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**CORRELATION BETWEEN BIOGRAPHICAL REFLECTION AND
TOLERANCE OF AMBIGUITY**

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Abstract

Tolerance of ambiguity is most needed in unpredictable and difficult life situations, where one has to make decisions and life choices. However, the basis of the reflexive mechanism underlying this phenomenon is still undiscovered. Biographical reflection is a type of reflection one demonstrates when introspecting on one's life events, where life choices have to be made. The study hypothesis is the assumption that biographical reflection is a predictor variable for tolerance of ambiguity. The sample consists of the data obtained from 250 people aged 18 to 45. The criteria measured were biographical reflection (Biographical Reflection Questionnaire or BRQ, by M.V. Klementyeva) and tolerance of ambiguity (The Multiple Stimulus Types Ambiguity Tolerance Scale, MSTAT, by D.L. MacLain, adjusted to the Russian context). The data obtained was analyzed using Pearson's correlation coefficient, Mann-Whitney U-test, and linear regression. The discovered correlation between biographical reflection and tolerance of ambiguity proves that people with stronger biographical reflection show better tolerance of ambiguity ($p \leq 0.01$). Biographical reflection and tolerance of ambiguity decrease with aging: the respondents aged 35 and over reported a lower degree of biographical reflection ($p = 0.001$) and tolerance of ambiguity ($p = 0.001$). We have discovered that a higher degree of biographical reflection implied a higher MSTAT score ($p = 0.001$). Besides, the impact of biographical reflection on the variability of ambiguity tolerance becomes stronger with aging, mainly in the female sample. Stronger biographical reflection reduces the life choice ambiguity effect when people experience doubts and alienation.

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1. Introduction

The transitivity and challenges of the digital society in the 21st century create a greater number of unknown and unpredictable situations in people's lives, thus affecting their psychological well-being. The present-day life specifics, such as a shift away from the traditional life cycle, free and flexible choice of life development patterns, the desire to take control of one's way of living and "biographical experimenting", as well as the wide-scale personal expansion in the digital space and the inconsistency of communications, do accentuate an individual's authenticity and personality, of course. But, on the other hand, all of these factors make a person more vulnerable in the face of life changes, destroy a person's connection with social and cultural support assets and aggravate the ambiguity of life. An adult person takes responsibility for the effectiveness of his or her own life, but at the same time is often not ready to accept the negative consequences of his or her choices and mistakes, demonstrating "to perceive ambiguous situations as a source of threat" (Budner, 1962, p. 29). Due to a profound ambiguity of the future, it turns out to be impossible to exercise the absolute self-control of one's life journey: the consequences of life choices can be positive or negative, desirable or disappointing and lead to self-fulfilment or cause regret. According to the latest studies (Hitsuwari & Nomura, 2021; Pérez-Fuentes et al., 2020), a positive attitude towards ambiguity (tolerance of ambiguity), as expressed in the desire for life changes, the willingness to deal with life challenges and go beyond the limits, is indicative of the successful personal development, as well as self-efficacy in both behaviour and activities. In this regard, the issue of adults' inner personal developmental assets contributing to the individual's self-fulfilment and self-efficacy in unpredictable and difficult situations of making life choices and stronger hardiness to developmental risks, is becoming increasingly relevant, making psychological studies of the phenomena that determine self-development and self-determination processes extremely important in terms of both psychological science and practice.

In present-day psychology, developmental assets are often understood as conditions for the positive development of an individual: "Developmental assets have been conceptualized as key relationships, opportunities, values, skills, and self-perceptions that help young people limit their engagement in high-risk behaviours, enjoy hardiness in the face of adversity, and thrive" (Benson & Scales, 2009, p. 87).

One of such inner assets dealt with by present-day psychology is biographical reflection.

