

## Assessment of the Efficacy of a Peer Mentoring Program in a University Setting

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In the present study, the efficacy of a formal mentoring program applied to fourth and fifth year students of the Psychology Faculty of the Complutense University is assessed. In this program, fifth-year students took on the role of mentors and fourth-year students, the role of mentees. To assess the efficacy, the group of mentors was compared with a group of non-mentors and the group of mentees with a group of non-mentees, before and after the program, taking into account the variables related to career development function (knowledge acquired of the academic setting and satisfaction with the career of Psychology) and the psychosocial function (self-concept, self-esteem, self-efficacy, and involvement).

The results show a statistically significant increase in the knowledge acquired about the academic setting as a consequence of the program, both in the group of mentors and in the group of mentees. Moreover, the mentors achieved a better average grade in the subjects of the specialty of Work Psychology. There were no statistically significant differences between the experimental group and the control group in satisfaction with the career of Psychology, or in self-concept, self-esteem, or self-efficacy.

*Keywords:* mentoring, career development, orientation, program assessment.

En el presente estudio se evalúa la eficacia de un programa de mentoring formal implantado en la Facultad de Psicología de la Universidad Complutense en alumnos de segundo ciclo. En dicho programa los alumnos de quinto curso asumían el rol de mentores y los de cuarto curso el rol de telémacos. Para evaluar la eficacia se contrasta el grupo de mentores con el grupo de no mentores y el grupo de telémacos con el grupo de no telémacos, antes y después del programa, atendiendo a variables relacionadas con la función de desarrollo de carrera (conocimientos adquiridos sobre el entorno académico, y satisfacción con la carrera de Psicología) y con la función psicosocial (autoconcepto, autoestima, autoeficacia e implicación).

Los resultados encontrados muestran un incremento estadísticamente significativo en los conocimientos adquiridos respecto al entorno académico como consecuencia del programa, tanto para el grupo de mentores como para el grupo de telémacos. Además, los mentores consiguen un mejor promedio en las calificaciones de las asignaturas de la especialidad de Psicología del Trabajo. No aparecen diferencias estadísticamente significativas entre el grupo experimental y el grupo control ni en la satisfacción con la carrera de Psicología, ni en el autoconcepto, la autoestima y la autoeficacia.

*Palabras clave:* mentoring, desarrollo de carrera, orientación, evaluación de programas.

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Currently, the characteristics of the work setting reveal flat organigrams in which there is no defined assignment of ascending or descending hierarchical chains. In this kind of organizational structures, mentoring programs are frequently applied to facilitate active learning at lower costs in terms of time and effort.

A defining note of the mentoring actions, about which there seems to be high agreement (Dalton, Thompson, & Price, 1977; Hall, 1976; Kram, 1983; Levinson, Darrow, Klein, Levinson, & McKeen, 1978), refers to an intense interpersonal exchange between a mentor (who provides support, direction, and feedback about career plans and personal development) and a mentee (who receives the mentoring action).

In Anglo-Saxon universities, the development of programs or mentoring systems is usually carried out by students of higher courses ("peer mentoring"), who, by means of a tutoring process, orient the first-year students and students of exchange programs academically and professionally. These mentoring programs place emphasis on the connection between academic and social aspects.

In the Spanish university sphere, mentoring programs focus on a link between the students and the diverse resources that the Institution provides for the University Community: orientation and job-hunting services, facilities, academic, cultural, and sport activities, etc.

In Spanish universities, various projects are noteworthy: the SIMUS Project, promoted by the University of Seville, in which the universities of Cádiz, Granada, Murcia, and Seville and the Complutense University of Madrid also participate. The Polytechnic University of Madrid has applied a program of similar characteristics and the Polytechnic Universities of Barcelona and Valencia have also developed mentoring systems (Valverde, García, & Romero, 2003). These programs target newly admitted students: first-year students and students from university exchange programs (Erasmus, Seneca, etc.).

However, the program analyzed in this study is a pioneer program in the Spanish setting, because it implies the implementation of mentoring actions aimed at second-cycle students registered in a definite academic specialty. There have been such actions in other countries, but, as noted by Wang (2001), the characteristics and context of each country causes mentors and mentees to differ in their beliefs, in the way they interact, and in their needs, which makes generalization from one country to another impossible. Therefore, we consider it very important to initiate these kinds of experiences in different countries and situations.

When applying mentoring programs, attention to details and planning of some of their characteristics, such as the definition of the phases, the modalities, the functions of the agents involved (mentor and mentee), definition of the variables to be assessed, analysis of the data collected, and communication of the results obtained are all very relevant.

Kram (1983, 1985) suggests that there are four phases in a mentoring process: initiation, cultivation or development, separation, and redefinition. In the first phase, the definition of the purpose of mentoring, the verbalization of the perceptions and expectations of mentors and mentees, their mutual knowledge of each other, the establishment of goals and the planning of the sessions are especially relevant. In the cultivation or development phase, the mentee should develop proactive behavior, whereas the mentor guides the session, reviews the goals and action plans, analyzes the successes and difficulties that have arisen, and establishes new goals and actions. The third phase, separation, implies the beginning of the mentee's independence from the mentor. In the last phase, the mentoring relation is over and a more informal and supportive relationship between mentors and mentees may evolve.

Various modalities of mentoring are distinguished. Formal mentoring, in which there is generally a process of assignment or pairing of mentors and mentees initiated by third parties, is distinguished from informal mentoring, in which the relations emerge spontaneously through a process of mutual attraction. Formal mentoring is usually shorter than informal mentoring although the differences in the results obtained in each of these types of mentoring are neither clear nor univocal (Allen & Eby, 2004; Chao, Walz, & Gardner, 1992; Fagenson-Eland, Marks, & Amendola, 1997; Ragins & Cotton, 1999; Scandura & Williams, 2001).

