authorized by Judy M. Chartrand, in representation of the Department of Psychology of “Virginia Commonwealth University”.

The Career Factors Inventory is considered one of the so-called “second generation” measurements, constructed to adapt to a multidimensional model of career indecision. The original five component career indecision model, resulting from the literature review was not corroborated by a process that used confirmatory factor analysis. The authors opted for a more parsimonious model made up of four factors. This analysis gave rise to the current form of the Inventory to include four factors and twenty one items,

with a view to a differential diagnosis of career indecision (Lewis & Savickas, 1995). The Career Factors Inventory (Chartrand et al., 1990), thus, contains two information and two personal and emotional factors. From a practical perspective, the aim was to create an instrument with a solid structure of multiple factors, only containing items representative of each factor. The authors carried out a revision of the Career Decision Scale (CDS) and Vocational Decision Scale (VDS), taking three developmental stages of the instrument’s development and revision into consideration: a summary of the Inventory’s initial development, the presentation of four confirmatory factor analyses and the results of several validity and reliability analysis (Chartrand et al., 1990).

One of the five initially proposed scales (Self-Esteem) was eliminated, due to the fact that the items’ saturation was based on a number of factors, thus, being inconsistent with the goal to develop homogeneous content measures. So, the four scales which are part of the Inventory are *Career Choice Anxiety*, *Generalized Indecisiveness*, *Need for Career Information* and *Need for Self-Knowledge*, and are regarded as being well defined and stable given the samples used in the study (Chartrand et al., 1990).

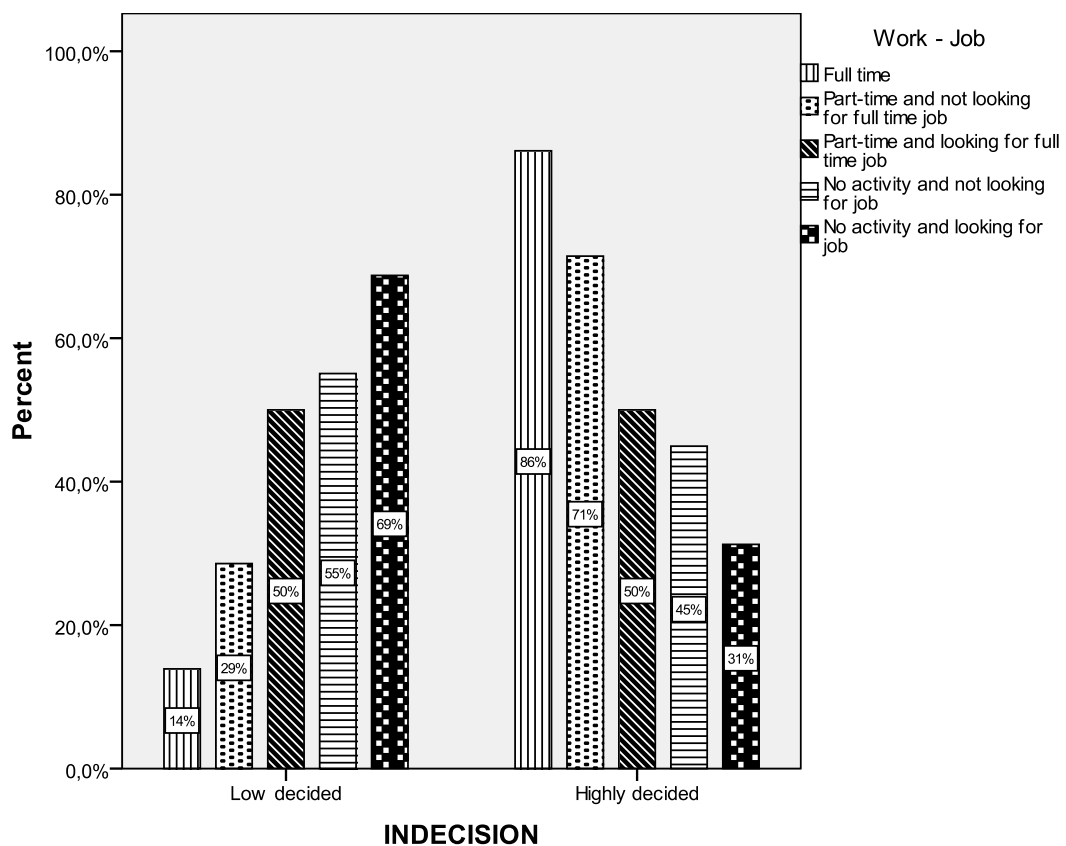


Figure 2. Bar chart of the student distributions by group and situation in the work-job.

