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Psychometric properties and validity of an instrument measuring lower secondary students' perceived competence in educational decision-making process

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Abstract

Making decisions about school or career is a very important task for young people since these choices can have long-term consequences. The main purpose of this study is to examine psychometric properties and construct validity of Perceived Competence in Educational Decision-making Process Questionnaire (PCEDPQ). A multi-group confirmatory factor analysis (MCFA) is performed to test the scale theoretical structure and the metric invariance across gender. Results of MCFA are consistent with the hypothesized scale structure and show measurement invariance across gender. The reliability of the scales in terms of internal consistency ranged from .74 to .79.

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1. Introduction

Making decisions about school or career is a very important task for young people since these choices can have long-term consequences, such as the commitment of a student to a particular career path involving very long periods of education and training (e.g., Creed, Patton, Prideaux, 2006). According to developmentally focused theories of

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guidance (e.g., Gottfredson, 1981; Super, 1957), the process of educational decision making begins in primary school and continues throughout the life span and implies many factors and abilities (Hartung, Porfeli, & Vondracek, 2005).

One of the most used approaches to analyze the complex process of educational decision making process is the model proposed by Crites (1974). This theory distinguished between two aspects of this process: the content, which is referred to, for example, the type of school chosen, and the process, that is the way through which young adolescents get to an educational choice. Crites (1974) identified also a number of choice competencies relating to the process of decision making, such as goal selection, gathering information, problem solving and self-appraisal. Taylor and Betz (1983), consistently with the social cognitive approach, maintained that an effective decision making process involves not only the development of abilities but also the confidence in one's own perceived ability to successfully complete the tasks necessary for educational decisions. Some studies showed for example that the sense of confidence in the decision making process influenced the exploration of educational options: people with high self-confidence had higher probability of being actively involved in seeking information about available choices (Hackett, 1995). Moreover, the decision making process was associated with anxiety when the self confidence was low (Matsui & Onglatco, 1992). The evaluation of these perceptions has been considered useful to understand the decision making process and the difficulties that could interfere with the success of this process (Taylor & Betz, 1983).

In the Italian context, the end of the lower secondary school (ISCED level 2) constitutes the first important step in the educational decision making process. Here students have to decide between different types of upper secondary schools (e.g., lyceum, technical and professional education). Moreover, the organization of the upper secondary schools has been recently changed, and new types of school are now available. Therefore, instruments that could help lower secondary students in the educational decision making process are especially needed in the Italian context. However, there is a lack of instruments measuring the perceived competence on educational decision making process of the students' in lower secondary school (Nota & Soresi, 2000). As a matter of fact, several instruments have been developed for measuring the self-efficacy in career decision making but they are mostly directed to students attending upper secondary schools and university (e.g., Career Decision Making Self-Efficacy Scale-Short Form, Betz, Klein, Taylor, 1996). In the present study a questionnaire for measuring the perceived competencies in educational decision making process of lower secondary students is proposed and its psychometric properties are analyzed. The questionnaire was developed on the base of the theoretical approaches proposed by Crites (1974) and Taylor and Betz (1983).

1.1. Purpose of the study

The main purpose of this study is to develop the Perceived Competence in Educational Decision-making Process Questionnaire (PCEDPQ) and to examine its factor structure and measurement invariance across gender in the Italian Context.

2. Methods

2.1. Participants and procedures

Subjects were 348 Italian students (49% females and 51% males) who attended the last year of four lower secondary schools which were involved in a project about educational guidance. The PCEDPQ was administered collectively in classroom at the beginning of the project, in the first term of the school year.

2.2. Instrumentation

The development of the PCEDPQ was based on the theoretical approaches proposed by Crites (1974) and Taylor and Betz (1983) and was conducted through a four steps process. In the first step, the items were generated by a committee of professors and researchers experienced in guidance. They were asked to generate items in line with the conceptual definition of the choices competencies relating to the process of decision making process proposed by

Crites (1974) in the specific domain of upper secondary school's choice. A total of 24 items (6 items for each competence) were initially developed. In the second step, this first version of the scale was pre-tested on a sample of 140 lower secondary students (this sample was different from the one used in the present study). In the third step, item analysis and explorative factor analysis were carried out on the pre-test data. In the fourth step, the final version of the scale was defined, on the base of the results of the analyses of pre-test data.

The final version of the scale was composed of 4 subscales each of which included 4 items. The 4 subscales were: goal selection, gathering information, problem solving and self-appraisal. Each item described an activity related to one of the decision making competencies. Students were asked rate the level of perceived competence on a 10 point scale, where 0 corresponded to "no confidence at all" and 10 corresponded to "complete confidence". Table 1 shows some examples of items.

Table 1. Examples of items.