Other modalities that are contemplated are group mentoring, in which a mentor has various mentees, and dyad mentoring, in which there is one mentor with a single mentee. Mentoring between different ranks or levels, in which the mentor has a higher rank than the mentee, who is a subordinate, is different from peer mentoring, in which both have the same hierarchical level. Although most of the investigations propose dyad mentoring (Scandura & Schriesheim, 1991), in some contexts, depending on the goals proposed when applying these programs, group mentoring may be more appropriate because of the importance of group synergy in this kind of process (Dansky, 1996; Green & King, 2001; Hooker, Nakamura, & Csikszentmihaly, 2003; Kalet, Krackov, & Rey, 2002) and because of the possibility of the mentees' benefiting from the mentor's teachings and advice, as well as from the exchange of ideas and feedback they receive from the rest of the group members (Kaye & Jacobson, 1995).

Normally, there are two functions in a mentoring relation, career development function and the psychosocial function (Kram, 1985; Noe, 1988; Scandura, 1992).

Career development function is an instrumental function with diverse aspects that allow mentees to improve professionally and/or academically, facilitating the advance in their careers through the training and the challenges posed by the mentor. In the university context, this function may be operationalized by the increase in their knowledge acquired about the academic setting, academic performance, and satisfaction with the studies they are pursuing.

The psychosocial function involves personal aspects of relationship and communication, as a result of which, there is an increase and improvement in self-concept, self-esteem, self-efficacy, and other variables such as involvement. Valle et al. (1999) define self-concept as a person's set of perceptions and beliefs about the self in different areas. To a great extent, academic self-concept determines academic performance and has an impact on intrinsic motivation towards learning. Self-esteem is the evaluative facet of self-concept, referring to how people appraise their own self-concept linked to the ideal self-concept and other people's ideal of the individual. Bandura (1977) defines self-efficacy as the beliefs in one's own capacity to organize and perform the actions required to deal with future situations. The concept of involvement refers to feelings of interest and enthusiasm towards a certain goal. According to Greenwald and Leavitt (1984), high involvement with an object refers to the importance or personal relevance of the object; therefore, the concept of involvement is sometimes identified with the perceived importance and relevance of something in a person's life.

Some investigations in school and university settings found that mentoring relations achieve better academic grades, higher satisfaction with studies, higher self-esteem, and more involvement (Allen, McManus, & Russell, 1999; Kelly & Schweitzer, 1997; Linnehan, 2001; Tenenbaum, Crosby, & Gliner, 2001).

The present study was carried out with students from the fourth and fifth year of the Psychology degree, registered in the specialty of Work Psychology. The global purpose of the program consisted of facilitating success in the transactions and choices of students at this academic stage, because, as indicated by Garvey and Alrd (2003), mentoring programs are often developed when the subjects carry out transitions at key points in their professional or occupational careers. From our viewpoint, the passage to the second cycle of a university degree and the performance of a professional *practicum* are transitions that are of vital importance within the context of the Spanish university.

The methodology employed is based on formal group mentoring, in which a mentor, a fifth-course student, mentors one or two fourth-course students. Note that this is peer mentoring, because both groups have the same academic status (students) although the mentors' experience and knowledge is higher than that of the mentees. Moreover, it is based on a hierarchical chain made up of the teachers-tutors, who coordinate the program, and the mentors and mentees. The program had a duration of 6 months. Each mentor met the mentee or group of mentees and also maintained contact with them by means of e-mail, that is, by e-mentoring (Hamilton & Scandura, 2003). The mentors handed over to the assigned teacher-tutor a card on which all the observations and incidences of each mentoring session were written down. Once a month, the four teacher-tutors met with the group of mentors to carry out a follow-up of the program.

The main goal of this study is to assess the efficacy and efficiency of the program taking into account variables related to the career development function and the psychosocial function. To assess the efficacy, we analyzed the similarities and differences among the mentors and non-mentors and mentees and non-mentees before and after application of the program.

This goal was operationalized by means of the following hypotheses:

Hypothesis 1a: after completing the mentoring program, the mentor students will present a higher level of knowledge about the academic setting than the non-mentors.

Hypothesis 1b: upon completing the mentoring program, the mentee students will present a higher level knowledge about the academic setting than the non-mentees.

Hypothesis 2a: upon completing the mentoring program, the mentor students will obtain higher average academic grades in the specialty of Work Psychology than the non-mentors.

Hypothesis 2b: after completing the mentoring program, the mentee students will obtain higher academic grades in the specialty of Work Psychology than the non-mentees.

Hypothesis 3a: upon completing the mentoring program, the mentor students will be more satisfied with the career of Psychology than the non-mentors.

Hypothesis 3b: upon completing the mentoring program, the mentee students will be more satisfied with the career of Psychology than the non-mentees.

Hypothesis 4a: after completing the mentoring program, the mentor students will have a better self-concept, higher self-esteem, and more self-efficacy than the non-mentors.

Hypothesis 4b: after completing the mentoring program, the mentee students will have a better self-concept, higher self-esteem, and more self-efficacy than the non-mentees.

Hypothesis 5a: after completing the mentoring program, the mentor students will be more involved in Work Psychology than the non-mentors.

Hypothesis 5b: after completing the mentoring program, the mentee students will be more involved in Work Psychology than the non-mentees.

## Method

### Design

We used a quasi-experimental design with repeated pre- and posttest measures with regard to the application of the mentoring program described, with a control group and an experimental group.

The experimental group was made up of students who participated as mentors in the application of a mentoring program in the Psychology Faculty of the Complutense University of Madrid, and the control group was made up of students who did not participate but who, like the mentors, were registered in the 5th course of the specialty of Work Psychology of this university. This control group was called the non-mentor group.

The experimental group was also made up of the students who participated as mentees in the mentoring program and the control group was also made up of students who did not participate but whom, like the mentees, were registered in the 4th course. This control group was called the non-mentee group.

