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**The Associations Among Meaningfulness in Life, Basic Psychological
Need Satisfaction, and Internal Motivation in the Scholarly Activities
of Doctoral Students**

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Abstract

In the conditions of reforming higher education in Russia it is important to follow how those new conditions are influencing the motivation for scholarly activity of doctoral students. In the present study, 112 doctoral students from natural science departments at Kazan University (Russia) identified the level of meaningfulness of life, satisfaction of basic psychological needs and predominance of external versus internal motivation in their academic/scholarly activity. Results showed a direct link between meaningfulness of life and basic psychological need satisfaction for autonomy, competence and relatedness, and an inverse association with internal motivation for academic/scholarly activity. Doctoral students with a lower level of meaningfulness in life showed a higher level of internal motivation for their scholarly activities and significantly lower levels of psychological need satisfaction, whereas those for whom the level was higher, motivation was more external. This suggests that the presence of goals in life, emotional fullness in life, and satisfaction with its results and control over it among the present sample of doctoral students was not associated with academic and scientific contexts. The results allow the clarification of substantial aspects of the problem of organizing education at the higher levels.

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Keywords: education, doctoral students, internal motivation, academic-scholarly activity, self-determination, psychological needs, meaningfulness of life



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1. Introduction

Education is an important aspect of a person's life, and for this reason educational research does not bypass the problem of life meaning and the role of meaning regulation. Some indeed speak about the meaning of life as the goal of education (White, 2009). The search for meaning in life takes place during one's years as a student at various stages of education (De Vogler & Ebersole, 1980; Elexpuru Albizuri, Villardón Gallego & de Eulate, 2013).

The role of the category of meaning in life, which entered into psychology through the work of V. Frankl (1963), has not been exhausted in contemporary scientific interest. Elaboration of the theoretical construct itself is ongoing: new models of meaning in life are being created (Leontiev, 2003; Park, 2010; Wong 2014) and its determinants, too (Glazer, Kozusznik, Meyers & Ganai, 2014). Empirical studies are identifying the role of meaning in life for people of various ages (Morgan & Robinson, 2013), its associations with meaning of work and vocation (Dik, Duffy, & Eldridge, 2009; Duffy, Allan, Autin & Bott, 2013), with conscientiousness (Lightsey, Boyraz, Ervin, Rarey, Gharghani & Maxwell, 2014), with values (Dezutter et al., 2014), with positive affect and future time perspective (Hicks, Trent, Davis, & King, 2012), with the discrepancies between importance and attainability of certain values (Salikhova, 2015), with self-concept (Shin, Steger & Henry, 2016), with psychological time of personality (Salikhova, 2014), and with hope and priorities for the future (Kasler, Izenberg, Elias & White, 2012). Of interest are studies on cross-cultural distinctions of life meaning (Ohbuchi et al., 1999; Woldu & Budhwar, 2011). Under investigation is the influence on meaning in life of situational variables such as prosocial behavior (Klein, 2017), visualizations of future events (Vess, Hoeldtke, Leal, Sanders & Hicks, 2017), and income level (Ward & King, 2017).

Frankl linked the absence of meaning in life with what he called 'noogenic neurosis,' in other words psychic or psychological ill-health and ill-being. The link between meaning in life and health and well-being is a subject of contemporary investigations, as well (Brassai et al., 2011; Debats, 1996). Self-determination theory (SDT) extends and deepens this line of research and demonstrates that psychological health and well-being depend on satisfaction of basic needs, such as the needs for autonomy, competence, and relatedness (Ryan & Deci, 2000, 2017). This approach enjoys a substantial empirical basis, which confirms the link between basic need satisfaction and well-being (Compton, 2000; Weinstein & Ryan, 2010; Heintzelman & King, 2016). This influence is convincingly supported in extensive cross-cultural research (Church, Katigbak, Locke, (...) Simon & Ching, 2013). One of the central aspects of SDT is its understanding of internal or intrinsic motivation, the benefits of which, in contrast to external or extrinsic motivation, have similarly been convincingly demonstrated in numerous studies (Black & Deci, 2000; Ryan & Lynch, 2003; Vansteenkiste, Lens, & Deci, 2006).