The high correlations of the scales may raise some concern as to their distinction; however, this issue is inconsequential due to the fact that the items are all concentrated into one factor. The correlations obtained among the factor scales were much lower than those estimated by the second confirmatory factor analysis. On the other hand, the concurrent validity proved to highlight the independence of the scales –for example, goal instability has a higher correlation with the scale *Generalized Indecisiveness* than with the scales *Career Choice Anxiety*, *Need for Self-Knowledge* or *Need for Career Information*. The methodology of the confirmatory factor analysis was adopted by providing the specification and further testing of the relation structure among the variables of the Career Factors Inventory, in accordance with the theoretically foreseen model. However, measurement of the characteristics and construct validity of the Inventory were evaluated separately. Results indicated that the instrument provided very precise and credible measurements and repetition of the results obtained from a separate sample reinforced its trustworthiness in the stability of its factorial structure. The comparison between the 4 factor model with the 1 or 2 factor model stressed higher credibility of the former, and the discriminant analysis results indicated that the four scales could distinguish the groups with high and low levels of indecision perfectly well (Chartrand et al., 1990).

As in the original, the Career Factors Inventory includes 21 items, each contributing to one single scale. Thus, the sum of items 7, 8, 9, 10, 11 and 12 supplies the result of the scale *Career Choice Anxiety*, defined as the expressed anxiety level linked to the process of vocational decision-making; the sum of items 4, 5, 6, 18 and 19 provide the result of the scale *Generalized Indecisiveness*, defined as an individual's inability to make decisions, even when there are conditions for such to occur. Thus, high indecision level here represents shortcomings in the formulating decision competency; the sum of items 1, 13, 14, 16, 20 and 21 represents the result of the scale *Need for Career Information*, defined as a perception measurement for the need to acquire factual data and experience in terms of the various professions, which is a priority as far as career decision-making processes are concerned; the sum of items 2, 3, 15 and 17 is the result of the scale *Need for Self-Knowledge*, defined as an individual's need to self-define him/herself and to discover. Someone with weak self-knowledge may have a confused identity, with a weak definition of personal characteristics, such as skills and interests. It is also possible to obtain the total result of the Career Factors Inventory (CFI) by adding the results of all four scales.

The translation and classification process were based on the original, where participants answered on a sheet including the instructions, to which only one example was added in order to be more explicit in terms of how to answer

and, before the instructions, a space was left for name and gender. Participants were asked to circle their option, ranging from 1 to 5, which were expected to best define what they felt in relation to the item in question.

Answers to the items vary according to the respective content and meaning attributed to the extremes of the scale -1 and 5. Indeed, while in items 4, 5, 6, 7, 8, 9, 10, 11, 12, 18 and 19 (*Career Choice Anxiety and Generalized Indecisiveness*) the extremes are generally conveyed through adjectives (e.g.: difficult/easy or anxious/calm), in items 1, 2, 3, 13, 14, 15, 16, 17, 20 and 21 (*Need for Career Information and Need for Self-knowledge* scales) the terms "I totally disagree" and "I fully agree" are those that correspond to the extremes, 1 and 5. It should be noted that in order to classify items 4, 6, 7, 8, 9 and 10 the results (i.e. $5 = 1$, $4 = 2$) have to be converted, since the adjectives in question call for an inverted reading, due to the meanings attributed to the scales' extremes.

As with other studies, in the above mentioned research, the reliability coefficients in the CFI were high (confirmed by the precision analysis through item-scale correlations and Cronbach's Alpha calculation), ranging from between .73 and .86 in the total sample, between .70 and .86 in the 1st year sample and between .75 and .86 in the 2nd year sample (Lima, 1998).

Analysis of the intercorrelations of scales in the CFI highlights a higher relation between the scales connected to the information factor (*Need for Career Information and Need for Self-knowledge*) and between the scales more connected to the personal and emotional factor (*Career Choice Anxiety and Generalized Indecisiveness*). In the set of samples, the scales connected to need for information appear to be related in a different way, stressing the relation between *Need for Self-knowledge* and the personal and emotional scales (*Career Choice Anxiety and Generalized Indecisiveness*).

Despite the fact that the factor analysis was not carried out on the items, the structure itself pointing out two factors, each one associated with the interrelated scales. In other words, on the one hand the information factor scales, and on the other the personal and emotional scales. So, the Principal Component Analysis (PCA) highlighted two factors that explain approximately 75% of the results' variability, in which the former is associated with the scales *Need for Career Information and Need for Self-knowledge* and the second factor with the scales *Career Choice Anxiety and Generalized Indecisiveness*.

Procedure

Discriminant analysis is the term given to a set of multivariate data analysis techniques which are applied when populations are partitioned into groups *a priori*, described by explicative (or predictive) *p* variables. The aim of these methods is to construct a decision rule which

will enable the future prediction of a group *a priori* to which new observed individuals belong (anonymous individuals) as well as an understanding of the predictive ability of the explanatory variables taken into consideration.

In the previously developed study (Lima et al., 2004) Discriminant Factor Analysis (DFA) methods were applied, geared primarily towards evaluating whether the CFI instrument could differentiate/distinguish the groups of university students with low and highly of decision. As is commonly known, the discriminant analysis technique sets out to find factors where the values are quite different for individuals belonging to distinct groups and similar for those belonging to the same group (Sousa Ferreira, 1987). In this study, the DFA was used fundamentally from an explicative perspective, with a view to discovering the most important CFI scales to distinguish the groups defined *a priori*. Thus, an ascending stepwise method based on Mahalanobis distance was used to find the subset of variables/scales that guarantee higher distinction levels, while adding, at each step, a new variable/scale to the subset obtained in the previous step.

