Психологическая наука и образование
2025. *30*(6), 117–135.
https://doi.org/10.17759/pse.2025300607
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Psychological Science and Education
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https://doi.org/10.17759/pse.2025300607
ISSN: 1814-2052
ISSN: 2311-7273 (online)

Научная статья | Original paper

The role of subjective assessment of life in the manifestation of intellectual and academic abilities in adolescents

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Abstract

Context and relevance. Subjective assessment of life — a sense of freedom, responsibility, fulfillment and direction — is considered not only as an indicator of personal maturity, but also as a resource for cognitive activity. The theoretical basis of the study is existential analysis (V. Frankl, A. L ngle). This work expands the understanding of the relationship between existential maturity and psychometric characteristics, academic success and neuropsychological markers, including interhemispheric organization of psychomotor functions. **Objective.** To identify the features of the relationship between the parameters of subjective assessment of life and the manifestation of intellectual, psychomotor, linguistic and academic abilities in adolescents aged 13–14. **Hypothesis.** It is assumed that a teenager's subjective assessment of life, associated with existential maturity, can be a predictor of high intellectual and academic results. In adolescence, these characteristics acquire special significance as indicators of personal maturity and general mental development, which is manifested in the individual configuration of academic and intellectual achievements, features of emotional self-regulation, as well as in the profile of interhemispheric asymmetry. **Methods and materials.** The study involved 39 7th-grade students (M = 13,08, SD = 0,48, 56% boys). The results were assessed according to the A. Längle existential scales, linguistic and logical tasks, psychomotor characteristics and average scores in academic subjects. **Results**. Existential characteristics of adolescents are associated with results of intelligence tests, academic performance and emotional regulation. The most pronounced connections were shown by Self-distancing and Responsibility; Freedom is associated with emotional management, Fulfilment — with inclusion in the cognitive and emotional sphere. Psychomotor analysis revealed their predominant connections with the activity of the left hand, reflecting the contribution of right-hemisphere mechanisms. **Conclusions**. Existential maturity of adolescents is an internal resource that supports cognitive, academic and emotional development. The connection of existential characteristics with right-hemisphere activity allows us to consider the subjective assessment of life as a marker of not only personal but also neuropsychological maturity, which opens up prospects for further research and the creation of practical programs to support adolescents.

Keywords: subjective assessment of life, existential scales, adolescence, intellectual abilities, academic performance, psychomotor functions, emotional intelligence

For citation: Zhambeeva, Z.Z., Kabardov, M.K. (2025). The role of subjective assessment of life in the manifestation of intellectual and academic abilities in adolescents. *Psychological Science and Education, 30*(6)*,* 117–135. (In Russ.). https://doi.org/10.17759/pse.2025300607

Роль субъективной оценки жизни в проявлении интеллектуальных и академических способностей у подростков

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Резюме

Контекст и актуальность. Субъективная оценка жизни — ощущение свободы, ответственности, наполненности и направленности — рассматривается не только как индикатор личностной зрелости, но и как ресурс когнитивной активности. Теоретическую основу исследования составляет экзистенциальный анализ (В. Франкл, А. Лэнгле). Настоящая работа расширяет понимание взаимосвязей экзистенциальной зрелости с психометрическими характеристиками, учебной успешностью и нейропсихологическими маркерами, включая межполушарную организацию психомоторики. **Цель.** Выявить особенности взаимосвязи между параметрами субъективной оценки жизни и проявлением интеллектуальных, психомоторных, лингвистических и академических способностей у подростков 13–14 лет. **Гипотеза.** Предполагается, что субъективная оценка жизни подростка, сопряженная с экзистенциальной зрелостью, может быть предиктором высоких интеллектуальных и академических результатов. В подростковом возрасте данные характеристики приобретают особое значение как индикаторы личностной зрелости и общего психического развития, что проявляется в индивидуальной конфигурации учебных, интеллектуальных достижений, особенностях эмоциональной саморегуляции, а также в профиле межполушарной асимметрии. **Методы и материалы**. В исследовании принимали участие 39 учащихся 7-х классов (M = 13,08, SD = 0,48, 56% мальчики). Оценивались результаты по шкалам экзистенции А. Лэнгле, лингвистическим и логическим задачам, психомоторным характеристикам и средним баллам по учебным предметам. **Результаты**. Экзистенциальные характеристики подростков связаны с результатами интеллектуальных тестов, академической успеваемостью и эмоциональной регуляцией. Наиболее выраженные связи показали Самодистанцирование и Ответственность; Свобода сопряжена с управлением эмоциями, Исполненность — с включенностью в познавательную и эмоциональную

