

Badania i Rozwój Młodych Naukowców w Polsce

Psychologia i socjologia



www.mlodzinaukowcy.com

Poznań 2016

Redakcja naukowa

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dr Jędrzej Nyćkowiak

Skład i łamanie tekstu

mgr Izabela Majorczyk

Wydawca

Młodzi Naukowcy

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ISBN (całość) 978-83-65362-13-1

ISBN (wydanie online) 978-83-65362-72-8

ISBN (wydanie drukowane) 978-83-65677-01-3

Ilość znaków w książce: 620tys.

Ilość arkuszy wydawniczych: 15.5

Niniejsza pozycja jest monografią naukową.

Wszystkie teksty przeszły proces recenzji – spis recenzentów zamieszono na końcu książki.

Prace zostały wydrukowane zgodnie z przesłanym tekstem, na odpowiedzialność ich autorów.

5. Moderating effect of emotions on the relationship between learning competencies and meaning in life among university students

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Keywords: pleasure of learning, self-efficacy in learning, emotions, meaning in life

Abstract

The aim of this study was to examine if emotions moderate the relationship between learning competences and the meaning in life. Learning competences have two components: the first one is the knowledge and abilities how to learn effectively with subjective sense of self-efficacy in learning, second involves positive attitude associated with drawing pleasure from learning. Meaning in life is defined as a sense of one's life having a purpose or investing time and energy into the attainment of cherished goals. The sample consisted of 245 university students (151 women, 88 men, 6 people did not report gender). Mean age was $M = 21.39$ years ($SD = 2.04$). Valid and reliable psychometric tools were applied. Hypotheses were partially confirmed. Positive emotions moderated the relationship between learning competences and meaning in life. On the other hand negative emotions did not moderate the relationship between learning competences and meaning in life. The results showed that learning competencies are positively related to meaning in life if they are accompanied by higher positive emotions. The potential implications of the results in the context of healthy and unhealthy learning attitudes are discussed.

1. Introduction

The knowledge-based economy is defined by OECD (1996) as an economy based on production, distribution and use of knowledge and information in practice. It concentrates on human capital understood as qualified employees. The competences related to fast learning, efficient information processing and using information for solving practical problems are increasingly more often the subject of current research.

Learning competences have two components: first is a knowledge and abilities to learn effectively with subjective sense of self-efficacy in learning, second involves positive attitude associated with drawing pleasure from learning (Atroszko 2013). When learning constitutes a major part in individuals' lives, it is important to see how it can contribute to one's meaning in life, that is often defined as a sense of one's life having a purpose or investing time and energy into the attainment of cherished goals (Ryff & Singer 1998).

Studies show that subjective sense of meaningful life positively relates to well-being and positive functioning (King 2006). Past research also suggested that it is primarily acquired via interactions and relationships with other people in the context of culture and that the general need for meaning in life can be broken down into four basic needs: purpose, values, efficacy, and self-worth (MacKenzie & Baumaister 2014). Kelly (1983) suggested that people derive meaning from investment in their roles in life, therefore these four needs may be fulfilled in the field of learning, especially in the context of knowledge based economy. In the learning-related area of life students evolve their self-worth, self-efficacy and global sense that they become a person who have competence to face the requirements of the environment. In the context of lifespan learning that would affect not only school or university students, but also adults working professionally.

According to the broaden-and-build theory created by Fredrickson (1998), positive emotions broaden individual's momentary thought-action repertoires, which in turn has the effect of building individual's physical, intellectual and social resources. Previous series of

studies showed that positive emotions give rise to an enlarged cognitive context and enable creative problem solving (Isen et al. 1987). Furthermore, positive emotions broaden a scope of attention by remolding individual's processing to global rather than local focus (Fredrickson 2004). Negative emotions narrow persons repertoires to two very adaptive but impoverished fight-or-flight responses. Thus experiencing negative emotions can constrict thought-action repertoires by urging to act in specific action tendencies (Lazarus 1991). This theoretical and empirical context leads to creating a promise that positive emotions derived from learning facilitate person recognizing and experiencing meaning in life by broadening cognitive context and allowing to associate this experience to a larger system of meaning. Contrary to this process, experiencing negative emotion can impede person realizing that his or her life has significance and purpose.