The mentors received a training course, they directed and prepared the contents addressed in their meetings with the mentees, and they also were in charge of the adequate mentoring process. The mentees received the information provided by their mentors, they presented their doubts, misgivings, and demands. Therefore, the treatment received by each one of the two groups that participated in the program, mentors and mentees, was different, which led to differential analysis of the groups.

At both times (pretest and posttest), we assessed the variables related to career development function and the psychosocial function. Within the career development function, we also assessed the participants' academic performance, but this variable was only available as a posttest measurement, after the specialty subjects had been completed.

### Participants

In this study, participants were 199 students, who were registered in the specialty of Work Psychology of the Psychology Faculty of the Complutense University of Madrid. The group of mentors comprised 33 students (27 women and 6 men) and the group of non-mentors comprised 70 students (57 women and 13 men), all registered in the 5th course. The group of mentees comprised 47 students (40 women and 7 men), the group of non-mentees was made up of 41 students (32 women and 9 men), all of them in the 4th course. Mean age was 22.53 years ( $SD = 2.14$ ).

### Instruments

In order to goal assess the variables related to career development function, an ad hoc questionnaire was developed in which we collected information about the following aspects:

Students' knowledge about the academic setting. We elaborated 26 open questions to collect information about students' knowledge of the available resources on the faculty (library, on-line resources, computer resources, medical and complementary services, etc.), the academic-

administrative organization of the university, pre- and postgraduate training offers on the market, the diverse professionals options (profiles and settings) for which their university studies prepared them, and the diverse professional actions to undertake in order to join the labor market once their university training had concluded (Psychologists' Association, employment agencies, job-hunting techniques, etc.). We tabulated and coded the data obtained from the qualitative information collected. For each correct response, one point was assigned. Two variables were made up of the sum of the frequencies of the students' correct responses before and after the program.

Academic performance was quantified as the participants' average grades in the subjects of the specialty of Work Psychology.

The degree of general satisfaction with the career of Psychology ("*Till now, in general, my career satisfaction is...*"). The response format was a 5-point Likert-type scale, ranging from 1 (*completely dissatisfied*) to 5 (*completely satisfied*).

To assess the variables related to the psychosocial function (self-concept, self-esteem, self-efficacy, and involvement), we used the following instruments:

Self-concept was measured by means of an adaptation of the Self-concept Scale Form 5-AF5 (Musitu & García, 2001); an example item of the questionnaire is: "*I do my course-work well*". Reliability of the five items, calculated with Cronbach's alpha was .71.

Self-esteem was assessed with Rosenberg's (1965) Self-Esteem scale, translated to Spanish by Echeburúa (1995), which has 10 items with a 5-point Likert-type response format. An item of this scale is "*I feel that I'm a person of worth, or at least on equal plane with others*". Cronbach's alpha for the sample of this study reached the value of .70.

Self-efficacy was measured by means of the Self-Efficacy Scale of Baessler and Schwarzer (1996). Specifically, we used a Spanish adaptation of the scale carried out by means of the back-translation method, made up of 10 items with a 5-point Likert-type response format. An example item of the scale is "*I can solve difficult problems if I make an effort*". The Cronbach's alpha obtained was .82.

Involvement in Work Psychology was assessed with a 7-point Likert-type scale with 19 adjectives in the form of a semantic differential (an example item is "*important---not important*"). This scale is an adaptation (Alonso, Castaño, Sánchez-Herrero, & Calles, 2004) of Zaichowsky's (1985) scale that has been analyzed in many studies by diverse

authors to assess consumer behavior, for example, by Goldsmith and Emmert (1991), Jain and Srinivasan (1990), McQuarrie and Munson (1987, 1992), and even by Zaichkowsky (1987), who presented a reduced 10-item scale. Cronbach's alpha was higher than .90. The factor analysis performed with the items of the instrument (principal axes with varimax rotation with Kaiser) distinguished three facets of involvement with Work Psychology: *Emotional* (which explained 55.79% of the information and was made up of 11 items that reached an alpha of .92; some adjectives included in this factor were: pleasant, satisfactory, entertaining, fun, pleasing, attractive, etc.); *Centrality* (explained 12.23%; the 5 items that comprised it had an alpha of .85; the adjectives that loaded on this factor were: important, I feel involved, relevant, useful, and significant); and *Need* (explained 5.12%; the alpha obtained was .65; it was made up of three adjectives: vital, essential, and necessary).

### Procedure

Participant selection was done by means of a two-wave sampling. At the beginning, it was decided that only the students of the morning shift could participate in the program, so the afternoon group made up the control group. Then, the mentoring program was presented to the students of the morning shift and, as recommended by Tokar, Fischer, and Subich (1998) and Allen (2003), they voluntarily decided whether or not to participate.

Before applying the mentoring program, the diverse (pretest) assessment instruments were collectively administered to all the students registered in the specialty of Work Psychology in their classrooms. Next, the first meeting took place, attended by the teacher-tutors and the participating students. In this session, the goals of the mentoring program were presented and the roles of mentors and mentees were assigned. The mentors received a training course, after which, they performed their role by means of a series of biweekly meetings. The program was carried out between the months of November and

Table 1

*Descriptive statistics of mentors and non-mentors in the variables related to the career development function of mentoring*

| Variables                      | Mentors<br>(n = 33) |       | Non-mentors<br>(n = 70) |       |
|--------------------------------|---------------------|-------|-------------------------|-------|
|                                | M                   | SD    | M                       | SD    |
| Knowledge (pretest)            | 41.81               | 10.07 | 43.84                   | 9.90  |
| Knowledge (posttest)           | 57.52               | 14.92 | 50.29                   | 10.39 |
| Career satisfaction (pretest)  | 3.71                | .90   | 3.73                    | .75   |
| Career satisfaction (posttest) | 3.77                | .81   | 3.67                    | .74   |