The obtained results are set out in Table 1, where the *prior* probabilities groups were considered equal and the results of the scales are presented in decreasing order of their predictive ability. The percentages of students correctly classified in the global group and in each of the groups defined *a priori* are estimated by cross-validation. Figure 3 we have presented a boxplot as we believe it complements the information of the discriminant analysis method, enabling us to understand its importance in the differentiation/distinction of the groups. In this case, a considerable differentiated behavior of both groups *a priori* may be noted, as far as the scales of the CFI instrument are concerned.

In this study, Discrete Discriminant Analysis (DDA) techniques were applied since they are well adapted to the measurement scale of the CFI scale items. The DDA methods were used fundamentally from an explicative perspective, with a view to discovering the more important items for differentiating/ distinguishing the *Low decided* from the *Highly decided* students. A comparative study

of the results obtained with the various DDA techniques was carried out between the two groups defined *a priori*, namely the First-Order Independence Model (FOIM) and the Dependence Trees Model (DTM) (Brito, Celeux, & Sousa Ferreira, 2006; Celeux & Nakache, 1994; Sousa Ferreira, 2000). Both these models take into account the information stemming from the underlying structure of the data in a differentiated way as regards the nature of the relation among the qualitative variables: the former is based on the assumption of independence among the variables within groups, while the latter takes interaction among the variables into consideration.

Unlike the quantitative case, the selection methods of the best predictive variables in DDA are not easy to define. However, in the FOIM model, a naturally excellent selection method of the variables under study emerges, in perfect harmony with the constructed decision rule (Celeux & Nakache, 1994). In order to discover the predictive power of the several predictive variables, one needs only to analyse the relation between the group variable and each one of them, by means of the well known statistical chi-square test:

$$\chi^2 = \sum_{i=1}^2 \sum_{j=1}^c \frac{(n_{ij} - e_{ij})^2}{e_{ij}},$$

in which n_{ij} is the frequency observed in group i and in the variable j and e_{ij} is the expected frequency for group i and in the variable j under the independence assumption.

Thus, the results of the item analysis by the FOIM model may be presented in a decreasing order of its predictive ability.

The statistical programs used in this study were implemented by Sousa Ferreira (Brito et al., 2006; Sousa Ferreira, 2000) in FORTRAN[®] 77 Language, in accordance with the Microsoft FORTRAN Optimizing Compiler Version 5.0 and can be uploaded.

Table 1
Discriminant Factor Analysis Results among the Low decided and Highly decided groups of students

Step n ^o	Scale	% of globally correctly classified	% of generally correctly classified <i>Low decided</i>	% of generally correctly classified <i>Highly decided</i>
1	<i>Generalized Indecisiveness</i>	74.90	69.00	81.00
2	<i>Need for Self-knowledge</i>	78.30	79.40	77.30
3	<i>Career Choice Anxiety</i>	80.60	82.10	78.90
4	<i>Need for Career Information</i>	81.60	82.90	80.20