On the basis of previous research and theoretical frameworks it is hypothesized that: positive emotions moderate the relationship between pleasure of learning and meaning in life (H1); with high level of positive emotions the relationship between pleasure of learning and meaning in life is positive (H1a); with low level of positive emotions there is no relationship between pleasure of learning and meaning in life (H1b); positive emotions moderate the relationship between self-efficacy in learning and meaning in life (H2); with high level of positive emotions relationship between self-efficacy in learning and meaning in life is positive (H2a); with low level of positive emotions there is no relationship between self-efficacy in learning and meaning in life (H2b); negative emotions moderate the relationship between pleasure of learning and meaning in life (H3); with high level of negative emotions there is no relationship between pleasure of learning and meaning in life, (H3a); with low level of negative emotions there is positive relationship between pleasure of learning and meaning life; negative emotions moderate the relationship between self-efficacy in learning and meaning in life (H4); with high level of negative emotions there is no relationship between self-efficacy in learning and meaning in life (H4a); with low level of negative emotions there is positive relationship between self-efficacy in learning and meaning in life (H4b).

2. Methods

Participants. Two hundred forty five students took part in this study: 151 women (61.6%), 88 men (35.9%), 6 people (2.4%) did not report gender. The mean age of the sample was $M = 21.39$ ($SD = 2.04$). Participants were from different universities (University of Gdańsk, Koszalin University of Technology), as well as faculties (psychology, IT, mechatronics, criminology), and modes of study.

Measures. One of the tools used in the research was Multidimensional Inventory - Learning Profile of a Student (MI-LpoS) (Atroszko 2013), which assesses the learning-related behaviors, attitudes, feelings and beliefs. Respondents provided answers on a five-point Likert scale, from (1) very rarely to (5) very often. It showed adequate reliability and validity, as well as good psychometric properties in previous research (Atroszko 2015). In this paper the results from two subscales are presented, (learning-related) Pleasure and Self-Efficacy with Cronbach's alpha reliability of .87 for Pleasure and .82 for Self-Efficacy.

Emotions were measured with Scale for the measurement of mood and six emotions (Wojciszke & Baryła 2005), a scale used to measure six emotions, namely two positive: happiness and affection, and four negative: fear, anger, guilt and sadness. It consists of 24 adjectives describing discrete emotions, four for each basic emotion. The response alternatives range from (1) never to (7) always, meaning how often these emotions occur. It showed good validity and reliability. For the present sample the Cronbach's alpha reliability coefficient was .86 for positive emotions and .93 for negative emotions.

Meaning in life was measured with ultra-brief scale (Atroszko et al. 2015) based on item from WHOQOL Brief scale. It is a single-item measure with 9-point Likert response scale, from (1) not at all to (9) an extreme amount. The item which measured meaning in life was "To what extent do you feel your life to be meaningful?". It showed good psychometric

properties in previous research (Atroszko et al. 2015). Intraclass correlation coefficient was .86.

Procedure. Data collection used convenience sampling. Students were invited to participate anonymously in the study during lectures or classes, more than 90% agreed to do so. Participation in the study was totally anonymous and no monetary or other material rewards were offered.

Statistical analyses. Means, standard deviations, percentages and correlation coefficients were calculated. Four hierarchical regression analyses were conducted. Four interaction terms were created: between pleasure and positive emotions, self-efficacy and positive emotions, pleasure and negative emotions, and between self-efficacy and negative emotions. Meaning in life was dependent variable. In all models independent variables added in the first step were sex and age. Second step included two variables: positive emotions and pleasure (first model), positive emotions and self-efficacy (second model), negative emotions and pleasure (third model) and negative emotions and self-efficacy (fourth model). In the third step only interaction term proper for the model was added. Six benchmarks were set: three for positive and three for negative emotions based on mean score and standard deviation: mean score, mean score minus one standard deviation, and mean score plus one standard deviation. Tests of significance of regression slopes at these benchmarks were conducted. All tests were two-tailed, and the significance level was set to $\alpha = .05$. Unstandardized regression coefficients were reported Bootstrap method with bias corrected 95% confidence intervals and 10,000 bootstrap samples was used. All statistical analyses were conducted in IBM SPSS 23.