Table 2

*Descriptive statistics of mentors and non-mentors in variables related to the psychosocial function of mentoring*

| Variables                         | Mentors<br>(n = 33) |       | Non-mentors<br>(n = 70) |      |
|-----------------------------------|---------------------|-------|-------------------------|------|
|                                   | M                   | SD    | M                       | SD   |
| Self-concept (pretest)            | 20.26               | 2.45  | 19.02                   | 2.62 |
| Self-concept (posttest)           | 20.03               | 3.21  | 19.59                   | 2.21 |
| Self-esteem (pretest)             | 40.55               | 4.09  | 40.02                   | 5.00 |
| Self-esteem (posttest)            | 40.77               | 5.60  | 40.62                   | 4.55 |
| Self-efficacy (pretest)           | 39.32               | 3.85  | 37.09                   | 5.26 |
| Self-efficacy (posttest)          | 39.84               | 4.13  | 39.03                   | 4.32 |
| Emotional involvement (pretest)   | 64.06               | 7.58  | 59.83                   | 8.56 |
| Emotional involvement (posttest)  | 61.55               | 10.52 | 58.10                   | 7.16 |
| Involvement-needs (pretest)       | 16.77               | 2.20  | 15.64                   | 2.29 |
| Involvement-needs (posttest)      | 17.23               | 2.57  | 15.61                   | 2.45 |
| Involvement-centrality (pretest)  | 32.29               | 2.53  | 31.70                   | 2.90 |
| Involvement-centrality (posttest) | 32.16               | 3.15  | 31.12                   | 2.89 |

April. During the first half of May, the diverse (posttest) assessment instruments were once again administered. Both pre- and posttest assessments were made collectively in the classroom, both with the students from the control group and the experimental group.

### Results

The descriptive statistics obtained by the groups of mentors and non-mentors in the variables related to the career development function and the psychosocial function of mentoring, respectively, are presented in Table 1 and 2.

The descriptive statistics obtained by the group of mentees and non-mentees in the variables related to the career development function and the psychosocial function of mentoring, respectively, are presented in Tables 3 and 4.

To contrast the diverse hypotheses formulated, we performed several two-factor ANOVAs with repeated

measures in one factor (pre- and posttest). The factor corresponded to participation in the program (mentors and non-mentors, on the one hand, and mentees and non-mentees, on the other), and the dependent variables were those described both in the career development function and the psychosocial function of mentoring.

The first step was to verify the assumptions of normality of the dependent variables and the homogeneity of the variance-covariance matrixes of the diverse groups being contrasted. Except for one, all cases satisfied these conditions, thus, the results obtained in the statistical analyses are presented, in the same order in which the hypotheses were formulated.

First, we present the variables related to career development function. The first was the level of knowledge about the academic setting for mentors and non-mentors. This was the only case in which the assumption of the

Table 3  
*Mentees and non-mentees and career development variables*

| Variables                    | Mentees<br>( <i>n</i> = 47) |           | Non-mentees<br>( <i>n</i> = 41) |           |
|------------------------------|-----------------------------|-----------|---------------------------------|-----------|
|                              | <i>M</i>                    | <i>SD</i> | <i>M</i>                        | <i>SD</i> |
| Pretest knowledge            | 38.18                       | 9.52      | 35.41                           | 12.41     |
| Posttest knowledge           | 50.12                       | 19.10     | 33.53                           | 7.92      |
| Pretest career satisfaction  | 3.59                        | .73       | 3.48                            | .63       |
| Posttest career satisfaction | 3.62                        | .78       | 3.62                            | .56       |

Table 4  
*Mentees and non-mentees and psychosocial variables*

| Variables                        | Mentees<br>( <i>n</i> = 47) |           | Non-mentees<br>( <i>n</i> = 41) |           |
|----------------------------------|-----------------------------|-----------|---------------------------------|-----------|
|                                  | <i>M</i>                    | <i>SD</i> | <i>M</i>                        | <i>SD</i> |
| Pretest self-concept             | 18.97                       | 2.83      | 19.03                           | 2.66      |
| Posttest self-concept            | 19.00                       | 2.41      | 18.83                           | 1.78      |
| Pretest self-esteem              | 39.19                       | 4.23      | 38.33                           | 5.97      |
| Posttest self-esteem             | 39.59                       | 5.70      | 39.07                           | 4.96      |
| Pretest self-efficacy            | 37.34                       | 5.01      | 36.67                           | 4.56      |
| Posttest self-efficacy           | 36.59                       | 6.17      | 37.73                           | 5.77      |
| Pretest emotional involvement    | 59.33                       | 8.16      | 54.77                           | 8.17      |
| Posttest emotional involvement   | 55.92                       | 10.06     | 54.00                           | 9.60      |
| Involvement: pretest needs       | 15.79                       | 1.96      | 15.43                           | 2.34      |
| Involvement: posttest needs      | 16.00                       | 2.15      | 15.33                           | 2.20      |
| Involvement: pretest centrality  | 30.83                       | 2.73      | 31.83                           | 2.97      |
| Involvement: posttest centrality | 31.33                       | 2.67      | 31.00                           | 3.92      |

homogeneity of the variance-covariance matrixes was not met in both these groups ( $M = 8.68$ ,  $F = 2.81$ ,  $p = .038$ ). Nevertheless, as in our case the variance of the largest group (non-mentors) was smaller than that of the smallest group (mentors), the power of the contrast was reduced and, therefore, the level of significance was increased to .1 for this variable, as recommended by Hair, Anderson, Tatham, and Black (1999).