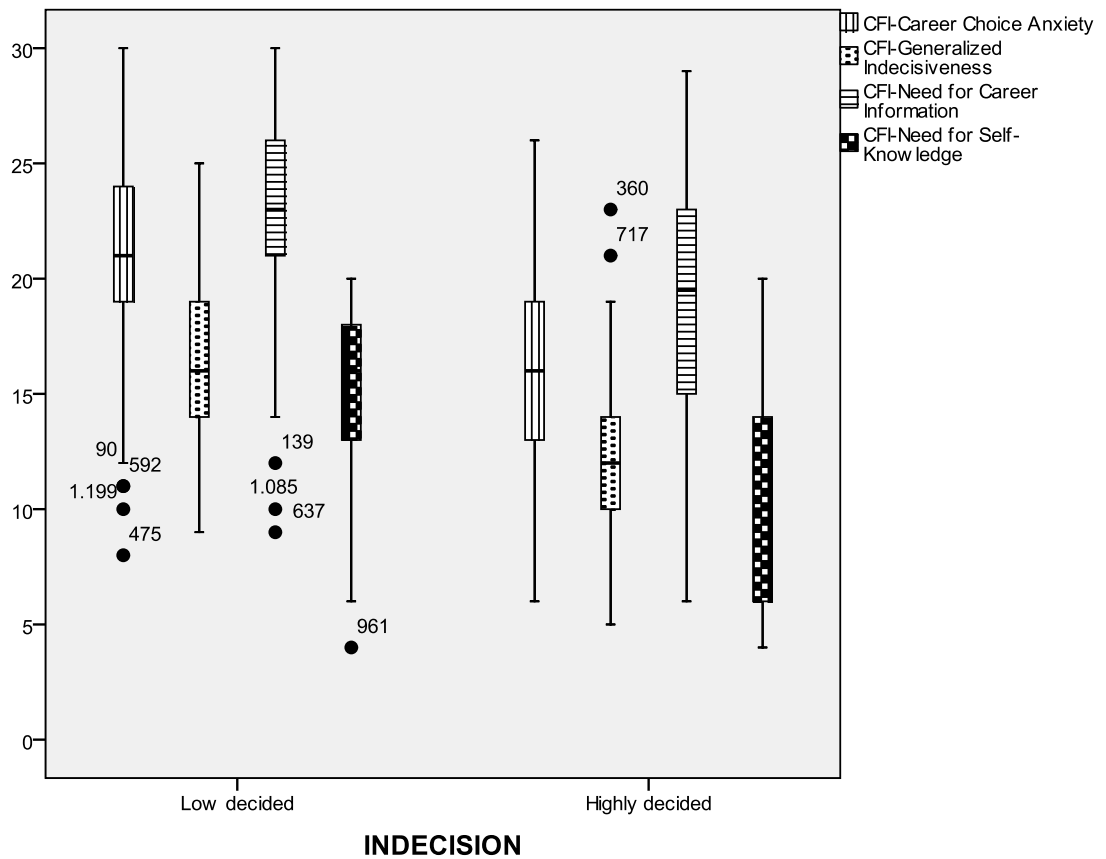


Figure 3. Boxplot of groups comparison in CFI scales.

Results

In the second stage of the data analysis, when we analysed the items of the CFI, among the various models used, the FOIM model indicated better predictive ability, bringing together good decision performance and an explicative perspective. The *prior* probabilities groups were considered to be equal. The results of the scales and items are presented in Table 2 in decreasing order of their predictive ability and the percentages of students correctly classified in the global group and in each group defined *a priori* were estimated by cross-validation.

An analysis of the DDA results corroborates the previously accomplished study (Lima et al., 2004), highlighting the fact that the scale with the lowest discriminative ability between the groups of *Low decided* and *Highly decided* students is the *Need for Career Information*. The fact that individuals in this scale are confronted with more objective and factual information (example: employment opportunities, training...), where updating is always important, may make the need for this

type of information more “independent” in relation to career decision.

Therefore, and on the basis of the CFI scale intercorrelation test, in which a higher relation among the scales linked to the Information factor and among the scales that are more connected to the personal and emotional factor (Chartrand et al., 1990; Lima, 1998) is displayed, one may say that the *Generalized Indecisiveness* and *Career Choice Anxiety* scales favorably distinguish the *Highly decided* individuals, while the *Need for Self-knowledge* and *Need for Career Information* distinguish the *Low decided* individuals.

It should also be noted that in terms of the items (see Table 2), the *Generalized Indecisiveness* and *Career Choice Anxiety* scales seem to have higher predictive ability for the *Highly decided* group of students, while the items of the *Need for Self-knowledge* and *Need for Information* scales seem to better acknowledge the *Low decided* students. The fact that the scales connected to the need for information emerged as being related in a different way, underlining the relation between *Need*

Table 2
Discrete Discriminant Analysis Results among the Low decided and Highly decided groups of students

Scale	Items	% of globally correctly classified	% of generally correctly classified <i>Low decided</i>	% of generally correctly classified <i>Highly decided</i>
<i>Generalized Indecisiveness</i>	19	75.30	71.00	79.80
	4			
	6			
	5			
<i>Need for Self-knowledge</i>	18	76.30	85.70	66.50
	2			
	15			
	17			
<i>Career Choice Anxiety</i>	3	75.90	74.20	77.70
	7			
	8			
	9			
	12			
<i>Need for Career Information</i>	11	69.40	79.40	59.10
	10			
	16			
	1			
	21			
	14			
	20			
	13			

for *Self-knowledge* and the scales of the personal and emotional factor (Lima, 1998), such results remain in line with this present analysis which highlights the *Need for Career Information* as the scale with the lowest discriminative ability between the two groups of students.

In a more detailed analysis of the importance of the items in the various scales, it may be noted that in each one, a decreasing order of the predictive ability of the items presented in Table 2 is justifiable, taking the analysis of content and the meaning each item contributes to each one of the CFI scales into consideration. Therefore, and considering only the first two items, in the *Generalized Indecisiveness* scale the items related to security vs. insecurity and difficulty vs. facility in decision-making stand out, and, in the *Career Choice Anxiety* scale the items related to feelings of being fearful vs. courageous and tense vs. calm stand out when the individual really has to make a decision involving his/her future career. All in all, these items are conveyed by adjectives whose meaning may be indicative of when someone feels indecisive and in need of help so as to clarify decision-making related doubts – feeling insecure, believing it to be hard to make a decision,

feeling fear and tension. In the *Need for Self-knowledge* scale, the most prominent items are related to “who I am” and “what kind of person I would like to be” before choosing or entering a specific area of activity”, both more related to identity in comparison with items of the same scale that refer more to what is most important for the individual. As far as the *Need for Career Information* scale is concerned, the main items are “before choosing or entering a specific area of activity, I still need to consider my leisure activities and school education to help me determine what kind of career may satisfy me and which one I can perform well in” and “before choosing or entering a specific area of activity, I still need to speak to people from one or two occupations”. In this case, higher priority is given to information regarding the roles of Study and Leisure and the use of professionals as a source of information in comparison with a different, more specific type.