Meaning in life is an important component of well-being. Notably, there has been some research suggesting a link between satisfaction of basic psychological needs and meaning in life (Olson & Chapin, 2010; Tiliouine, 2012; Martela, Ryan & Steger, 2017).

In addition to the construct, meaning in life, scholars have been utilizing the construct, meaningfulness of life (Leontiev, 1992; Martela, Ryan & Steger, 2017). The former applies specifically to the contents of meaning in life, whereas the latter allows for its quantitative measurement, as such.

2. Problem Statement

The higher levels of education always involve including students in scholarly work. Research activity is a creative process that relies on the internal queries of the person, which suggests it is impossible without authentically internal motivation for that activity. The history of science indicates that scholarly research is the prerogative of enthusiasts. At the present time scholarly activity has changed and is for all practical purposes becoming scholarly manufacturing in which the many are involved. For that

reason particularly relevant is the question of the motivation of those young people who are just beginning that flow in the production of knowledge. It is especially important to clarify this in Russia, where in recent years the government has been reforming the scientific sphere and the higher levels of education, and among the priorities is the development of the natural sciences as well as information technologies. However the corresponding research is absent.

3. Research Questions

Do there exist any particularities in the associations of external and internal motivation in various forms of university-related activity of doctoral students, depending on the meaningfulness of life as well as basic need satisfaction?

4. Purpose of the Study

The goal of this study was clarify the association of internal motivation for scholarly activity with the level of meaningfulness in life and of satisfaction of the basic psychological needs of doctoral students in the circumstances of contemporary higher education in Russia.

5. Research Methods

5.1. Measures

The following measures were administered.

- The Russian language version of the Purpose in Life test (PIL) - *Life-Purpose Orientations Questionnaire* (LPO). This scale includes the following parameters: goals in life (Goals), the emotional intensity of life (Process), self-actualization satisfaction (Result), locus of control (LC-Life), and general meaningfulness of life (ML) (Leontiev, 1992; Osin, 2018).
- *Psychological Need Supports* (La Guardia, Ryan, Couchman & Deci, 2000). As noted, the degree to which doctoral students experienced support for their basic psychological needs for relatedness, competence and autonomy was a key dimension of the present study. Accordingly, we explored five different interpersonal contexts: in order to tap close relationships, participants were asked to indicate need satisfaction with mother and with a friend; and in order to explore relationships within the 'space' of the university, participants reported on need satisfaction with colleagues (or peers), with their research supervisor/advisor, and 'in class.' Each need was tapped by three items, for a total of nine items, with higher scores (on a scale of 1 – 7) reflecting greater need satisfaction in that context. In the present sample, internal consistency reliabilities (alpha) for competence, relatedness and autonomy ranged from .49 to .79, .65 to .77, and .50 to .63, respectively.
- *Self-Regulation for Learning* (SRQ-L; Black & Deci, 2000). We adapted five items from this scale to the degree to which doctoral students acted with internal or autonomous motivation for their university-based activities. Specifically, three items tapped internal reasons ($\alpha = .92$), and two items tapped external reasons ($\alpha = .88$). Items were scored on a scale of 1 to 5, with higher scores reflecting more internal or more external motivation, respectively. The activities for which participants needed to rate their motivation included: "I write a scholarly text (thesis, article, etc.)," "I organize and collect data for research," "I search for and synthesize information about a research topic," "I attend a class at the university," "I discuss work with my scientific director/research advisor," "I discuss work with my colleagues / classmates." Separate composite scores were computed for internal motivation and external motivation by averaging across all six of the university-based activities.