Subscale	Examples of items How confident are you that you could...
Goal Selection	<ul style="list-style-type: none"> Choose a type of upper secondary school that fits your preferred types of learning: (empirical, theoretical etc) Choose a type of upper secondary school that fits your interests.
Gathering information about Upper Secondary School	<ul style="list-style-type: none"> Find information about the school's type you are interested in Find information about the school you are interested in on the school's website
Problem Solving	<ul style="list-style-type: none"> Identify another school you are interested in, if you don't like the type of school you are attending Find a solution if you study and you don't get good results
Self – Appraisal	<ul style="list-style-type: none"> Determine the most important elements in the choice of upper secondary school Evaluate the school subjects in which you are more capable

2.3. Data analysis

A multi-group confirmatory factor analysis (MCFA) was performed using AMOS 18. In accordance with the theoretical structure of the scale, the tested model consisted of four first order factors (goal selection, gathering information, problem solving, self-appraisal) and one second order factor (perceived competence on educational decision-making process). In the model, each item had a nonzero loading on the first order factors, error terms were uncorrelated and covariance between the four first-order factors was fully explained by the second order factor. Measurement invariance was tested across gender in terms of metric invariance, constraining factor loadings to be equal across groups.

3. Results

The tested measurement model had the goodness-of-fit indexes as follows: $\chi^2 = 256.38$ (df=36), $p < .01$, $\chi^2/df = 7.2$, GFI= .91. Coefficients from the completely standardized solution are displayed in Figure 1.

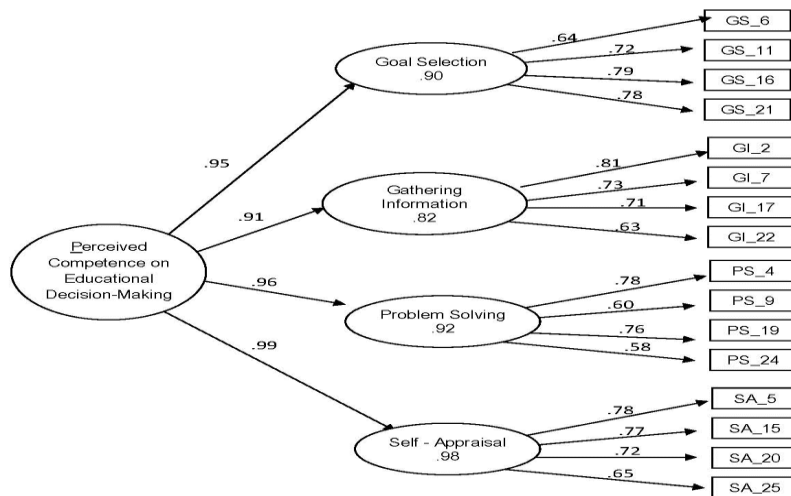


Fig. 1. Results from the Tested Model

The reliability of the subscales in terms of internal consistency was: .79 (*Goal selection*), .77 (*Gathering information*), .74 (*Problem solving*), .77 (*Self-Appraisal*).

As regards the measurement invariance across gender, the chi-square difference between the baseline model and the metric invariance model was not statistically significant ($\Delta \chi^2 = 6.05; df = 12, p = .91$). Results of this analysis are showed in Table 2. According to these results, the PCEDPQ sub-scales can be considered invariant across gender.

Table 2. Equivalence of the PCEDPQ scales across gender

Subgroup Comparison	Configural invariance models	Metric invariance
	(Baseline models)	models
Males vs. Females		
χ^2 (df)	371.9 (72)	377.95 (60)
GFI	.91	.908

4. Discussion

The main goals for this study were to develop the Perceived Competence in Educational Decision-making Process Questionnaire (PCEDPQ) and to examine its factor structure and measurement invariance across gender in the Italian Context. The results showed that the posited model consisting in four first order factors (goal selection, gathering information, problem solving, self-appraisal) and one second order factor (perceived competence on educational decision-making process) fits the data reasonably well.

Furthermore, the PCEDPQ subscales showed a certain degree of internal consistency with the Problem solving subscale as the least reliable of the subscales (Cronbach’s alpha = .74). The analysis showed also the measurement invariance of the scale across gender. This result provides some evidence for the applicability of the scale in studies where differences in perceived competence in educational decision making between males and females are taken into consideration.

The PCEDPQ provides a means by which measuring the lower secondary students’ perceived competence in educational decision making process. The perceptions about one’s own competencies about the ability to complete

the tasks necessary for educational decisions proved to be related to the success of the decision making process (e.g., Hackett, 1995; Matsui & Onglatco, 1992). An evaluation of these perceptions is useful to understand the decision making process and to highlight the difficulties that could interfere with the success of this process (Taylor & Betz, 1983). This information can thus constitute an important instrument to develop guidance activities that are focused on individual student.

The PCEDPQ could be especially useful in the Italian context, where students' are asked to make important choices about their future educational paths at the end of the lower secondary school. This is particularly relevant considering the various recent changes that have been made in the organization of the upper secondary schools in Italy.

Future studies should replicate the findings of this first study on PCEDP on different samples and should include an external criterion for the validation of the scale.

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