The following figures complement the information provided by the discriminant analysis methods, clearly illustrating the differentiated behavior of some of these items in the groups *a priori*.

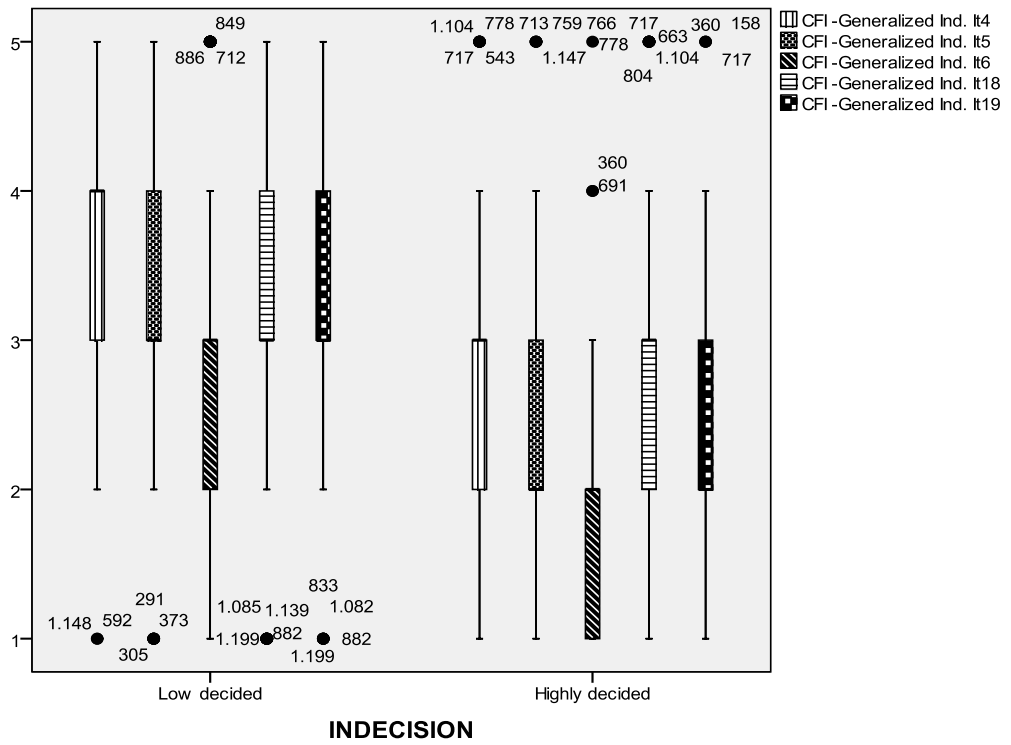


Figure 4. Boxplot of group comparison in Generalized Indecision items.

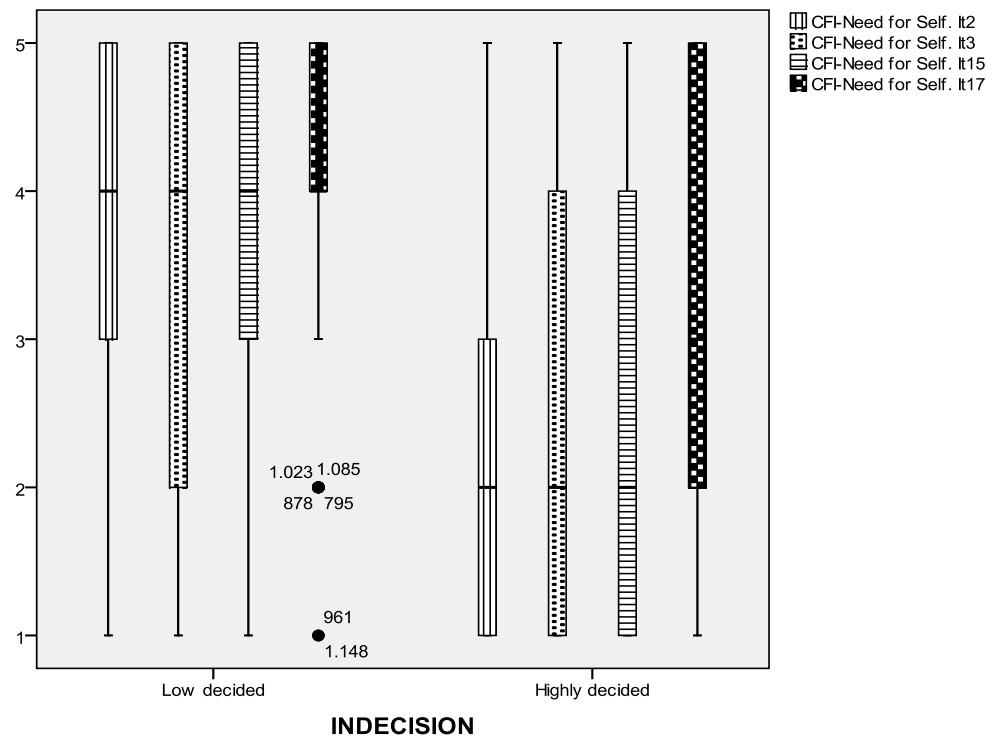


Figure 5. Boxplot of group comparison in the Need for Self-Knowledge items.