5.2. Participants

The current research surveyed 112 doctoral students enrolled at Kazan Federal University (Kazan, Republic of Tatarstan, Russian Federation), among them 64 men and 56 women ranging in age from 22 to

34 years ($median_{age}=24$, $M_{age}=24.1$, $SD_{age}=1.8$). Students who completed the survey were from five different scientific disciplines: Mathematics and Information Technologies (18 %), Chemistry (17 %), Geology (20 %), Fundamental Medicine and Biology (30 %), Physics (18 %).

5.3. Data analytic strategy

At the first step of analysis, descriptive statistics and Pearson's correlations were computed for the full sample.

At the second step of analysis the data were divided into two contrasting groups using as the criterion the level of meaningfulness of life.: one group with the highest indicator (1st quartile) of ML (general meaningfulness of life) and the group with the lowest indicator (4th quartile) of ML. Into the first group went 29 people, and into the second went 27. Groups were compared using independent two-sample Student t-test.

6. Findings

6.1. The correlations of meaningfulness personality orientations with internal and external motivation and their discrepancy in various forms of university-related activity

Results of the correlation analysis presented in Table 01.

Table 01. [Pearson correlations of meaningfulness personality orientations with indicators of internal motivation (IM) and external motivation (EM) and their 'relative autonomy index' discrepancy (RAI) in various forms of university-related activity, sample-wide]

University activities		LPO Questionnaire's scales									
		Goals		Process		Result		LC		ML	
		r	p	r	p	r	p	r	p	r	p
I write a scholarly text (thesis, article, etc.)	IM	-.28	.002	-.21	.028	-.27	.004	-.17	.072	-.25	.007
	EM	.41	.000	.44	.000	.26	.005	.27	.005	.43	.000
	RAI	-.46	.000	-.42	.000	-.36	.000	-.29	.002	-.45	.000
I organize and collect data for research	IM	-.18	.064	-.10	.306	-.23	.015	-.12	.199	-.14	.150
	EM	.30	.001	.38	.000	.24	.010	.22	.018	.36	.000
	RAI	-.30	.001	-.29	.002	-.31	.001	-.29	.020	-.31	.001
I search for and synthesize information about a research topic	IM	-.37	.000	-.23	.015	-.35	.000	-.18	.053	-.30	.001
	EM	.25	.007	.37	.000	.22	.017	.29	.002	.37	.000
	RAI	-.42	.000	-.40	.000	-.39	.000	-.31	.001	-.44	.000
I attend a class at the university	IM	-.19	.040	-.17	.079	-.37	.000	-.18	.058	-.23	.016
	EM	.26	.006	.30	.001	.28	.002	.28	.002	.35	.000
	RAI	-.291	.002	-.30	.001	-.43	.000	-.30	.001	-.37	.000
I discuss work with my research advisor	IM	-.14	.149	-.07	.452	-.17	.076	-.07	.444	-.11	.263
	EM	.25	.007	.39	.000	.30	.001	.31	.001	.39	.000
	RAI	-.27	.004	-.31	.001	-.33	.000	-.26	.005	-.34	.000
I discuss work with my colleagues / classmates	IM	.02	.851	.11	.239	.03	.785	-.04	.651	.06	.530
	EM	.29	.002	.40	.000	.31	.001	.26	.006	.39	.000
	RAI	-.22	.018	-.24	.011	-.23	.014	-.24	.009	-.27	.004

Legend: r - correlation coefficient, p - significance level.

Results indicate that internal motivation for doctoral students' scholarly activities in most cases (25 of 30 possible) was inversely related to meaningfulness of life and its various aspects. In half these cases the association was statistically significant ($p < .05$). For the activities, "writing a scholarly text (thesis, article, etc.)" and "searching for and synthesizing information about a research topic," almost all

correlations between meaningfulness of life indicators and internal motivation were direct and significant (with one exception, LC). For the activities, “organizing and collecting data for research” and “discussing work with scientific director/research advisor,” correlations were positive, but did not reach significance, but for the activity, “discussing work with colleagues / classmates” the correlations were close to zero.