The results revealed statistically significant differences in the repeated measures factor, students' knowledge before and after the application of the mentoring program,  $F(1, 80) = 117.53$ ,  $p < .001$ ,  $\eta_p^2 = .60$ ,  $p = 1.00$ , and in the interaction of the factor knowledge (repeated measures) and the factor participation,  $F(1, 80) = 20.52$ ,  $p < .001$ ,  $\eta_p^2 = .20$ ,  $p = .99$ . As there were statistically significant differences in the interaction of both factors, participation and knowledge, we performed multiple comparisons using Bonferroni's adjustment. The results obtained showed that both in the group of mentors,  $F(1, 80) = 94.96$ ;  $p < .001$ ,  $\eta_p^2 = .54$ ,  $p = 1.00$ , and in the group of non-mentors,  $F(1, 80) = 26.34$ ,  $p < .001$ ,  $\eta_p^2 = .25$ ,  $p = .999$ , there was a statistically significant increase in the level of knowledge when comparing these temporal moments (see Figure 1).

But upon analyzing the differences between mentors and non-mentors before and after application of the mentoring program, the results showed that there were no statistically significant differences in the level of knowledge expressed by both groups before applying the program,  $F(1, 82) = .441$ ,  $p = .51$ ,  $\eta_p^2 = .005$ ,  $p = .101$ . However, there were statistically significant differences, favoring the mentors, after the application of the program,  $F(1, 82) = 6.66$ ,  $p = .012$ ,  $\eta_p^2 = .077$ ,  $p = .72$ . These results indicated that, although both groups acquired knowledge over time, the group of mentors acquired more knowledge.

Therefore, the results allowed us to accept Hypothesis 1a and to conclude that the level of knowledge of the academic setting was higher in the mentors than in the non-mentors after completing the mentoring program, as their levels were similar before the program.

When assessing knowledge of the academic setting of the mentees and non-mentees, the results revealed statistically significant differences in the level of knowledge of the academic setting before and after application of the program,  $F(1, 63) = 18.07$ ,  $p < .001$ ,  $\eta_p^2 = .22$ ,  $p = .99$ , and in the factor participation,  $F(1, 63) = 7.70$ ,  $p < .001$ ,  $\eta_p^2 = .11$ ,  $p = .78$ , and in the interaction of both factors,  $F(1,$

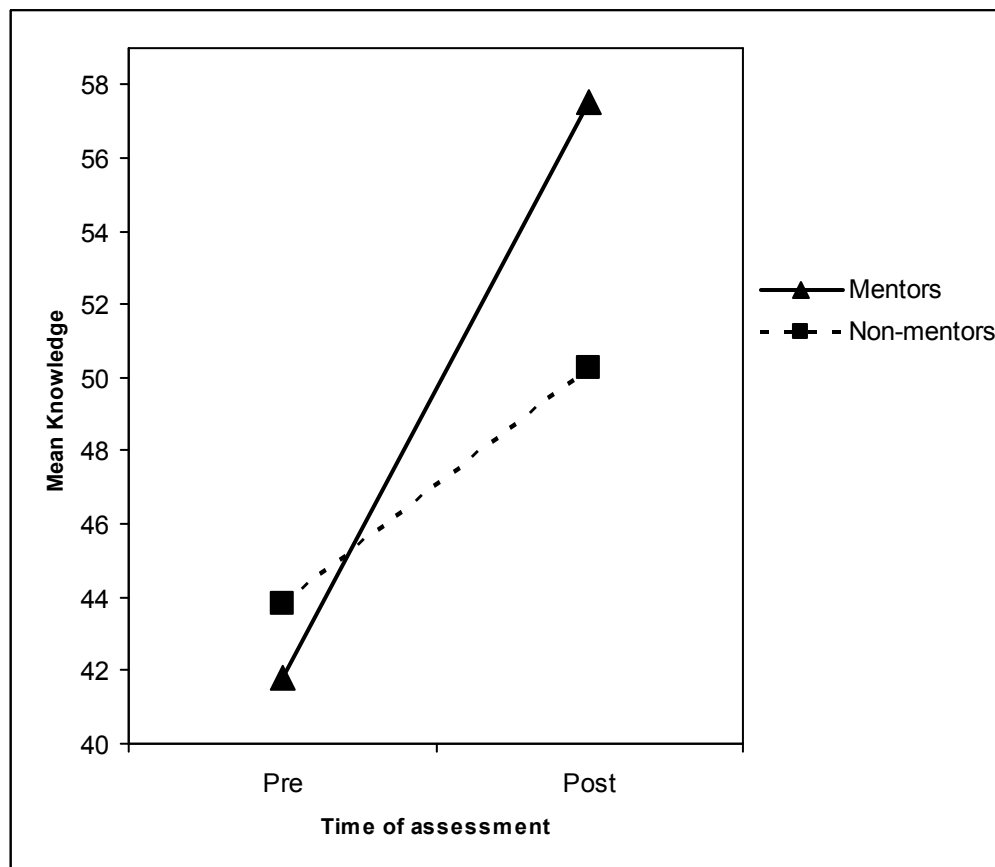


Figure 1. Mean level of knowledge of mentors and non-mentors before and after application of the mentoring program.

63) = 28.99,  $p < .001$ ,  $\eta_p^2 = .32$ ,  $p = 1.00$ . As there were statistically significant differences in the interaction of both factors, participation and knowledge, we performed multiple comparisons using Bonferroni's adjustment. The results obtained showed that, for the group of mentees, there was a statistically significant increase in their level of knowledge after completing the mentoring program,  $F(1, 63) = 47.17$ ,  $p < .001$ ,  $\eta_p^2 = .43$ ,  $p = 1.00$ . In contrast, for the group of non-mentees, the students who were not mentored, there were no statistically significant differences,  $F(1, 63) = .63$ ,  $p = .43$ ,  $\eta_p^2 = .01$ ,  $p = .123$ , during the same interval (see Figure 2).