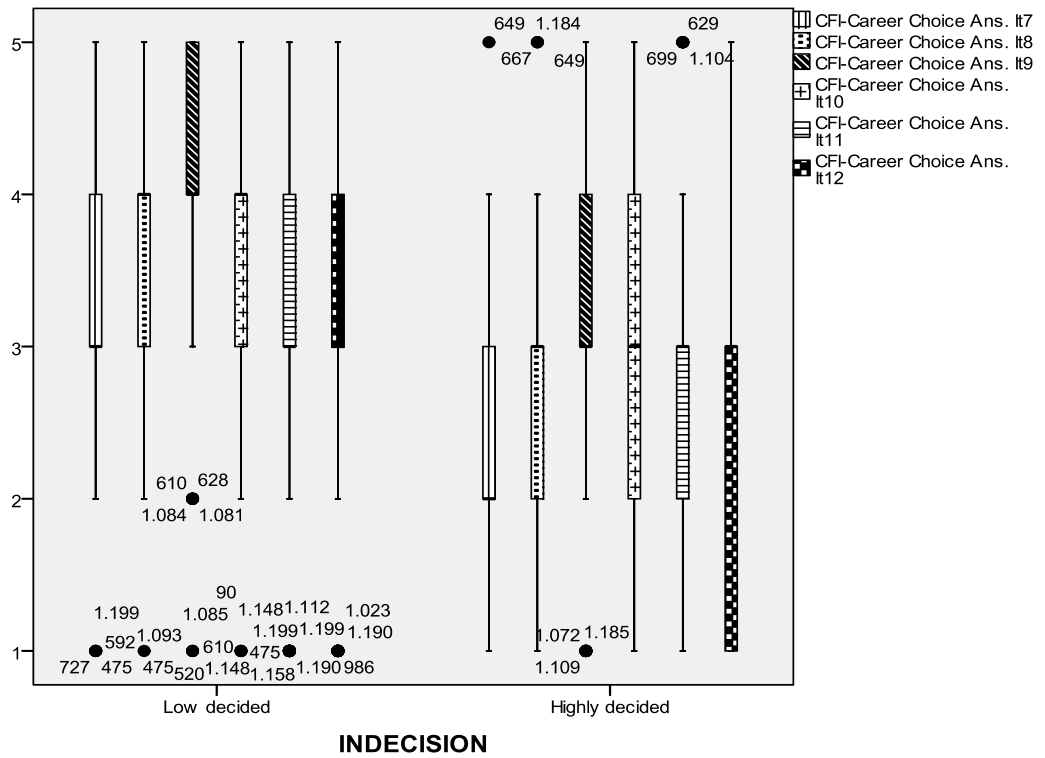


Figure 6. Boxplot of group comparison in the Career Choice Anxiety items.

