Knowledge in the Area of Industrial and Organizational Psychology

Research among students examining the role of education, motivation and gender concerning the gap between research and practice

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Summary

Studies have shown a gap between research and practice concerning Industrial and Organizational (I/O) psychology. These deficits are caused by a lack of knowledge, non-use of knowledge, or failing to implement knowledge. It is important to close this research-practice gap. Motivation and education are important factors in closing this gap. Therefore, this study surveys which variables are related to the knowledge of I/O psychology.

A questionnaire was used to examine the influence of career identity (work centrality and upward mobility) and gender on the knowledge of I/O psychology knowledge. Furthermore testing was carried out to discover if there are gender differences in career identity. The research was carried out on two separate occasions. This made it possible to investigate the increase in knowledge of the participants. This study was conducted among 47 students of the University of Twente who were enrolled in the course ‘Introduction to Industrial and Organizational Psychology’.

Results show that gender and upward mobility are related to the knowledge of I/O psychology. Work centrality, upward mobility and gender are not related to the enlargement of I/O knowledge. Gender differences in career identity cannot be supported. Suggestions are made for future research.
1. Introduction

Several studies show that human resource professionals are not familiar enough with the results of Human Resource Management (HRM) and Industrial and Organizational (I/O) psychology (Rynes, Colbert & Brown, 2002; Sanders, Van Riemsdijk & Groen, 2008). Other researchers have claimed that education is an important factor in closing this gap (Dawson & Burke, 2008; Cohen, 2007; Brew, 2004). However, the way in which this education is to be carried out is not clear yet. Kaplan (1989) states that students already need to gain knowledge about current research at school in order to minimize this gap. Furthermore they need to learn how to apply this knowledge in practice (Pfeffer & Fong, 2002). Wren, Halbesleben and Buckley (2007), on the other hand, have declared there is a risk of decreasing the theoretical knowledge if too much emphasis is put on practice. If theory is given priority, students are not able to apply their knowledge in real-world situations anymore. This, in turn, bears students that are not well prepared for their prospective employment. Based on this discrepancy it can be said that finding the right balance between research and practice in education is difficult.

Different studies have shown that another factor plays an important role in the balance of education, namely motivation (Van den Berg, 2002; Van de Jong, Roeleveld and Webbink, 1997). Study performances are almost all a consequence of the student’s characteristics, such as motivation, and they do not depend on the schooling or the institution. In addition Harackiewicz, Carter, Lehto and Elliot (1997) report that there is a relationship between motivation and performance, and capability and achievement in college classes. On the other hand, Peekel (2010) and Witvoet (2010) could not find a relationship between two personality factors, self-efficacy and learning goal orientation, and knowledge of I/O psychology among students.

In order to examine the gap between research and practice, it is essential to know the student’s current level of knowledge. In 2002, Rynes et al. (2002) surveyed 959 HR professionals’ present knowledge about I/O psychology in the United States. The respondents were asked to answer 35 items true, false, or uncertain. The items were arranged under different topics, such as ‘management practices’, ‘staffing’, and ‘compensation and benefits’. The scores showed that the average current knowledge was moderate (57% good answers). Six years later Sanders et al. (2008) replicated this study in the Netherlands. They found a moderate level of knowledge as well (62% good answers).

Based on the studies of Rynes et al. (2002), Sanders et al. (2008), Peekel (2010) and Witvoet (2010) this study investigates the characteristics that are associated with the level of knowledge of I/O psychology. Due to finding no relation between self-efficacy, learning-goal orientation and the knowledge of I/O psychology among students (Peekel, 2010; Witvoet,
2010), this study focuses on another motivation aspect: career identity, defined as how central one’s career is to one’s identity (London, 1983), and gender differences. Motivation is defined as an internal state that affects a person to apply in specific behavior and has two perspectives. One perspective is that motivation is based on the intensity, direction and persistence of performance over time. The other perspective indicates that motivation follows a person’s needs, wants or desires (Spencer, 2006). For a long time motivation seemed to be a crucial factor in student achievement (Harris, 1940). Boekaerts and Simon (1995) and Bong (2001) found that motivation is related to self-efficacy and goal orientation. Furthermore, these two motivation constructs have had an effect on academic presentations (Bandura, 1997; Zimmerman, Bandura and Martinez-Pons, 1992; Harackiewicz, Barron, Pintrich, Elliot and Trash, 2002). In order to measure the rise, there are two points in time where the study was taken (t_0 and t_1), compared to prior studies. Between these measures students follow the course ‘Introduction to Industrial and Organizational’. The following research question arises:

‘Can career identity and gender explain the differences in student’s knowledge about I/O psychology and the increase of this knowledge?’