External motivation for all types of doctoral students’ scholarly activity was directly and significantly associated with meaningfulness of life indicators, without exception. A similar picture emerged for the associations between meaningfulness of life parameters and the relative autonomy of student motivation (RAI, representing the discrepancy between internal and external reasons for acting); these associations were significant and negative.

6.2. The correlations of meaningfulness personality orientations with social-contextual supports for the satisfaction of doctoral students’ basic psychological needs

The findings show (Table 02) that meaningfulness of life is directly and significantly associated with the degree of basic psychological need satisfaction in almost all cases. Exceptions included, first, links between satisfaction of the need for autonomy in close relationships (with mother, and friend) with the parameters of personal goals and fullness of life process, and second, the links between relatedness need satisfaction with a friend and the parameter of goals, in the context of communication with mother and the parameter process , and in the context of communication with colleagues and the result parameter. All of these associations were direct, but did not reach significance.

Table 02. [The correlations of meaningful orientations of personality with social-contextual supports for the satisfaction of doctoral students’ basic psychological needs (according to Pearson's formula)]

Scales		LPO Questionnaire's scales									
		Goals		Process		Result		LC		ML	
		r	p	r	p	r	p	r	p	r	p
Autonomy	with friend	0.18	.057	0.12	.206	0.36	.000	0.40	.000	0.30	.001
	with mother	0.11	.260	0.15	.107	0.28	.003	0.27	.005	0.25	.008
	in close relationships	0.17	.076	0.17	.071	0.38	.000	0.39	.000	0.33	.000
	with colleagues / classmates	0.34	.000	0.31	.001	0.25	.008	0.37	.000	0.38	.000
	with academic advisor	0.27	.004	0.29	.002	0.28	.003	0.19	.045	0.33	.000
	in class	0.26	.006	0.18	.060	0.23	.015	0.30	.001	0.30	.001
	in university-related settings	0.35	.000	0.31	.001	0.30	.001	0.34	.000	0.41	.000
	total	0.33	.000	0.31	.001	0.39	.000	0.42	.000	0.44	.000
Competence	with friend	0.31	.001	0.33	.000	0.31	.001	0.35	.000	0.41	.000
	with mother	0.27	.004	0.23	.013	0.27	.005	0.30	.001	0.34	.000
	in close relationships	0.34	.000	0.33	.000	0.33	.000	0.38	.000	0.43	.000
	with colleagues / classmates	0.47	.000	0.44	.000	0.34	.000	0.42	.000	0.51	.000
	with academic advisor	0.39	.000	0.41	.000	0.37	.000	0.38	.000	0.49	.000
	in class	0.42	.000	0.36	.000	0.35	.000	0.35	.000	0.46	.000
	in university-related settings	0.47	.000	0.45	.000	0.40	.000	0.43	.000	0.55	.000
	total	0.48	.000	0.46	.000	0.42	.000	0.46	.000	0.57	.000
Relatedness	with friend	0.18	.058	0.27	.004	0.43	.000	0.36	.000	0.37	.000
	with mother	0.26	.006	0.15	.118	0.22	.020	0.20	.037	0.25	.007
	in close relationships	0.27	.004	0.26	.006	0.40	.000	0.34	.000	0.38	.000
	with colleagues / classmates	0.26	.005	0.22	.023	0.11	.234	0.09	.331	0.20	.035
	with academic advisor	0.29	.002	0.34	.000	0.28	.003	0.23	.013	0.34	.000
	in class	0.20	.039	0.25	.007	0.20	.030	0.18	.053	0.27	.004
	in university-related	0.30	.001	0.32	.000	0.24	.010	0.21	.030	0.33	.000

	settings										
	total	0.34	.000	0.35	.000	0.35	.000	0.30	.001	0.41	.000
needs satisfaction total		0.44	.000	0.43	.000	0.45	.000	0.45	.000	0.55	.000

Legend: r - correlation coefficient, p - significance level.