Biographical reflection is a type of reflection focused on the life path of an individual. It is manifested in those life situations when the possibility of one's personal development (the "zone of proximal development") is translated into action, and life changes are perceived as an opportunity to rethink the autobiographical self. Biographical reflection helps people rethink their own self and reframe their relationships with the world and other people, as well as gain a sense of control over the quality of life and become the author of their own destiny. The mechanisms of biographical reflection are the logical skills applied to analyze the reasons for being, autobiographical knowledge, biographies of other people and the life narrative. The sum of these mechanisms determines two congruent forms of biographical reflection, one of which is the reflexive analysis of the cultural concept of biography (life scenario) being an intrapsychic structure, where the individual's life path is shared with the others (while the others mean people and their ideas embodied in art, science, religion and other spheres of life, for example, literary characters, God, etc.), correlated with the main predicted stages of development ("reflection of the life of

others”), and the second one is the reflexive analysis of the unique phases and events of the individual’s life (“reflection of one’s own life”). Both forms of biographical reflection are interconnected and develop a psychosocial unity between the individual’s life path and a system of social and cultural opportunities and limitations of life development, making one’s autobiographical self attractive and understandable to other people. According to the study findings, “a shift from one form of biographical reflection to the other is a necessary condition for the reflection to be efficient: distraction from the rumination of the current experience and impartial introspection of what is happening, going beyond the limits of a life problem mentally, as required to exercise the cognitive processing of that problem in a controllable and deliberate way. Here one form of biographical reflection is not effective enough; a person who possesses the asset function of reflection can choose an alternative form by switching over. Since the mechanisms of the alternating forms of biographical reflection are manifested in different systems (“self - self” and “self - other”), a person can change the reflexive position and objects of reflection arbitrarily so as to ensure the optimum regulation and comprehension of life changes” (Klementyeva, 2020, p. 60).

Thanks to biographical reflection, connections are established between life events and the life journey appears to become a new integrity (Klementyeva, 2020). According to Sapogova, (2019) and Köber et al. (2019), the reflexive function of the autobiographical self-ensures the individual’s self-efficacy in following his or her life path and achieving good results on the way. Relying on the identification patterns as set in the cultural concept of biography, one overcomes alienation and loneliness, as well as maintains the continuity and cohesion of one’s life with the lives of other people. Being well aware of the uniqueness of his or her life path, an individual asserts the authenticity and identity of the autobiographical self.

Biographical reflection is most required in ambiguous life situations, when an adult is ready to resolve the contradiction between what is desired and what there really is, to make a life choice, to rethink the reasons to live and revise the life development path (Klementyeva, 2020; Köber et al., 2019). Adults can juxtapose their aspirations against the actual opportunities or limitations for their implementation, as well as analyze the available personal and cultural assets critically. However, for the adults making a life choice, it’s more about changing themselves and the world, amplifying the social and cultural reality, “digesting” new biographical cases, practices, concepts, meanings and scenarios in order to turn them into cultural phenomena, rather than adapting to the life changes.

2. Problem Statement

Most of important life events (death of a spouse, divorce, a move to a new place of residence, graduation, imprisonment, injury or illness, marriage, unemployment, retirement, etc.) are treated in psychology as stressful, extreme situations, where the scale of a person’s life changes and the change of the life path as a whole is used as a stress tolerance assessment system (Hutchison, 2018; Pérez-Fuentes et al., 2020). It is obvious that life events affect the subsequent development of a person indirectly, and primarily through the psychological mechanisms of reflection (Grossmann et al., 2020; Starovoytenko, 2019). Previous studies have shown that a person’s hardiness as the ability to overcome stressful, extreme situations, while maintaining stability and demonstrating successful behaviour and activities, has to do with tolerance of ambiguity (Leontiev et al., 2016), where biographical reflection acts as an inner asset that supports hardiness (Klementyeva, 2020), making it possible for the person to maintain selfhood and the