To answer this question it is important to take a closer look on how knowledge is acquired and through which factors this process maybe influenced.

London (1983) accentuated the importance of individual characteristics and introduced the term career motivation. The key characteristic of career motivation is career identity. According to London there are two types of career identity: work centrality, the involvement with work or paid employment (Paullay, Alliger and Stone-Romero, 1994) and upward mobility, the capacity for rising to a higher social or economic position (Dekker, de Grip and Heijke, 2002). Burke and Reitzes (1981) found a link between career identity and performance among college students. In addition, other researchers found that people with salient career identity make more effort at work (Lobel and St. Clair, 1992) and perform better on tasks (Van Knippenberg, 2000). Based upon these points it is expected that career identity is positively related to the knowledge of I/O psychology and the increase in it.

**Hypothesis 1. Career identity is positively related to knowledge of I/O psychology (a) and is positively related to an increase of I/O knowledge at t_1 compared to t_0 (b).**

Another factor that could influence the acquisition and the increase of knowledge is gender. For decades researchers have been interested in gender differences in school performance. Tyler (1964) suggested that girls lag behind boys in career development, especially at college level. An explanation here for is that girls are organized in a different way (Harmon, 1975). Other researchers found significant gender differences in science attitudes and perceptions of science courses and careers (Jones, Howe and Rua, 2000). In
addition they found that males are more interested in extracurricular experiences and earning a high salary whereas females want ‘to help others’ rather than earning lots of money. Concepts that are associated with learning processes include learning styles, approaches to studying, cognitive styles or learning strategies (Severiens and Ten Dam, 1994). The main difference they found is that men often have a deep approach to learning. This is in contrast with women who are more interested in learning for learning’s sake. This indicates that men learn because they are interested in a topic and women learn in order to acquire knowledge.

Pomerantz, Altermatt and Saxon (2002) state that girls often outperform boys concerning grades across school subjects during elementary school years and into adolescence. Because girls view their performance as being informative about their abilities they enlarge their effort to do well. Boys at the opposite employ less effort, as they do not see their performance as reflecting on their abilities. There is also evidence that the academic performance of boys suffers (Dwyer and Johnson, 1997). In comparison with these great gender differences, Matthews (1991) only found moderate sex differences. Her research shows that women view other women as competitors while men compete individually with their peers. According to sex differences in competition, Gneezy, Niederle and Rustichini (2003) found a significant gender gap in competition performance. Here, men perform better than women. Moreover, men and women differ in their determination of career identity (Pas et. al, 2008). For men, the career plays a more important role in the assessment of their identity, and they seem to plan their career more and also more clearly. Women, on the other side, have not been less ambitious in planning their career and if they have set concrete career goals they seem to be more fixated on reaching these goals.

The studies explained above show different outcomes concerning gender differences on performance. Most of the studies show that females perform better at school and college. Furthermore they learn in a different way than males, which enlarges their effort to do well. Taking these outcomes into consideration, it is expected that women will score significantly higher on the I/O knowledge task and that they have a higher increase of I/O knowledge than men.

Hypothesis 2. Women score significantly higher on the I/O knowledge task (a) and they have a higher increase of I/O knowledge than men (b).

In addition, it can be expected that women score higher on career identity than men, due to being more attached to reach their career goals.