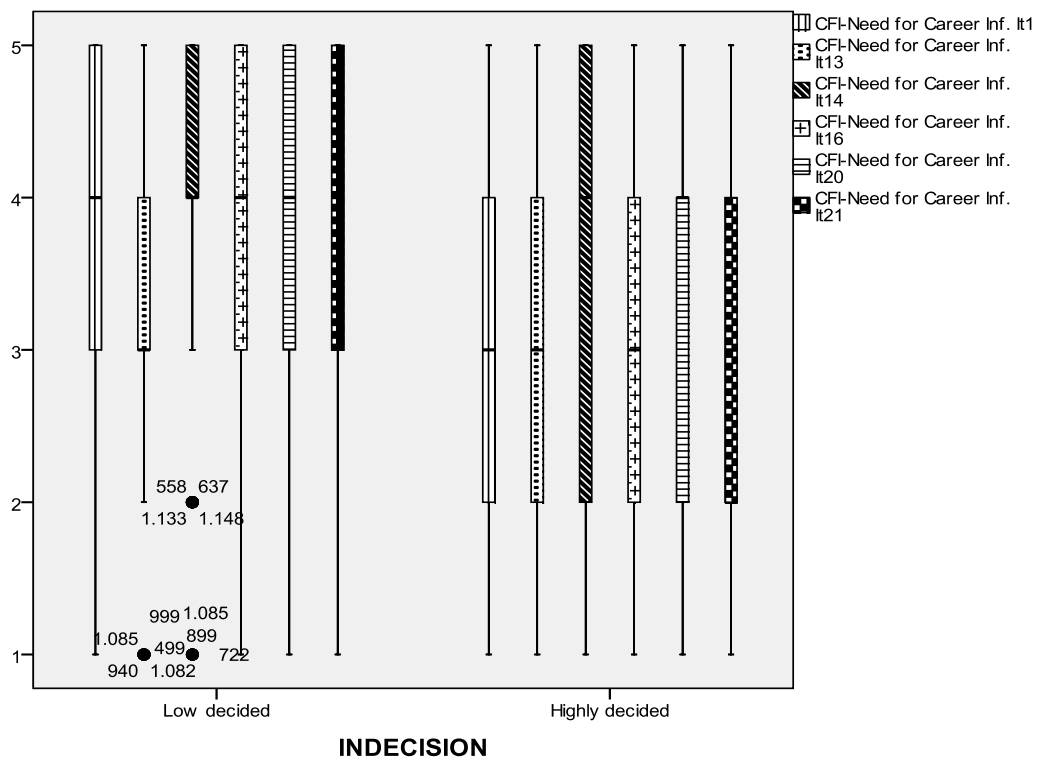


Figure 7. Boxplot of group comparison in the Need for Career Information items.

We may note that the items in the *Generalized Indecisiveness* scale (Figure 4) display similar behavior within each group, with the exception of item 6, and values of higher concordance are always observed within the group of *Low decided* students.

As for the items of the *Need for Self-knowledge* scale (Figure 5), the differentiated behavior of its items in the two groups is clear enough, and always indicates a median value of 4 in the *Low decided* group against a value of 2 or 3 in the other.

By comparing the values observed for the items of the *Career Choice Anxiety* scale (Figure 6), we noted that the *Low decided* students tend to agree more in their answers than the others, as the values of the extremes and quartiles clearly indicate.

In the *Need for Career Information* scale (Figure 7), we once again observed the answer tendency in all the previous scales: the students from the *Highly decided* group always give more discordant answers.

The tendency for the *Low decided* groups to get higher marks than the *Highly decided* groups is to be expected,

Table 3

Comparative results of the Career Factors Inventory (CFI) results among low decided and highly decided groups of students

Items	Student Groups									
	<i>Low decided</i>					<i>Highly decided</i>				
	%					%				
	1	2	3	4	5	1	2	3	4	5
<i>Generalized Indecision</i>										
Item 4	1	16	29	34	20	7	43	40	8	3
Item 5	2	13	43	33	9	13	37	34	14	2
Item 6	9	29	43	13	6	36	40	22	1	0
Item 18	0	8	33	47	12	7	27	48	17	1
Item 19	2	4	19	50	26	6	19	39	29	7
Median and Interquartile range			16 (5)					12 (4)		
<i>Need for Self-knowledge</i>										
			%					%		
Item 2	6	17	23	22	31	43	23	13	11	10
Item 3	9	18	21	26	26	35	23	15	15	14
Item 15	6	9	19	31	35	35	24	11	19	11
Item 17	1	4	10	35	50	21	18	11	23	26
Median and Interquartile range			16 (5)					10 (8)		
<i>Career Choice Anxiety</i>										
			%					%		
Item 7	2	12	36	36	14	17	50	27	6	0
Item 8	0	8	33	47	12	7	27	48	17	1
Item 9	2	4	19	50	26	6	19	39	29	7
Item 10	2	9	29	44	16	8	24	31	28	9
Item 11	10	6	48	24	12	22	17	47	12	3
Item 12	10	12	40	33	6	26	23	43	7	1
Median and Interquartile range			21 (5)					16 (6)		
<i>Need for Career Information</i>										
			%					%		
Item 1	1	7	24	32	37	12	21	27	23	17
Item 13	4	17	30	27	22	17	28	24	19	12
Item 14	2	5	12	37	44	10	17	16	29	28
Item 16	1	5	20	43	31	18	19	22	28	14
Item 20	4	10	17	27	43	15	16	19	28	22
Item 21	2	11	18	38	31	15	22	22	27	15
Median and Interquartile range			23 (5)					20 (8)		

since the multidimensional approach of decision-making uses factors of a cognitive-information and affective-emotional type to explain the complexity of the decision vs. indecision process. In other words, in spite of the fact that the information factor scales are those which most distinguish them, the *Low decided* individuals also have high results in the personal and emotional factor scales.

On the other hand, the fact that the scales connected to the personal and emotional factor are more discriminative of the *Highly decided* individuals may be related to the type of items in question and what is being evaluated – the level of expressed anxiety linked to the career decision-making process and the individual's inability to make decisions even when there are conditions for such. Whenever an individual feels more anxious and unable to make decisions, it is likely that despite uncertainties/doubts, he/she feels more decided when in possession of more objective information which was previously unknown and lacking to be in a position to make any kind of career decision. Thus, if the *Need for Career Information* scale evaluates the perception measurement of the need to acquire factual data and experience on what is a priority in terms of career decision-making processes, it is an information type which can only be discriminative, per se, for the *Low decided* individuals. Nevertheless, the fact that the individual feels undecided is, in itself, a sign of an absence of information regarding him/herself also (*Need for Self-knowledge*), where the well affected percentage set out in Table 2, in the *Highly decided* group (66.5%) was different and favorable to the *Low decided* group (85.7%).