sense of the continuity of self (Köber et al., 2019). The correlation between biographical reflection and hardiness is based on the mechanisms underlying the development of the life purpose, solving life problems and setting goals. Biographical reflection in tense life situations is associated with the necessity to make a life choice in conditions of ambiguity, where the individual's life in a variety of its meanings is addressed in the self-consciousness of the autobiographical self. As an integral part of personal development, biographical reflection in adults serves as an inner asset, translating development processes from the external determination to self-determination mode (Ryan & Deci, 2017), thereby contributing to the personal self-efficacy in unpredictable and difficult situations of making a life choice and improving hardiness to developmental risks. Although tolerance of ambiguity has been studied in terms of cognitive processing of information and decision-making (Fernández-Campos et al., 2021; Furnham & Marks, 2013; Pérez-Fuentes et al., 2020; van Zyl, 2020), the reflexive mechanism underlying tolerance of ambiguity remains unknown.

These points lead to the following assumptions:

a. A well-developed biographical reflection can increase tolerance of ambiguity.

b. The impact of biographical reflection on tolerance of ambiguity can change subject to age and gender.

Therefore, at the next stage of psychological research of the inner asset function of the biographical reflection mechanism, the relationship between biographical reflection and tolerance of ambiguity must be considered.

The hypothesis of this empirical study was based on the assumption that biographical reflection is the predictor variable for tolerance of ambiguity in an individual.

3. Research Questions

In our study, we were committed to find out, in which way the two forms of biographical reflection (reflection of one's own life and reflection of the life of others) affect the tolerance of ambiguity. We conducted an empirical study focusing on the following questions:

- to what extent can tolerance of ambiguity be attributed to biographical reflection;
- to what extent do the age and gender of the respondents affect the contribution of biographical reflection to the variability of ambiguity tolerance indicators.

4. Purpose of the Study

The study is intended to establish the correlation between biographical reflection and tolerance of ambiguity.

5. Research Methods

Sampling. The study involved 250 individuals, including: aged 18 to 25 (Me = 21.7) — 92; aged 26 to 35 (Me = 29.3) — 78; aged 36 to 45 (Me = 40.7) — 80; male — 107 (43%), women — 143 (57%).

Methods. The methods used included: Biographical Reflection Checklist / BRC (Klementyeva, 2016) and General Ambiguity Tolerance Scale, MSTAT, adjusted to the specifics of the Russian-speaking sample group (Leontiev et al., 2016).

Static data analysis methods. The statistical software package SPSS v.21 with the AMOS module was used. The correlation between the indicators was identified using comparative analysis (Mann-Whitney U-test), correlation analysis (Pearson's correlation coefficient / r), linear regression (ordinary least squares / OLS method). The quality of the regression model was estimated based on the statistics obtained from the Fisher test (F). The coefficient of determination (R^2) was used to assess the influence of the predictor variables; the proportion of the total variance described by the regression model is sufficient for a value of $R^2 \geq 0.50$, which shows the close correlation between the dependent variable and the predictor variables.

6. Findings

The analysis of how biographical reflection and tolerance of ambiguity correlate with age showed a slight decrease in the overall biographical reflection ($r = -0.15$ with $p = 0.001$), general tolerance of ambiguity ($r = -0.10$ with $p = 0.03$) and attitude to ambiguous situations ($r = -0.11$ with $p = 0.01$) with aging. The effect of chronological age on indicators does exist, but it is negligible.

The significant correlations presented in Table 1 indicate that adults with strong biographical reflection show better tolerance of ambiguity.

Table 1. Correlation between Biographical Reflection and Tolerance of Ambiguity (n = 250)

Indicators		Biographical Reflection		
		Overall biographical reflection	Reflection on one's own life	Reflection on other people's lives
Ambiguity tolerance indicators	Attitude to novelty	+0.09	+0.12	-0.05
	Attitude to challenges	+0.23*	+0.25*	+0.22*
	Attitude to ambiguous situations	-0.18*	-0.14	-0.36*
	Ambiguity preferred	+0.18*	+0.19*	+0.16*
	Ambiguity accepted/avoided	+0.08	+0.06	-0.09
	Tolerance of ambiguity (total score)	+0.21*	+0.22*	-0.15

Legend: * — significance of the indicator at $p \leq 0.01$

The statistical data in Table 2 obtained by the linear regression method show the sufficiency of the correct predictions as compared with the actual observable indicators, so the models applied have proven to be adequate for the empirical data analysis.