Hypothesis 3. Women score higher on career identity than men.
2. Methods

2.1 Respondents

During the first lecture of the course ‘Introduction to Industrial and Organizational Psychology’ (t₀) the questionnaire was taken from 47 respondents and during the last lecture (t₁) 22 respondents filled in the questionnaire. There were 19 students who filled in the questionnaire on both days. Seven (31.8%) of the students were men and 12 (54.5%) were women. The mean age of the students is 22.4 years. Fifteen (68.2%) respondents were of Dutch nationality, three (13.6%) of them were German, and one (4.5%) respondent was of another nationality.

Among the respondents who filled in the questionnaire on both t₀ and on t₁, there were six (27.3%) psychology students and four (18.2%) students of education science. Communication studies and business administration studies were represented each with two (9.1%) students, four (18.2%) respondents studied another course such as, technical business administration or civil engineering, and one (4.5%) respondent studied two courses.

Thirteen (59.1%) respondents stated that they had few friends who are psychologists or study psychology. Four (18.2%) stated that they had no friends who studied psychology, and two (9.1%) respondents said that about half of their friends are psychologists or study psychology. When the same question was regarded to family members who study psychology or are psychologists, 16 (72.7%) respondents answered with nobody and three (13.6%) with few.

2.2 Procedure

The respondents were asked to fill in the questionnaire during the first lecture (t₀) of the course ‘Introduction to Industrial and Organizational Psychology’ as well as during the last lecture (t₁). In order to thank the students for their cooperation an iPod shuffle was raffled among the respondents. Anonymity was provided.

2.3 Instrument

The research makes use of two different questionnaires. The first questionnaire contains items about the knowledge of I/O psychology. The other one includes items about career identity. Furthermore, demographic variables, such as gender, nationality, year of birth, current study, faculty, course grade, degree of interest in the topics of I/O psychology, and possible psychologists or psychology students among their family and friends have been taken into consideration.

The first part of the questionnaire about the knowledge of I/O psychology contains 25 items. The items are taken from the Sanders et al. (2008) questionnaire. These items are
divided into five dimensions: ‘Management Practices’ (6 items), ‘Staffing’ (7 items), ‘General Employment Practices’ (5 items), ‘Compensation and Benefits’ (3 items), and ‘HR Development’ (4 items). The items were answered true or false. Examples of items are: ‘Leadership training is ineffective because good leaders are born, not made’ and ‘Most managers give employees lower performance appraisals than they objectively deserve’. The reliability of this questionnaire is .60 (Cronbach’s alpha).

The second part of the questionnaire includes statements about the career identity, work centrality and upward mobility, based on the career motivation questionnaire adapted from the work of London (1983). Examples of these items are: ‘I like to have work were I am proud of’ and ‘Work is just a way to earn money’. The statements are answered on a five-point scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree).

A factor analysis was conducted to investigate the career identity scale. Three factors emerged which account for almost 68.4% of the variance in all variables (Table 1). Factor 1 contains items, which deal with work centrality (factor work centrality). The second factor contains items, which can be summarized to upward mobility (factor upward mobility). Factor 3 implies items, which cannot be classified in one of the other factors (factor unclassifiable). That is why they are not included in the following analyses. The correlations between the career identity factors are low (oblimin rotation).

Table 1
Factor Analysis Career Identity (rotated varimax).

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Proud of job</td>
<td>.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Job is important part of life</td>
<td>.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Pleasurable work</td>
<td>.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Job with high social status</td>
<td></td>
<td>.65</td>
<td></td>
</tr>
<tr>
<td>6. High salary</td>
<td></td>
<td>.85</td>
<td></td>
</tr>
<tr>
<td>8. Promotion as motivation</td>
<td></td>
<td>.68</td>
<td></td>
</tr>
<tr>
<td>4. Way to earn money</td>
<td></td>
<td></td>
<td>.80</td>
</tr>
<tr>
<td>7. Having a leadership role</td>
<td></td>
<td></td>
<td>.76</td>
</tr>
<tr>
<td>$\alpha$</td>
<td>.76</td>
<td>.78</td>
<td>.98</td>
</tr>
</tbody>
</table>
3. Results