3. Results

Table 1 presents mean scores, standard deviations and percentages for the study variables as well as interrelationships between them.

Tab. 1 Mean scores and standard deviations, percentages, and correlations between the study variables.

| | <i>M (SD)/%</i> | 2 | 3 | 4 | 5 | 6 | 7 |
|---------------------|-----------------|------|-----|------|--------|--------|--------|
| 1 Age | 21.39 (2.04) | .16* | .08 | .13* | .10 | .02 | .06 |
| 2 Sex ^a | 36% <i>men</i> | | .09 | -.08 | -.25** | .02 | -.17* |
| 3 Self-efficacy | 16.58 (4.09) | | | .54 | .23** | -.16* | .28** |
| 4 Pleasure | 9.46 (3.75) | | | | .01 | .14* | -.17** |
| 5 Positive emotions | 4.72 (1.16) | | | | | -.29** | .51** |
| 6 Negative emotions | 2.93 (1.15) | | | | | | -.38** |
| 7 Meaning in life | 5.74 (2.16) | | | | | | |

^a0 = *women*, 1 = *men*.

* $p < .05$, ** $p < .01$.

In the first model the regression analysis for meaning in life showed that the independent variables added in step 1 explained 3.4% of the variance ($F_{2,226} = 3.92, p < .05$). Two independent variables added in step 2 explained 26.5% of the variance ($F_{2,226} = 42.39, p < .01$). Interaction term added in step 3 explained 1.4% of the variance ($F_{1,223} = 4.65, p < .01$). The independent variables explained a total of 31.2% of the variance of meaning in life ($F_{5,223} = 20.34, p < .001$) (see Table 2).

Fig. 1 shows interaction plot. Conditional effect of focal predictor (learning-related pleasure) at benchmark values of the moderator variable (positive emotions) showed that for high positive emotions there was positive and statistically significant relationship between pleasure of learning and meaning in life ($B = .16, p < .001, 95\% \text{ CI } [.07, .24]$), also there was statistically significant relationship between these variables for mean positive emotions ($B =$

.09, $p = .007$, 95% CI [.02, .15]) and there was no relationship for low positive emotions ($B = .02$, $p = .066$, 95% CI [-.07, .11]).

Also second model was statistically significant. The regression analysis showed that sex and age added in step 1 explained 3.4% of the variance ($F_{2,226} = 3.92$, $p < .05$). Two independent variables added in step 2 explained 26.9% of the variance ($F_{2,224} = 43.30$, $p < .01$). Interaction term added in step 3 explained 1.2% of the variance ($F_{1,223} = 3.75$, $p < .05$). The independent variables explained a total of 31.5% of the variance of meaning in life ($F_{5,223} = 20.46$, $p < .001$) (see Table 2).

Tab. 2 Results of hierarchical multiple regression analyses in which age, sex, emotions (positive and negative), learning competencies (pleasure and self-efficacy), and interactions were regressed upon the scores on quality of life (unstandardized regression coefficients are reported).

| Step | Predictor | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
|-------------|-------------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|
| | | <i>B</i> | ΔR^2 | <i>B</i> | ΔR^2 | <i>B</i> | ΔR^2 | <i>B</i> | ΔR^2 |
| 1 | Age | .11 | .034 | .11 | .034 | .11 | .034 | .11 | .034 |
| | Sex ^a | -.79* | | -.79* | | -.79* | | -.79* | |
| 2 | Age | .01 | .265 | .03 | .269 | .07 | .180 | .09 | .197 |
| | Sex ^a | -.01 | | -.21 | | -.70* | | -.87** | |
| | Positive emotions | .98** | | .88** | | | | | |
| | Negative emotions | | | | | -.77** | | -.65** | |
| | Pleasure | .09** | | | | .12** | | | |
| 3 | Self-efficacy | | | .10** | | | | .13** | |
| | Age | .00 | .014 | .02 | .012 | .07 | .002 | .09 | .000 |
| | Sex ^a | -.03 | | -.25 | | -.68* | | -.87** | |
| | Positive emotions | .44 | | .04 | | | | | |
| | Negative emotions | | | | | -.58 | | -.65 | |
| | Pleasure | -.19 | | | | -.17 | | | |
| | Self-efficacy | | | -.14 | | | | .13 | |
| | Interaction | .06* | | .05* | | .02 | | .00 | |
| Total R^2 | | | .313 | | .315 | | .215 | | .230 |