Upon analyzing the differences between mentees and non-mentees before and after application of the mentoring program, the results revealed no statistically significant differences in the level of knowledge of both groups before administering the program,  $F(1, 66) = .069$ ,  $p = .79$ ,  $\eta_p^2 = .001$ ,  $p = .058$ . However, statistically significant differences, favoring the mentees, were found in the level of knowledge of both groups after concluding the mentoring program,  $F(1, 63) = 20.68$ ,  $p < .001$ ,  $\eta_p^2 = .25$ ,  $p = .99$ . That is, the mentored students gained an important level of knowledge about the academic setting in comparison to the students who were not mentored.

Therefore, Hypothesis 1b was accepted, as upon completing the mentoring program, the mentee students presented a higher level of knowledge of the academic setting than the non-mentees, having started with similar levels before beginning the program.

Summing up, the data show the success of the program with regard to the knowledge acquired by the participants. That is, the participant students (mentors and mentees) had a higher level of knowledge than the non-participants (non-mentors and non-mentees) upon completing the mentoring program.

As we only had one measure of academic performance after the application of the mentoring program, in order to contrast the values obtained by the groups in this variable, we carried out a one-factor ANOVA between mentors and non-mentors, on the one hand, and mentees and non-mentees, on the other. The results obtained revealed statistically significant differences,  $F(1, 88) = 10.66$ ,  $p = .002$ ,  $\eta_p^2 = .108$ ,  $p = .90$ , between the student mentors ( $M = 6.58$ ,  $SD = 1.22$ ) and non-mentors ( $M = 5.72$ ,  $SD = 1.17$ ). However, the results did not reveal statistically significant differences,  $F(1, 61) = .05$ ,  $p = .82$ ,  $\eta_p^2 = .001$ ,  $p = .06$ , between mentees ( $M = 6.08$ ,  $SD = 2.10$ ) and non-mentees ( $M = 5.97$ ,  $SD = 1.73$ ).

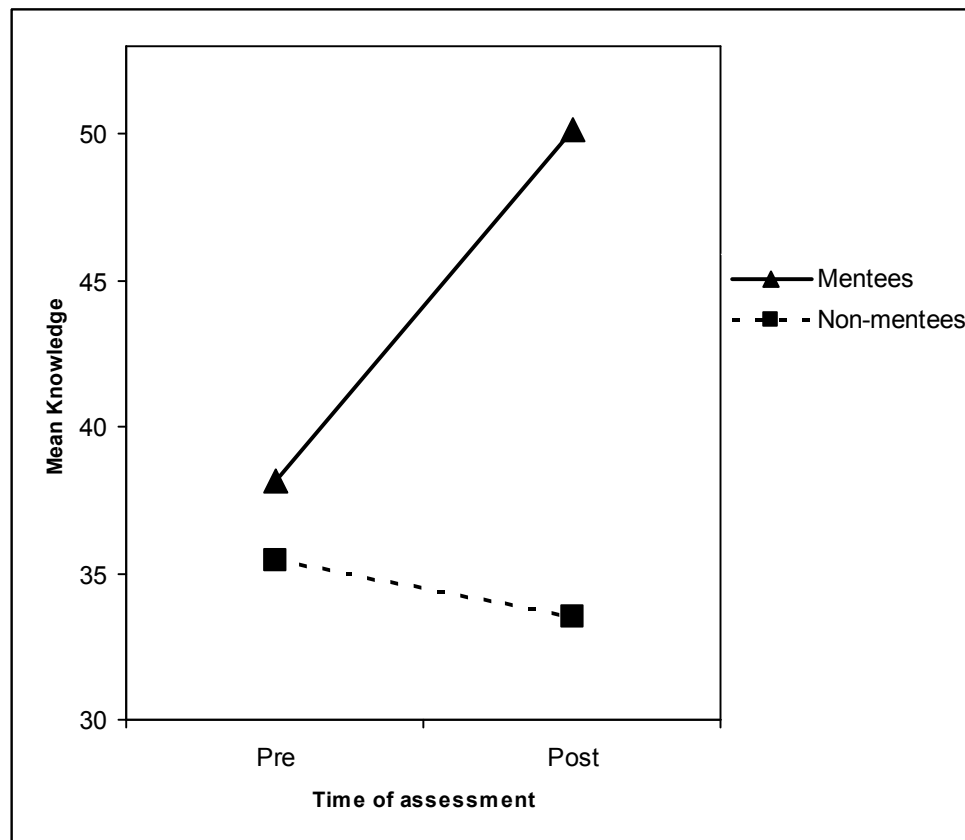


Figure 2. Mean level of knowledge of mentees and non-mentees before and after application of the mentoring program.



Therefore, Hypothesis 2a was confirmed and Hypothesis 2b was rejected. That is, although the student mentors obtained higher academic performance than the non-mentors, the same could not be said for the mentees in comparison to the group of non-mentees. As commented below, these statements should be taken cautiously, as we have no pretest measure.

Thirdly, we analyzed satisfaction with the career of Psychology. The values obtained in this variable by student mentors and non-mentors were very similar, both before and after the mentoring program (see Table 1). The differences in the measures taken before and after the mentoring program were not statistically significant,  $F(1, 74) = .00$ ,  $p = .99$ ,  $\eta_p^2 = .00$ ,  $p = .05$ , either between mentors and non-mentors,  $F(1, 74) = .07$ ,  $p = .80$ ,  $\eta_p^2 = .001$ ,  $p = .06$ , or in the interaction of the temporal moment and the group of participants  $F(1, 74) = .60$ ,  $p < .001$ ,  $\eta_p^2 = .01$ ,  $p = .12$ .