3.1 Describing statistics

The percentage of correctly answered items of the questionnaire regarding the knowledge of I/O psychology from the respondents who filled in the questionnaire on t₀ and/or on t₁ can be find in Table 2. At the first point in time (t₀) the 47 respondents answered 14.4 (57.5%) of the items correctly. At t₁, the 22 respondents answered 15.6 (62.4%) of the items correctly. Furthermore the differences between the two points in time (t₁ – t₀) where the questionnaire was conducted can be obtained in Table 1, too. The total correctly replied items in the I/O psychology questionnaire on t₁ and t₀ do not differ significantly from each other, t(19) = .28, p < .05 (Table 2). (The level of significance was defined as p < .05). Nevertheless, the I/O knowledge of the students improved, about five percent, on t₁ compared to t₀.

The HRM areas Management Practices (MP), Staffing, General Employment Practices (GEP) and Compensation & Benefits (C & B) show an increase in their means on t₁ in contrast to t₀ but this rise is not significant (t(22) = 1.16, p = .26; t(22) = 0.51, p = .62; t(22) = -.21, p = .83; t(22) = 0.57, p = .58). The other area, HR Development (HRD), show a decrease in the means on t₁ in comparison to t₀. This decline is not significant as well (t(22) = -1.37, p = .19).

Table 2 shows the mean percentages of correct answers per HRM-area of the current study on t₀ and t₁, the research of Sanders et al. (2008), and the study of Rynes et al. (2002), as well. It can be seen that the mean percentages right answers for the first and last area, Management Practices (MP) and HR Development (HRD) do not differ greatly. The domain

<table>
<thead>
<tr>
<th>HRM-Area</th>
<th>t₀</th>
<th>t₁</th>
<th>t₁-t₀</th>
<th>t</th>
<th>p</th>
<th>Sanders</th>
<th>Rynes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP (6)</td>
<td>58.2</td>
<td>67.4</td>
<td>9.2</td>
<td>1.16</td>
<td>.26</td>
<td>63</td>
<td>65</td>
</tr>
<tr>
<td>Staffing (7)</td>
<td>51.1</td>
<td>58.4</td>
<td>7.3</td>
<td>.51</td>
<td>.62</td>
<td>43</td>
<td>38</td>
</tr>
<tr>
<td>GEP (5)</td>
<td>51.1</td>
<td>53.6</td>
<td>2.5</td>
<td>-.21</td>
<td>.83</td>
<td>64</td>
<td>65</td>
</tr>
<tr>
<td>C &amp; B (3)</td>
<td>55.3</td>
<td>63.6</td>
<td>8.3</td>
<td>.57</td>
<td>.58</td>
<td>66</td>
<td>49</td>
</tr>
<tr>
<td>HRD (4)</td>
<td>77.7</td>
<td>71.6</td>
<td>-6.1</td>
<td>-1.37</td>
<td>.19</td>
<td>80</td>
<td>71</td>
</tr>
<tr>
<td>Total (25)</td>
<td>57.5</td>
<td>62.4</td>
<td>4.9</td>
<td>.28</td>
<td>.78</td>
<td>61</td>
<td>56</td>
</tr>
</tbody>
</table>

p < .05
level *Staffing* shows higher mean percentages for the present study at t₀, as well as on t₁, comparing the researches of Sanders et al. (2008) and Rynes et al. (2002). The mean percentages of correctly answered items, for the area *General Employment Practices (GEP)*, are lower for the current study, t₀ and t₁, than for the other two studies. The contemporary research shows higher mean percentages of the domain level *Compensation & Benefits (C & B)* on t₀ and t₁, than the study of Rynes et al. (2002), but lower ones comparing the study of Sanders et al. (2008). The mean percentage of the present study at t₁ is similar to the Rynes et al. (2008) research. The mean percentage of total number of items answered correctly in the questionnaire on t₀ and t₁ is somewhat higher comparing the research of Rynes et al. (2002), and it is almost the same as that taken in the study of Sanders et al. (2008) into consideration.