6.3. The comparison of internal and external motivation and their discrepancy (relative autonomy) in various forms of university-related activity in contrast groups

Results of comparison are shown in Table 03. As can be seen, in the group of doctoral students with a low level of meaningfulness of life, internal motivation was significantly higher in such types of scholarly activity as “writing a scholarly text (thesis, article, etc.),” “searching for and synthesizing information about a research topic,” and “attending a class at the university.” In the three remaining instances the differences between groups did not reach significance. Further, external motivation was higher in all types of activity in the group with a high level of meaningfulness in life. Relative autonomy for activities (computed as the discrepancy between internal and external motivation) was significant in the contrast groups: internal motivation for scholarly activity is greatest in the group with a low level of meaningfulness in life.

Table 03. [Indicators of internal (IM) and external motivation (EM) and their discrepancy (RAI) in various forms of university-related activity, and their comparison by Student’s t-test, by meaningfulness of life (ML)]

Parameter	Group	Low ML n=27		High ML n=29		t – fact	Significance of the difference
		\bar{a}	σ	\bar{a}	σ		
I write a scholarly text (thesis, article, etc.)	IM	10.26	2.14	8.76	2.17	2.61	.012
	EM	6.19	1.88	8.17	1.75	-4.09	.000
	RAI	4.07	2.97	0.59	2.51	4.72	.000
I organize and collect data for research	IM	9.52	1.65	8.69	2.22	1.58	.121
	EM	6.78	1.89	8.24	1.66	-3.07	.003
	RAI	2.74	3.03	0.45	2.73	2.97	.004
I search for and synthesize information about a research topic	IM	10.11	1.99	8.14	2.31	3.41	.001
	EM	6.81	2.09	8.59	1.82	-3.37	.001
	RAI	3.30	2.95	-0.45	3.03	4.68	.000
I attend a class at the university	IM	9.85	1.73	8.62	2.37	2.24	.031
	EM	6.52	1.91	8.34	1.63	-3.84	.000
	RAI	3.33	2.56	0.28	2.64	4.39	.000
I discuss work with my research advisor	IM	9.78	1.55	9.07	3.12	1.06	.292
	EM	6.85	2.16	8.93	1.65	-4.07	.000
	RAI	2.93	2.88	0.14	3.04	3.51	.001
I discuss work with my colleagues / classmates	IM	7.22	2.12	7.48	2.31	-0.44	.662
	EM	6.56	2.26	8.48	1.77	-3.54	.001
	RAI	0.67	3.09	-1.00	2.24	2.30	.024

Legend: \bar{a} – average, σ – dispersion. In italics are indicated nonsignificant results.

6.4. The comparison of basic psychological need satisfaction among doctoral students in contrast groups

Results in Table 04 show that satisfaction of all basic psychological needs in each relationship context with one exception (relatedness with colleagues/classmates) was substantially greater in the group with a high level of meaningfulness of life.

Table 04. [Basic psychological need satisfaction among doctoral students in contrast groups:
 Comparison by Student's t-test of various contexts]

Parameter		Group	Low ML n=27		High ML n=29		t – fact	Significance of the difference
			\bar{a}	σ	\bar{a}	σ		
Autonomy	with friend		5.96	0.85	6.63	0.40	-3.71	.000
	with mother		5.38	1.15	6.23	1.06	-2.86	.006
	in close relationships		5.67	0.86	6.43	0.58	-3.84	.000
	with colleagues / classmates		4.56	0.99	5.58	1.13	-3.61	.001
	with academic advisor/supervisor		4.33	0.95	5.23	1.18	-3.14	.003
	in class		4.65	1.06	5.47	1.17	-2.73	.008
	in university-related settings		4.51	0.78	5.43	0.94	-3.98	.000
	Total		4.98	0.70	5.83	0.64	-4.74	.000
Competence	with friend		5.47	0.79	6.28	0.68	-4.10	.000
	with mother		5.91	0.83	6.59	0.66	-3.33	.001
	in close relationships		5.69	0.68	6.43	0.56	-4.42	.000
	with colleagues / classmates		4.57	1.00	6.06	0.89	-5.93	.000
	with academic advisor/supervisor		4.06	1.29	5.66	1.10	-4.96	.000
	in class		4.85	0.97	5.94	1.04	-4.05	.000
	in university-related settings		4.49	0.90	5.89	0.88	-5.83	.000
	total		4.97	0.71	6.10	0.63	-6.30	.000
Relatedness	with friend		5.11	1.01	6.25	0.81	-4.66	.000
	with mother		5.73	1.07	6.46	1.05	-2.57	.013
	in close relationships		5.42	0.73	6.36	0.72	-4.86	.000
	with colleagues / classmates		3.57	1.17	4.16	1.42	<i>-1.71</i>	.095
	with academic advisor/supervisor		3.31	1.13	4.48	1.54	-3.27	.002
	in class		2.99	1.03	3.78	1.46	-2.36	.023
	in university-related settings		3.29	0.95	4.14	1.22	-2.90	.005
	total		4.14	0.72	5.03	0.87	-4.13	.000
needs satisfaction total			4.70	0.55	5.65	0.60	-6.21	.000