Similar results were obtained when comparing the group of mentees with that of the non-mentees. The results did not reveal a statistically significant effect of the factor moment  $F(1, 56) = .79$ ,  $p = .377$ ,  $\eta_p^2 = .014$ ,  $p = .141$ , or of the factor participation,  $F(1, 56) = .118$ ,  $p = .732$ ,  $\eta_p^2 = .002$ ,  $p = .063$ , or in the interaction of both factors,  $F(1, 56) = .29$ ,  $p = .595$ ,  $\eta_p^2 = .005$ ,  $p = .082$ .

The student mentors and mentees did not present a higher level of satisfaction with the career of Psychology in comparison to the non-mentor and non-mentee students, respectively. Therefore Hypotheses 3a and 3b of the study were rejected.

Below are presented the results obtained regarding the psychosocial function of mentoring.

When analyzing the variable self-concept in mentors and non-mentors, no statistically significant differences were observed either between pre- and posttest measures,  $F(1, 73) = .32$ ,  $p = .57$ ,  $\eta_p^2 = .004$ ,  $p = .086$ , in the factor participation,  $F(1, 73) = 2.49$ ,  $p = .12$ ,  $\eta_p^2 = .03$ ,  $p = .34$ , or in their interaction,  $F(1, 73) = 1.71$ ,  $p = .20$ ,  $\eta_p^2 = .02$ ,  $p = .25$ .

When contrasting the group of mentees and non-mentees, the results were similar, as no statistically significant differences were found either for the factor time of assessment,  $F(1, 59) = .074$ ,  $p = .786$ ,  $\eta_p^2 = .001$ ,  $p = .058$ , for the factor participation,  $F(1, 59) = .008$ ;  $p = 0.927$ ,  $\eta_p^2 = .000$ ,  $p = .051$ , or for the interaction of both factors,  $F(1, 59) = .143$ ,  $p = .707$ ,  $\eta_p^2 = .002$ ,  $p = .066$ .

With regard to self-esteem, the differences were not statistically significant for the mentors and non-mentors either in the factor time of assessment,  $F(1, 71) = .69$ ,  $p = .41$ ,  $\eta_p^2 = .01$ ,  $p = .13$ , in the factor participation,  $F(1, 71) = .11$ ,  $p = .74$ ,  $\eta_p^2 = .002$ ,  $p = .06$ , or in their interaction,  $F(1, 71) = .14$ ,  $p = .71$ ,  $\eta_p^2 = .002$ ,  $p = .07$ .

Similar results were obtained when contrasting self-esteem in the group of mentees and non-mentees, finding no statistically significant differences for the factor time of assessment,  $F(1, 60) = .887$ ,  $p = .35$ ,  $\eta_p^2 = .015$ ,  $p = .153$ ,

participation,  $F(1, 60) = .034$ ,  $p = .85$ ,  $\eta_p^2 = .001$ ,  $p = .054$ , or their interaction,  $F(1, 60) = .07$ ,  $p = .788$ ,  $\eta_p^2 = .001$ ,  $p = .058$ .

The results obtained in the variable self-efficacy in mentors and non-mentors yielded no statistically significant differences in the factor time of assessment,  $F(1, 73) = 3.19$ ,  $p = .08$ ,  $\eta_p^2 = .04$ ,  $p = .42$ , or in the between-subject factor,  $F(1, 73) = 3.92$ ,  $p = .052$ ,  $\eta_p^2 = .05$ ,  $p = .50$ , or in the interaction of both factors,  $F(1, 73) = .65$ ;  $p = .42$ ,  $\eta_p^2 = .009$ ,  $p = .13$ .

Similar results were obtained when contrasting the group of mentees and non-mentees: no statistically significant differences were obtained for the factor time of assessment,  $F(1, 60) = .073$ ,  $p = .79$ ,  $\eta_p^2 = .001$ ,  $p = .058$ , or for participation,  $F(1, 60) = .034$ ,  $p = .85$ ,  $\eta_p^2 = .001$ ,  $p = .054$ , or for their interaction,  $F(1, 60) = 2.41$ ,  $p = .125$ ,  $\eta_p^2 = .039$ ,  $p = .33$ .

Ultimately, Hypotheses 4a and 4b were not confirmed, because the student mentors obtained similar scores in self-concept, self-esteem, and self-efficacy upon completing the mentoring program as the non-mentors. The same can be said about the mentees and non-mentees.

As presented in the Instruments section, there are three facets of involvement in Work Psychology: emotional, centrality, and needs.

In the emotional facet of the variable involvement, the results for mentors and non-mentors revealed a statistically significant effect of the factor time of assessment,  $F(1, 70) = 11.74$ ,  $p < .001$ ,  $\eta_p^2 = .14$ ,  $p = .922$ , and the factor participation,  $F(1, 70) = 4.02$ ,  $p = .049$ ,  $\eta_p^2 = .054$ ,  $p = .507$ . However, no statistically significant effect was found for the interaction of these factors  $F(1, 70) = .40$ ;  $p = .529$ ,  $\eta_p^2 = .006$ ,  $p = .096$ . Emotional involvement was lower for both groups at the end of the program (see Table 2).

In the centrality facet, the results for mentors and non-mentors revealed no statistically significant effect for the factor time of assessment,  $F(1, 72) = 1.10$ ,  $p = .297$ ,  $\eta_p^2 = .015$ ,  $p = .179$ , or for the factor participation,  $F(1, 72) = 1.94$ ,  $p = .168$ ,  $\eta_p^2 = .026$ ,  $p = .279$ , or for the interaction of these factors,  $F(1, 72) = .48$ ,  $p = .506$ ,  $\eta_p^2 = .006$ ,  $p = .101$ .