3.2 Correlations

In order to see which variable has impact on the level of knowledge, a correlation matrix is made (Table 3). Gender is significantly related to number of family members, who are psychologists or studied psychology (r = .35; p < .05). This reveals that women have more psychologists or psychology students in their network than men. As the table indicates, there is a significant negative relation between age and work centrality (r = -.29; p < .05). This indicates that how older the respondents are they score less on work centrality. In addition, the knowledge on t₀ is significantly correlated to the number of friends who are psychologists or study psychology (r = -.41; p < .01) and gender (r = .38; p < .01). The more psychologists or psychology students are in the network of the respondent, the lower he scores on the I/O knowledge task is. Furthermore, women score higher on the knowledge task at t₀ in contrast to men.

Table 3
Correlation table (N=19).

<table>
<thead>
<tr>
<th>Variables</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>22.38</td>
<td>1.96</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2. Number of friends</td>
<td>1.85</td>
<td>.51</td>
<td>.06</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3. Number of family members</td>
<td>1.11</td>
<td>.31</td>
<td>.22</td>
<td>-.04</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4. Gender</td>
<td>1.51</td>
<td>.51</td>
<td>.24</td>
<td>-.12</td>
<td>.35*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5. Work centrality</td>
<td>4.37</td>
<td>.88</td>
<td>-.29*</td>
<td>.03</td>
<td>.09</td>
<td>-.09</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6. Upward mobility</td>
<td>3.74</td>
<td>.80</td>
<td>.03</td>
<td>-.23</td>
<td>.14</td>
<td>-.06</td>
<td>.00</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7. Knowledge t₀</td>
<td>14.38</td>
<td>2.56</td>
<td>.14</td>
<td>-.41**</td>
<td>.03</td>
<td>.38**</td>
<td>-.10</td>
<td>.06</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8. Knowledge t₁</td>
<td>15.59</td>
<td>2.28</td>
<td>.21</td>
<td>-.27</td>
<td>-.11</td>
<td>.12</td>
<td>-.27</td>
<td>.22</td>
<td>.23</td>
<td>-</td>
</tr>
</tbody>
</table>

*p < .05 **p < .01
Note:
2. 1 = nobody, 2 = few, 3 = about half, 4 = many, 5 = nearly everybody
3. 1 = nobody, 2 = few, 3 = about half, 4 = many, 5 = nearly everybody
4. 1 = man, 2 = woman
3.3 Regression analyses

In order to measure the relation between the variables and the knowledge in the area of I/O psychology, regression analyses were conducted. Table (4) illustrates a general view of the regression analyses with knowledge $t_0$, knowledge $t_1$, and the difference between knowledge $t_1$ and knowledge $t_0$ as the dependent variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>$t_0$</th>
<th>$t_1$</th>
<th>$t_1-t_0$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gender</td>
<td>.40***</td>
<td>.10</td>
<td>-.03</td>
</tr>
<tr>
<td>2. Work centrality</td>
<td>-.07</td>
<td>-.26</td>
<td>-.25</td>
</tr>
<tr>
<td>3. Upward mobility</td>
<td>.23*</td>
<td>.05</td>
<td>.00</td>
</tr>
<tr>
<td>4. Knowledge t0</td>
<td>.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>.45**</td>
<td>.28</td>
<td>.34</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.20**</td>
<td>.08</td>
<td>.11</td>
</tr>
</tbody>
</table>

* $p < .10$ ** $p < .05$ *** $p < .01$

Table (4) shows that there are two variables that are significant for knowledge on $t_0$, gender ($\beta = .40; t = 2.91; p < .01$) and upward mobility ($\beta = .23; t = 1.65; p < .10$). The explained variance of this model is 20% ($R = .45; R^2 = .20; F(3, 46) = 3.57; p < .05$). Furthermore there is no variable that is significant for knowledge in $t_1$. The predictability of this model is low ($R = .34; R^2 = .11; F(3, 18) = .43; p = .74$).