Table 2. Regression Model Indicators (n = 250)

Dependent variable	Predictor variables	Indicators		
		β	t	Quality of the model
Biographical reflection	Attitude to novelty	+0.09	+0.41	F = 4.39 (p = 0.003); R ² = 0.41
	Attitude to challenges	+0.04	+0.08	
	Attitude to ambiguous situations	-0.36	-1.01	
	Ambiguity preferred	+0.34	+0.74	
Tolerance of ambiguity	Reflection on one's own life	+0.23	+4.11**	F = 8.89 (p < 0.001); R ² = 0.50
	Reflection on other people's lives	-0.12	-2.06*	

Legend: * — significance of the indicator at p < 0.05; ** — significance of the indicator at p < 0.01

It was found that biographical reflection indicators contribute significantly to the ambiguity tolerance profile. Tolerance of ambiguity contributes also to the variability of biographical reflection, but only to a small extent. The most significant contribution to the ambiguity tolerance potential of an individual is made by awareness and reflection of one's life authorship, which increases the individual's hardiness to life challenges and helps overcome difficulties when achieving the set goals.

Indicators were discovered to vary significantly by the gender: biographical reflection of the lives of other people is better developed in female rather than in male; the indicators of attitude towards challenges, preference for ambiguity and tolerance of ambiguity (total score) are higher in male than in women. The data of the comparative analysis (conducted using the U-test) are presented in Table 3.

Table 3. Arithmetic Mean Values and Comparative Analysis Results in Groups of Respondents

Scales	Indicators		
	M (σ)		p-value in U-test
	male (n = 107)	female (n = 143)	
Attitude to novelty	12.9 (3.1)	11.6 (3.5)	0.090
Attitude to challenges	37.9 (7.7)	32.4 (7.4)	0.005
Attitude to ambiguous situations	36.9 (10.0)	35.7 (9.5)	0.335
Ambiguity preferred	45.9 (9.8)	40.2 (9.4)	0.001
Ambiguity accepted/avoided	42.7 (10.1)	40.9 (12.0)	0.010
Tolerance of ambiguity (total score)	88.8 (16.1)	84.1 (15.2)	0.013
Biographical reflection	5.4 (1.9)	5.7 (1.9)	0.001
Reflection on one's own life	5.4 (2.0)	5.7 (2.0)	0.005
Reflection on other people's lives	5.4 (1.9)	5.7 (1.9)	0.037

The regression analysis data presented in Table 4 prove conclusively that biographical reflection as an inner asset is most in demand in the female sample group.

Table 4. Regression Model Indicators

Dependent variable	Predictor variables	Indicators		
		β	t	Quality of the model
18 to 25 years old (n = 92)				
Tolerance of ambiguity	Reflection on one's own life	+0.13	+1.56	F = 1.69 (p = 0.19); R ² = 0.31
	Reflection on other people's lives	-0.12	-1.29	
26 to 35 years old (n = 78)				
Tolerance of ambiguity	Reflection on one's own life	+0.40	+3.07**	F = 4.81 (p = 0.01); R ² = 0.48
	Reflection on other people's lives	-0.15	-1.16	
36 to 45 years old (n = 80)				
Tolerance of ambiguity	Reflection on one's own life	+0.25	+1.68	F = 1.37 (p = 0.26); R ² = 0.35
	Reflection on other people's lives	-0.06	-0.39	