Discussion

Application of the discriminant analysis method in decided and undecided individuals is the basis of psychological evaluation for those involved in career guidance and development. This is due to the fact that one of the main problems young adults generally face when confronted with the need to make a decision is, frequently, "indecisiveness".

With regard to the issue "decision-indecision", literature on the Career Factors Inventory (CFI) is indicative of an instrument that can be useful in the diagnosis of the adaptation and decision-making situation students have to face, as well as in the frequently preventive intervention of potentially problematic situations.

The Career Factor Inventory revealed a high discriminative power among university students who manifest different career decision levels, as referred to by a number of authors (Chartrand et al., 1990). This study also seems to corroborate the usefulness of this measurement instrument in the diagnosis of student adaptation behaviors in terms of "decision/indecision", thus, contributing to psychological intervention with higher education students who frequently have to deal with career decision-making problems throughout their academic lives, regardless of the

roles they play. The incidence of students with full or part time employment in the sample of this study is much higher in the *Highly decided* group of students, which may indicate that the fact they invest in different activities, such as Study and Work, may require individuals to be more capable of responding to decision-making and the development of related competencies.

If we consider that from a structural perspective the career indecision construct may be represented by three dimensions, the perceived degree of decision certainty/trust, affective and motivational difficulties (e.g., fear of making commitments, decision anxiety) and cognitive-information deficits (e.g., lack of information with regard to curricula) (Silva, 1997), we may interpret the results of this study in a different light.

Given that lack of information (e.g. on curricula and professional outlets), or rather, an information-cognitive deficit is something fairly easily rectifiable, the same can not be said when referring to difficulties of an affective and motivational nature. So, in individuals with *highly of decision*, the items from the affective-emotional scales are what better distinguish them, since being very decided should assume not only that information is not necessary, but more so having the perception of decision certainty/trust and not having difficulties of an affective and emotional nature. On the other hand, the *low decided* individuals will not be distinguished very easily by the affective-emotional factor scales, since the experience of indecision is, in itself, complex and involves difficulties which are not only much harder to resolve (e.g. fear to make commitments, decision anxiety), but also those that are more objective and which, despite contemplating the scale with the lowest discriminative ability (*Need for Career Information*), are the ones which more easily distinguish the *Low decided* group.

However, the discriminative power of the CFI, in a career counseling setting, has given rise to a more refined analysis of the results, which is also more inter-related to the data obtained in the set of applied psychological tests. Furthermore, an analysis of the items that contribute to the result of each one of the scales is a more valid tool in making the response to each individual's need for help more effective. One may even speak of career indecision behavioral patterns from a holistic perspective of psychological intervention in counseling. For instance, individuals with a great need for career and self-knowledge information and lows of career choice anxiety benefit more from a cognitive approach than those who are experiencing high anxiety and decision levels, but who have few information requirements.

On the basis of this perspective, the use of CFI has considerably enriched not only the definition of intervention strategies for counseling sessions, but also an analysis of the scenarios at the end of each intervention, thus

facilitating the clarification of each individual's personal and professional goals. In addition to this clarification, the fact that the individual is capable of facing up to his/her own needs for help may also be regarded as an asset for psychological intervention.

This study also aims to underline the use of the CFI in terms of further research developments. Evidence of the discriminative ability of the CFI scales triggered the use of this measurement instrument in a recently accomplished follow-up study (Lima & Fraga, 2008), which set out to corroborate the results obtained from a preliminary study (Fraga & Lima, 2005) in which the strategies and techniques used in psychological intervention related to career counseling proved to be favorable.

An analysis of the results obtained from this follow-up study also confirm the effectiveness of helping in the career counseling of higher education students, which is conveyed both by means of a lower level of *Career Choice Anxiety* and less of a need for career and self-knowledge information. By means of the CFI, this study seems to corroborate the use of stages in the counseling process, throughout which the need for reformulating plans and re-defining goals has frequently been revealed, and which may call for further specialized psychological support (Lima & Gouveia, 2003), regardless of the career development tasks with which students are and will be confronted.

As the CFI is capable of constituting a diagnostic instrument by enabling the differentiation of individuals' needs and by serving as a basis for the initial counseling sessions, it can also contribute to validating the preliminary interviews which are at the root of discovering the type of needs manifested by those who request help in decision-making processes. It is, therefore, also about helping the counselor to obtain a greater likelihood of success in the intervention or combination of interventions to be put into action, and to classify the diagnosis of individuals who request support in order to identify different subtypes and to evaluate the differentiated effectiveness of specific interventions.

With this perspective, psychological intervention sets out to offer a contribution to personal development, according to an approach which goes in search of understanding how individuals interpret and represent the tasks a specific context presents them with, what meaning they give to them and how they integrate such representations in their history and personal career construction (Savickas, 2005). Hence, a career is constructed as the individual accomplishes choices that express his/her self-concept and which structures his/her goals in the social reality of the work role (Savickas, 2005). It is, thus, also the role of the counselor to further analyse and improve intervention techniques, so that they are increasingly more effective, to help students in decision-making processes and styles and, consequently, in the personal development of individuals.

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