Facing $t_0$, only one factor of career identity has a positive significant impact, upward mobility ($\beta = .23; t = 1.65; p < .10$), which is positively related to the knowledge in I/O psychology on $t_0$, and work centrality ($\beta = -.07; t = -.53; p = .60$), which slightly predicts negatively the knowledge on $t_0$. Stating the fact that there is only one factor that has a significant impact on the increase of knowledge, upward mobility, hypothesis 1a can only be slightly accepted. It was expected that career identity as a whole is positively related to the knowledge of I/O psychology. These factors also do not predict the increase of knowledge on $t_1$, work centrality ($\beta = -.16; t = -.66; p = .52$) and upward mobility ($\beta = -.11; t = -.45; p = .66$), which negatively predicts the knowledge. As a result, hypothesis 1b is also not confirmed; career identity is not positively related to an increase of knowledge.

Gender is significantly related to the knowledge at $t_0$ ($\beta = .40; t = 2.91; p < .01$). On the second point of measure, gender is not significantly related to an increase of knowledge ($\beta = -.35; t = 1.44; p = .17$). Rather, it negatively predicts the increase in I/O knowledge. The
results imply that hypothesis 2a is accepted; women score higher on I/O psychology knowledge. Hypothesis 2b on the other hand, cannot be confirmed. There are no gender differences in the increase of knowledge.

Table 5 shows that gender has no significant impact on career identity. Hypothesis 3 cannot be confirmed. It was expected that women score higher on career identity than men. Gender predicts more negatively the scores on career identity.

Table (5)
Results regression analysis with work centrality and upward mobility as dependent variables (N=47).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Work centrality</th>
<th>Upward mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-0.08</td>
<td>-0.10</td>
</tr>
<tr>
<td>R</td>
<td>0.08</td>
<td>0.10</td>
</tr>
<tr>
<td>R²</td>
<td>0.01</td>
<td>0.01</td>
</tr>
</tbody>
</table>
4. Discussion

In this research the knowledge students have about I/O psychology was tested and the effect of education was measured as well. To meet these purposes, the knowledge was assessed by means of questionnaires, which were implemented at two points in time: during the first lecture ($t_0$) and the last lecture ($t_1$) of the course ‘Introduction to Industrial and Organizational Psychology’.

**Current level of knowledge**

According to the current level of knowledge, this study shows that the mean scores of the correct answers of the students are more or less similar to the percentage correct answers of the HR managers (Rynes et al., 2002; Sanders et al., 2008). It was noticeable in the current research that the mean percentage of right answers for the area *Staffing* on $t_0$ as well as on $t_1$ are higher than the percentages of the HR managers. On the basis of the research of Rynes et al. (2002) there can be three different reasons for these findings. Firstly it is possible that literature on the area of staffing is more technical than on other domains. That is why HR managers probably read less such literature and students more often read it because it is included in the learning matter and students are more inquisitive than HR managers. Another reason could be that, according to Rynes et al. (2002), students are more theoretically trained and thus score better on the area *Staffing*. HR managers, on the other hand, are more practically oriented and look at this domain differently with different things being more important to them (Emans, 2004). The third reason for the different scores on the domain *Staffing* resides in the negative reportage that intelligence and ability tests continue to receive in the popular press (Rynes et al., 2002; Goleman, 1998). Such reports are more accessible to HR managers. It is possible that students appreciate intelligence and ability tests more, due to the whole reading material they have from the university. It seems that this material is more positive reported.

**Increase level of knowledge**

Concerning the effect of education it is obvious that there has been an increase in the knowledge of I/O psychology. Furthermore, there has been an increase in the sub domains: *Management Practices*, *Staffing*, and *Compensation and Benefits* as well. A possible explanation for this could be that the focus of the lectures has been on these domains. The mean percentages of correct answers of the HRM area *HR Development* decreased on $t_1$ in contrast to $t_0$. Werner and DeSimone (2009) state that the focus of human resource development (HRD) is put on workplace learning and performance. Furthermore, HRD seeks to develop people’s knowledge and expertise for personal or group gain, or for the profit of an organization. Stewart and McGoldrick (1996) present that HRD is implicit in organizations and is also concerned with leadership, organizational learning and development. This
indicates knowledge that students cannot develop because they are not working in an organization or company yet. The mean scores of the last domain, *General Employment Practices*, remained constant.