сферу. Психомоторный анализ выявил их преимущественные связи с активностью левой руки, отражающей вклад правополушарных механизмов. **Выводы**. Экзистенциальная зрелость подростков является внутренним ресурсом, поддерживающим когнитивное, академическое и эмоциональное развитие. Связь экзистенциальных характеристик с правополушарной активностью позволяет рассматривать субъективную оценку жизни как маркер не только личностной, но и нейропсихологической зрелости, что открывает перспективы для дальнейших исследований и создания практических программ поддержки подростков.

Ключевые слова: субъективная оценка жизни, шкалы экзистенции, подростковый возраст, интеллектуальные способности, академическая успеваемость, психомоторные функции, эмоциональный интеллект

Для цитирования: Жамбеева, З.З., Кабардов, М.К. (2025). Роль субъективной оценки жизни в проявлении интеллектуальных и академических способностей у подростков. *Психологическая наука и образование, 30*(6)*,* 117–135. https://doi.org/10.17759/pse.2025300607

Introduction

Subjective attitudes toward one's own life reflect the level of personal maturity and the meaningfulness of existence. Within the framework of existential-analytic theory (V. Frankl; A. Längle), this attitude is described as the capacity for conscious choice, responsibility, and internal coherence, which together determine the developmental trajectory of the individual. Contemporary psychological research increasingly shifts the focus from external indicators of success to the internal foundations of maturity, autonomy, and intellectual productivity. In early adolescence (ages 13–14), these foundations acquire particular significance, as this developmental period is marked by the formation of basic mechanisms of meaning regulation that influence cognitive, academic, and emotional functioning.

Existential maturity is an integrative characteristic that reflects the development of such personal capacities as self-distancing, self-transcendence, freedom, and responsibility, as well as the derived parameters of Personality (P) and Existence (E). These indicators, operationalized in A. L ngle and K. Orgler's Existential Scale (Existenzskala), are viewed as key components of inner regulation that shape the direction and quality of learning and cognitive engagement.

In Längle's model, existential fulfillment (G) represents the integrated outcome of the four existential levels and is expressed in the combined score (P + E). Fulfillment emerges when a person is able to formulate meaningful answers to the four fundamental existential motivations: "Can I be?" (1st FEM), "Do I like living?" (2nd FEM), "Do I have the right to be myself?" (3rd FEM), and "What is the meaning and direction of my life?" (4th FEM). Fulfillment reflects the depth and meaningfulness of existence and is considered an important indicator of subjective life evaluation (Krivtsova, Längle, Orgler, 2009).

According to the interpretation proposed by S.V. Krivtsova (drawing on A. Längle and V. Frankl), adolescence represents the onset of the third "major wave" in ontogenesis, associated with the third fundamental motivation — the question "Do I have the right to be myself?", which reflects adolescents' striving for self-respect and authenticity. At ages 13–14, the development of self-structures, protection of personal boundaries, and identity formation become central tasks. At the same

time, adolescents begin to address questions regarding the future, goals, and meaning (the fourth fundamental motivation). This existential tension — an inner conflict between values and the conditions for their realization — accounts for behavioral ambivalence, emotional instability, and situational regressions. Adolescents strive for autonomy, sometimes overestimate their abilities, and often display polar traits — confidence and vulnerability simultaneously — manifested in heightened emotionality in interactions with peers and others (Krivtsova, 2015, 2016; Längle, 2022). Thus, subjective life evaluation in this period remains in a state of formation and is strongly influenced by emotional reactions, which is important to consider when assessing it.

These theoretical considerations are supported by empirical findings indicating that existential maturity functions as an integrated resource for personal and cognitive development. One study found that contemporary adolescents tend to demonstrate average levels of freedom (F), which limits their perception of available options when making decisions; self-distancing and self-transcendence are characterized by limited internal coherence and are associated with increased anxiety and depressive tendencies. At the same time, a more balanced profile of freedom (F) and responsibility (V) has been observed, which researchers interpret as reflecting adolescents' limited involvement in situations requiring serious decision-making and commitments (Medvedeva, 2024).