^a0 = women, 1 = men.

* $p < .05$, ** $p < .01$

Interaction plot is showed in fig. 2. Conditional effect of focal predictor (self-efficacy) at chart values of the moderator variable (positive emotions) showed that there was statistically significant relationship between self-efficacy in learning and meaning in life for high level of positive emotions ($B = .16$, $p = .001$, 95% CI [.07, .24]) and for mean positive emotions ($B = .10$, $p = .002$, 95% CI [.02, .15]). There was no relationship for low positive emotions ($B = .02$, $p = .066$, 95% CI [-.04, .12]).

In the third model regression analysis showed that in the first step two independent variables explained 3.4% of the variance ($F_{2,223} = 3.92$, $p < .05$). Variables added in the second step explained 18.0% of the variance ($F_{2,224} = 25.59$, $p < .05$). Interaction was added in step 3 and it was statistically non-significant.

Interaction plot is showed in fig. 3. Conditional effect of focal predictor (pleasure) at chart values of the moderator variable (negative emotions) showed that there was positive relationship between pleasure of learning and meaning in life for high level of negative emotions ($B = .10$, $p = .006$, 95% CI [.01, .18]), for mean negative emotions ($B = .12$, $p = .001$, 95% CI [.05, .19]) and for low negative emotions ($B = .14$, $p = .006$, 95% CI [.04, .24]).

Regression analysis in the fourth model showed that in the step 1 two independent variables explained 3.4% of the variance ($F_{2,223} = 3.92$, $p < .05$). Self-efficacy and negative emotions added in step 2 explained 19.7% of the variance ($F_{2,224} = 28.64$, $p < .01$). Interaction term added in step 3 was statistically non-significant.

Interaction plot is showed in fig. 4. Conditional effect of focal predictor (self-efficacy) at chart values of the moderator variable (negative emotions) showed that there was positive

relationship between self-efficacy in learning and meaning in life for high level of negative emotions ($B = .13, p = .002, 95\% \text{ CI } [.05, .21]$), for mean negative emotions ($B = .13, p < .001, 95\% \text{ CI } [.06, .19]$) and for low negative emotions ($B = .13, p = .005, 95\% \text{ CI } [.03, .22]$).

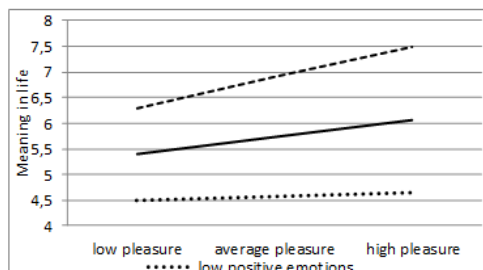


Fig. 2. Moderating effect of positive emotions on the relationship between pleasure and meaning in life.

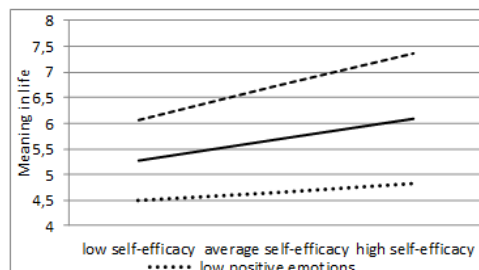


Fig. 2. Moderating effect of positive emotions on the relationship between self-efficacy and meaning in life.