**Hypotheses concerning relations with knowledge (1a and 2a)**

The first part of the research dealt with the parts of the hypotheses that career identity and gender are positively related to the knowledge of I/O psychology. The first part of hypothesis 1 has been accepted to some extent. Out of two parts of career identity, only upward mobility is related to the knowledge of I/O psychology. These findings support the research results of Ellis and Lane (1963), who find clear evidence that students are engaged in the process of upward mobility in order to achieve a high university status. According to Turner (1960) the motivator for upward mobility among students is the achievement of an elite status at the university. He states that students live in an open contest with their fellow students and make every effort to keep them from lagging in the race. This statement confirms the outcomes of the first part of hypothesis 1. An explanation as to why no relationship is found between the other part of career identity, work centrality, and knowledge on the area in I/O psychology, could be that work centrality is related to intrinsic and social rewards, with the strongest relationship with intrinsic rewards (Mannheim, 1975). Maybe the students were not satisfied enough with studying that day or they did not do a job well and were thus not satisfied with their personal achievement.

The first part of the second hypothesis is also accepted; gender is positively related to the knowledge of I/O psychology. This would indicate that women score better than men. As expressed by Pomerantz, Altermatt and Saxon (2002), women often outperform men concerning school subjects and university grades. Matthews (1991) stated that women view other women as competitors while males compete individually with their peers. Due to having a few more female participants, there were more female competitors than male competitors. So this could be an explanation why women score significantly higher on the I/O knowledge.

**Hypotheses concerning the increase in knowledge (1b and 2b)**

The hypotheses that are relevant to the effect of variables, on the increase of knowledge of I/O psychology, have all been not confirmed. Neither career identity nor gender are related to the increase in knowledge. If the explanation concerning hypothesis 1 above is relevant, it is not clear why it is inappropriate for the second part of the hypothesis. A factor in not finding a relation between career identity as a whole and the knowledge of I/O psychology (and the increase) could be that young people do not have clear-cut occupational ambitions, and in cases where they do have them, they change all the time (Meijers, 1998; Coleman, 1989). According to this point, the course is given at the beginning of the second study year. For most of the students it is the first time they have been in contact with this field of study. The year before they have learnt a lot about the basic elements of psychology. At
the time the study took place they were still deciding which specialization area they found the most interesting.

It was remarkable that gender is not positively related to the increase of knowledge, due to having a result at t0 that is even at a significant level of \( p < .01 \) positively related to the I/O knowledge. This implies that male and female knowledge of I/O psychology increases at about the same amount.

**Hypothesis concerning the gender differences in career identity (3)**

The last part of this research dealt with gender differences in career identity. Hypothesis 3 cannot be confirmed. This outcome confirms research results of Lobel and St. Clair (1992). They found no gender differences concerning identity salience. An explanation why women do not score higher on career identity could be that women are less work-centered than men (Mannheim, 1993). Moreover, women assign less importance to work centrality than do men (Harpaz and Fu, 1997). Nkomo and Taylor (1989,) support the outcomes above concerning upward mobility. They did not find gender differences in upward mobility.

**Limitations**

This research had some limitations. The sample size was small; 47 participants filled in the questionnaire on t0, 22 filled it in on t1, and there have been only 19 participants who filled in the questionnaire on both times. There were only 9 participants who had an increase in the correct answers of knowledge of I/O psychology on t1 in contrast to t0.

Moreover, it was noticeable that the percentage of correct answers from the whole questionnaire and the different HRM-areas of the students did not differ much from the percentages of HR managers of the researches of Rynes et al. (2002) and Sanders et al. (2008). It was expected that the HR manager’s scores would have been higher than the student’s scores because they use their I/O knowledge daily.

**Conclusion**

This research shows that there are gender differences in the knowledge of I/O psychology but not in the way this knowledge increases. Furthermore, there is only one factor of career identity that has an influence on the I/O psychology knowledge but not on the increase of it. In addition, there are no gender differences in career identity. There could be a follow-up study, which examines the gender differences between students who choose to specialize in I/O psychology, later in their study, and students, psychology and non-psychology, who do not choose this specialization.
5. References