Legend: \bar{a} – average, σ – dispersion. In italics are indicated nonsignificant results.

6.5. Discussion

Comparing all of the results, it is possible to affirm that the level of meaningfulness of life and the predominance of either external or internal motivation in various forms of doctoral students' university-related activity are closely interconnected. Unexpected was the inverse relation of internal motivation with meaningfulness of life and the higher level of internal motivation among those with a lower level of meaningfulness of life. It turns out that if doctoral students have their own goals in life, if their self-realization is satisfied and their life is emotionally full and satisfying, then the main forms of university-related activity for them are only externally motivated, at least in the present sample. In other words, life goals and their realization lie outside of scholarly activity. These results can be interpreted in line with the general social context of scholarly activity in contemporary Russia, raising the question of the status and prospects of a scholarly career. Despite numerous efforts on the part of the government, this type of activity thus far remains not among the most promising. It is possible to comprehend the results in a purely psychological context, considering a scholarly occupation in the university as a means of overcoming a low meaningfulness in life. This is consistent with the result of research that shows that work functions as a means of returning meaning to life (Heine, Proulx & Vohs, 2006).

Entirely expected were the close links between basic psychological need satisfaction and level of meaningfulness of life. This finding fully agrees with the predictions of SDT, as well with empirical results (e.g., Martela, Ryan & Steger, 2017).

Among the possible questions for future research, first and foremost, is the question of the cultural relativity of the results obtained herein. As has previously been shown, value-meaning regulation has its cultural specificity, closely linked with the social context (*Culture and psychology*, 2001; Salikhova, 2013 etc.), and for that reason it is important to continue this research both in other regions of Russia and for doctoral students of different departments and specializations, and even more interesting would be the results in other countries. Another direction for the development of the present research would be to relate it with the scholarly effectiveness of doctoral students, that is, to clarify the impact that external and internal motivation have for the effectiveness of academic and scholarly achievement of doctoral students in the future.

7. Conclusion

Generalizing all obtained results, it is possible to assert:

- The association of internal and external motivation in various forms of university-related activity of doctoral students is linked with the level of meaningfulness of life the higher the meaningfulness of life, the greater the external motivation (of doctoral students for their scholarly endeavors).
- The link between internal motivation and meaningfulness in life is more characteristic of specific forms of university-related activity: “writing a scholarly text (thesis, article, etc.)” and “searching for and synthesizing information about a research topic.” Motivation for forms of university-related activity, which are connected with communication and with subject-related activities (“organizing and collecting data for research” and “discussing work with scientific director/research advisor”), is less connected with the level of meaningfulness in life.
- Basic psychological need satisfaction among doctoral students is directly linked with the level of meaningfulness of life: the greater the level of satisfaction, the higher the level for all the components of meaningfulness of life.

Results of the present study can assist in identifying the problem areas in the organization of higher education in Russia and in pointing out directions for its increased effectiveness.

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