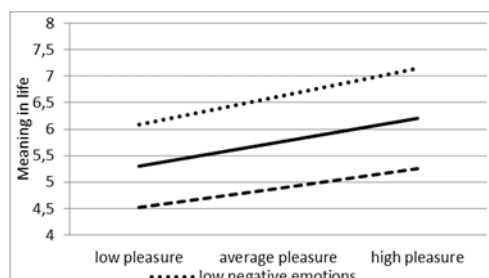


Fig. 3. The effect of negative emotions on the relationship between pleasure and meaning in life.

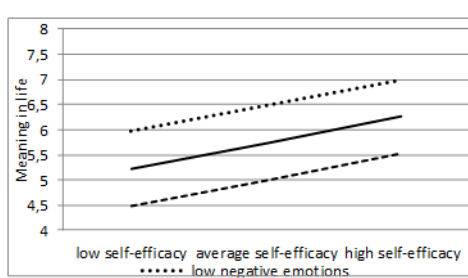


Fig. 4. The effect of negative emotions on the relationship between self-efficacy and meaning in life.

4. Discussion

Hypotheses 1 and 2 were confirmed. Positive emotions moderated the relationship between pleasure of learning and meaning in life. The higher the level of positive emotions, the stronger positive relationship between the pleasure of learning and meaning in life was. However, in the group with low level of positive emotions there was no significant relationship between pleasure of learning and meaning in life. Also, positive emotions moderated the relationship between self-efficacy in learning and meaning in life, in the same way as in the case of pleasure. According to the obtained results, with higher learning competences experiencing positive emotions may contribute to the individuals' general sense of meaning life. That would confirm the assumption that positive emotions would help individuals to associate learning with a larger system of meaning.

Hypotheses 3 was not confirmed. Negative emotions did not moderate the relationship between pleasure of learning and meaning in life. Moreover, hypotheses 4 was also not confirmed. Negative emotions did not moderate the relationship between self-efficacy in learning and meaning in life. This could be related to the emotion regulating mechanisms of recently identified phenomenon of study addiction (Atroszko et al. 2015). Study addiction can be defined as being overly concerned with studying, being driven by an uncontrollable studying motivation, and to put so much time and effort into studying that it impairs private relationships, spare-time activities, and/or health (Atroszko et al. 2015). Previous research showed that study addiction is positively related to dysfunctional perfectionism, pleasure derived from learning, getaway from personal problems into learning, and experiencing

negative emotions (Atroszko 2015). Moreover pleasure in learning was positively related to experiencing negative emotions, specifically fear and shame (Atroszko 2015). Systematic studies provided substantial support for the validity of the model of study addiction as a dysfunctional way of coping with stress (Atroszko 2015) suggesting that individuals who study compulsively initially tend to get away from negative emotions into the pleasure of learning and that this process might be driven by the need to find purpose in life. This could to some extent explain why the results of the present study showed positive relationship between learning competences and meaning in life on all levels of negative emotions. Those who frequently feel negative emotions and have high learning self-efficacy might more often override these affective states with pleasure of learning, and this could increase their sense of meaning in life, at least initially.

Considering the positive relations between meaning in life and general well-being (King 2006), the results show the importance of developing positive attitudes towards learning among students. In particular, they show that when accompanied by positive emotions, learning competences increase sense of meaning in life. The aim of promoting positive attitudes towards leaning should be accomplished within educational system, and this study shows that more emphasis should be put on attaining this goal.

To the authors' knowledge, this is the first research investigating the moderating effect of emotions on the relationship between learning competences and meaning in life. The measures used in the study were standardized and showed satisfactory psychometric properties. Still, the present study has some limitations. Since the data was obtained by self-reporting method, the results may suffer from general weakness related to this methodology. Also, the sample was relatively small. All study participants were university students, therefore, the results may be generalized to the population with some reservation. Moreover, the study was cross-sectional, thus it is impossible to clearly identify causes and effects.

Future studies should overcome these limitations. Moreover, the potential role of study addiction and emotion regulatory processes related to it should be investigated in relation to learning competences and meaning in life. Another issue is to investigate which specific emotions are related to particular competences.

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