Dependent variable	Predictor variables	Indicators		
		β	t	Quality of the model
	female (n = 143)			
Tolerance of ambiguity	Reflection on one's own life	+0.26	+3.65**	F = 6.95 (p = 0.001); R ² = 0.52
	Reflection on other people's lives	-0.03	-0.45	
	male (n = 107)			
Tolerance of ambiguity	Reflection on one's own life	+0.19	+2.05*	F = 4.45 (p = 0.01); R ² = 0.41
	Reflection on other people's lives	-0.23	-2.53*	
Legend: * — significance of the indicator at p < 0.05; ** — significance of the indicator at p < 0.01				

7. Conclusion

The study deliverables are consistent with the way that the present-day developmental psychology interprets the role of reflexive mechanisms in adults' self-determination and self-development, the cognitive determinants of a person's attitude to ambiguous situations and decision-making strategies used by a person in such situations.

The study findings substantiate our assumption that biographical reflection in adults appears to be a psychological tool applied to make important decisions in difficult and ambiguous life situations, as well as a source of adaptation to rapidly changing reality. The development of biographical reflection affects the individual's potential for self-determination and self-development. Biographical reflection can make a greater contribution to the tolerance of ambiguity if used intentionally as an inner asset to develop a positive attitude towards new and unpredictable life situations and to come up with behaviour strategies appropriate in such situations. Strong biographical reflection makes it possible for adults to assess properly their ability to control their life as well as to see the limits and scope of this control. In general, adults with stronger reflection are more likely to accept new experience and life changes than adults with poor biographical reflection. Using biographical reflection as an inner asset to develop tolerance of ambiguity, adults assert their authorship of life, experience a sense of freedom, and assume responsibility for their life choices.

We believe that biographical reflection is the most important inner asset of an adult person, regulating tolerance of ambiguity predominantly in new and unpredictable life situations, guiding important choices and decisions, thereby relieving anxiety, improving self-confidence and helping to find new reasons to live.

The leading role of reflective mechanisms in self-determination of an adult's activity and behavior is highlighted by contemporary psychologists (Leontiev et al., 2016; Ryan & Deci, 2017). Together with authors (Grossmann et al., 2020; Köber et al., 2019; Sapogova, 2019), we believe that highly developed biographical reflection makes it possible for an adult to not only shape a clear idea of important life events, but also assert the authenticity of their autobiographical self. We'd like to point out the fact that stimulation of biographical reflection can generally produce a positive effect in the difficult life situations that either require overcoming obstacles or limitations or result from the lack of experience in making hard decisions. The results of our research are consistent with the data of the authors (Kettlewell et al., 2019), who emphasize that the reflection of unhappy life events stimulates the mechanisms of self-regulation and self-determination, prompting a person to search for new, more effective ways of responding to difficult

situations. Biographical reflection as an asset ensures critical assessment of life choices, as well as flexibility in choosing and planning activity and behaviour strategies in new and difficult life situations.

The impact of biographical reflection on the tolerance of ambiguity demonstrated by women is consistent with the research evidence that shows conclusively that female are more likely to reflect on their lives than male (Berntsen et al., 2019).

Generally, the data we have obtained shows that using biographical reflection as an inner asset in adulthood is a natural human development mechanism related to the buildup of the life path reflection, when lower dependence on cultural assets and stronger recourse to inner, reflective assets become a prerequisite for self-development self-determination of an individual, helps find new reasons to live and overcome the ontological anxiety that goes along with the decision-making process in difficult and ambiguous life situations. The minor impact of age on the indicators of biographical reflection and tolerance of ambiguity proves that age is an integrative factor, convenient if you need to describe and predict the probable paths of the individual's development over time and demonstrating the cumulative impact of various determinants on the quality of the adult's life.

Thus, well-developed biographical reflection in an individual is a condition for his or her positive attitude to new and unpredictable life situations. The adults who are able to use biographical reflection as an inner asset show more confidence when having to make decisions, better tolerance of ambiguous information and readiness to take risk. Strong biographical reflection gives a person a sense of freedom and promotes responsibility in the cases of making difficult life choices.

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