With regard to needs facet, for both mentors and non-mentors, the effect of the factor time of assessment was not statistically significant,  $F(1, 73) = .69$ ,  $p = .408$ ,  $\eta_p^2 = .009$ ,  $p = .130$ , however, it was significant for the factor participation,  $F(1, 73) = 7.71$ ,  $p = .01$ ,  $\eta_p^2 = .096$ ,  $p = .782$ . The effect of the interaction of these factors was not statistically significant,  $F(1, 73) = .85$ ,  $p = .36$ ,  $\eta_p^2 = .011$ ,  $p = .149$ . The results showed that both before and after the application of the program, the mentors considered the discipline of Work Psychology to be more necessary than did the non-mentors (see Table 2). Therefore, Hypothesis 5 was not accepted.

When assessing emotional involvement, the results for mentees and non-mentees revealed a statistically significant effect of the factor time of assessment  $F(1, 52) = 4.47$ ,  $p = .04$ ,  $\eta_p^2 = .08$ ,  $p = .55$ , but no statistically significant effect was found for participation  $F(1, 52) = 2.05$ ,  $p = .16$ ,  $\eta_p^2 = .04$ ,  $p = .29$ , or for the interaction,  $F(1, 52) = 1.79$ ,  $p = .19$ ,  $\eta_p^2 = .03$ ,  $p = .26$ . The results showed that, before the application of the program, the mentees and non-mentees were more emotionally involved in the discipline of Work Psychology than at the end of the program (see Table 4).

Regarding the centrality facet of involvement, no statistically significant differences were observed in the pre- and posttest measures,  $F(1, 52) = .16$ ,  $p = .67$ ,  $\eta_p^2 = .003$ ,  $p = .067$ , either between mentees and non-mentees,  $F(1, 52) = .20$ ,  $p = .66$ ,  $\eta_p^2 = .004$ ,  $p = .72$ , or in the interaction,  $F(1, 52) = 2.47$ ,  $p = .12$ ,  $\eta_p^2 = .05$ ,  $p = .34$ .

The same occurred with the needs facet, where no statistically significant differences were found in the pre- and posttest measures,  $F(1, 52) = .23$ ,  $p = .88$ ,  $\eta_p^2 = .001$ ,  $p = .053$ , between mentees and non-mentees,  $F(1, 52) = 1.14$ ,  $p = .29$ ,  $\eta_p^2 = .021$ ,  $p = .18$ , or in the interaction,  $F(1, 52) = .19$ ,  $p = .67$ ,  $\eta_p^2 = .004$ ,  $p = .07$ . Therefore, Hypothesis 5b was not confirmed.

## Discussion

Do formal mentoring programs that are administered within an organization affect the results of the organization? We think that most people would answer “yes” to this question. Therefore, if we wish our actions to be in accordance with the response, the next step is to define the variables that will allow us to determine whether or not such a program really affects the results. And, subsequently, to take measurements in order to verify that changes are produced that justify the efforts of administering a program and demonstrating its efficacy. In our program, we have tried to verify the efficacy by means of diverse hypothesis and with diverse results.

Firstly, we should be able to show that there were significant improvements in the participants’ knowledge of academic setting. Mentors and mentees increased their knowledge, they learned about diverse aspects related to the specialty, job opportunities, job hunting in the diverse spheres of Work Psychology, etc. In view of the results obtained, it seems that the mentors gained more benefits from the program, perhaps because they prepared specifically for their role in it, developing the contents of the sessions, transmitting them, and perhaps, increasing their levels of responsibility and maturity. Whereas both mentors and mentees obtained significant gains, the non-mentors only obtained moderate gains, and the non-mentees did not present any increase in their knowledge of the academic setting.

Secondly, as reported by other authors (Allen et al., 1999; Kelly & Schweitzer, 1997; Linnehan, 2001; Tenenbaum et al., 2001), the mentors achieved a higher academic

performance, which is a positive benefit and a reward for the students. However, it is necessary to replicate these results in different samples and to control other variables that may have an impact. For example, participants’ mean grade in subject matters, both related and unrelated to the specialty of Work Psychology, before and after application of the program, could be collected.

Thirdly, the students who participated in the program did not express higher career satisfaction. One possible explanation could be the operationalization of this variable in a single item. An instrument that better reflects the complexity of the construct could show the true effect of the program on career satisfaction. However, it might be more pertinent in future studies to assess satisfaction with the specialty of Work Psychology.

Efficacy from the viewpoint of the career development function was clearly reflected in the increase of knowledge.

In most of the variables related to the psychosocial function of mentoring programs, the results found do not reveal significant changes either at the between-group or at the within-group level. Therefore, our results do not corroborate the findings of other authors (Allen et al., 1999; Kelly & Schweitzer, 1997; Linnehan, 2001; Tenenbaum et al., 2001). A possible explanation for these results could be the brevity of the program (only 6 months duration), when in other settings such as the work setting, such programs are longer, approximately five years. Another plausible alternative is that the participants were in a very advanced process of labor socialization (they were 4th- and 5th-year students). Therefore, it is necessary to analyze these changes in programs of a longer duration and in students whose degree of socialization is in the first phases. Moreover, the starting levels, the mean scores in self-concept, self-esteem, and self-efficacy, were fairly high, which could explain why there were no posttest increases.

The participants’ (mentors and mentees) measurements of emotional involvement in Work Psychology were lower upon completing the mentoring program than at the beginning. A possible explanation is that the decrease in the emotional component occurs as a result of an increase in the needs facet, which leads to a more rational internalization of involvement as interest in serving a profession, that is, clarification of one’s own rules of professional action. The mentors perceived Work Psychology as more necessary than the rest of the groups, perhaps because, through the program, they observed themselves carrying out tasks that are related to the professional area.

We think that the results obtained indicate the efficacy of the program, especially with regard to career development function, which reveals the existence of benefits of implementing mentoring programs in university contexts. Nevertheless, the generalization of the results found is subject to some limitations of the sample used in this

investigation, particularly, its size. Consequently, similar assessments in other academic contexts and with larger samples are needed, in which the participants are analyzed before and after implementation of the mentoring programs in order to establish their efficacy in organizations.

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