Further studies demonstrate links between existential characteristics and the emotional domain: existential fulfillment is associated with lower anxiety, greater positive affect, and higher emotional intelligence (Chernyavskaya, Ivanova, 2017). Other work reports that higher G is related to intrinsic cognitive motivation rather than orientation toward external approval (Chernyavskaya, 2024). In adolescents, the Personality (P) scale is considered a factor supporting the prevention of deviant behavior and fostering harmonious personality development (Grigorieva, 2020). Several studies have established that fulfillment (G) is associated with the unfolding of abilities, learning motivation, and academic success (Malakhova, Samoylichenko, 2017; Aminov, Malakhova, Chernyavskaya, 2021). Among seventh graders, self-distancing and self-transcendence correlate positively with students' agentic position, whereas low levels of freedom (F) and responsibility (V) correspond to its negative manifestations (Gavrilyuk, Markina, 2020).

International research emphasizes conceptually similar constructs such as personal maturity and internal self-coherence. Although terminology varies, these approaches share a common focus on subjective foundations of life activity. Studies have shown that clarity of self-understanding is associated with higher levels of meaning in life (Yang et al., 2025); adolescents' academic achievement is positively related to meaning in life, with self-perception strengthening this association (Liu et al., 2025); and eudaimonic aspects of well-being — goal orientation, autonomy, and competence — serve as predictors of school performance (Clarke et al., 2023). A large-scale study (grades 4–6: n = 19443; grades 7–9: n = 15472; grades 10–12: n = 6267) also demonstrated that higher levels of life meaning are associated with more stable indicators of psychological well-being (Cai et al., 2025).

In the present study, the assessment of intellectual and academic abilities is supplemented by an objective neuropsychological approach. In particular, tapping-test motor activity reflects not only psychomotor efficiency but also interhemispheric asymmetry, which is linked to cognitive and personality characteristics (Simernitskaya, 1978; Bragina, Dobrokhotova, 1988; Khomskaya et al., 1997;

Kabardov, 2013; Zhambeeva, 2022). The tapping test reveals the handedness profile as an indicator of functional hemispheric dominance. According to Khomskaya (1997), measures of manual asymmetry demonstrate the largest number of correlations with mental functions and emotional regulation. Recent research also indicates that motor asymmetry may shift under the influence of educational environmental factors: for example, high levels of computer use among younger schoolchildren may lead to the restructuring of lateral profiles and the development of new motor patterns, interpreted as an adaptive response to the digitalization of learning (Pankova et al., 2021).

Such parameters as self-distancing and responsibility reflect the level of voluntary regulation and resistance to external influences, which, according to neuropsychological studies, relate to patterns of interhemispheric interaction and the balance of regulatory functions of the right and left hemispheres (Khomskaya, 1997). Thus, handedness reflects not only motor characteristics but also cognitive strategies, emotional sensitivity, and regulation. This provides grounds to hypothesize associations between Existential Scale indicators and tapping-test characteristics, including the predominance of right- or left-hemispheric patterns.

The reviewed literature demonstrates consistent links between existential characteristics, personal resilience, emotional regulation, and learning motivation. However, studies exploring adolescents' subjective life evaluation using the Existential Scales remain limited (Grigorieva, 2020; Malakhova, Samoylichenko, 2017; Aminov, Malakhova, Chernyavskaya, 2021; Gavrilyuk, Markina, 2020). Most prior work has focused on adults and university samples. The novelty of the present study lies not only in examining adolescents aged 13–14 — a period of emerging autonomy and identity formation — but also in analyzing, for the first time, the complex associations between subjective life evaluation and cognitive, emotional, psychomotor, and academic indicators.

Grounded in the existential approach (V. Frankl; A. Längle), which conceptualizes subjective life evaluation as an integrative factor that shapes cognitive, personality, and regulatory processes in adolescence, our study aimed to identify the associations between subjective life evaluation, as measured by Längle's Existential Scales, and the manifestation of intellectual, psychomotor, linguistic, and academic abilities in adolescents aged 13–14. We hypothesized that adolescents' subjective life evaluation, reflecting their level of existential maturity, would be positively associated with intellectual productivity, academic achievement, and emotional self-regulation. In early adolescence, these characteristics serve as important indicators of personal maturity and psychological development, manifesting in cognitive and academic outcomes, emotional intelligence, and profiles of interhemispheric asymmetry.

Materials and methods

The study was conducted in two stages. Stage 1 involved data collection using a set of psychodiagnostic methods, including A. Längle's Existential Scales, cognitive tasks (verbal and nonverbal), an emotional intelligence test, the tapping test, and the calculation of academic performance. The sample consisted of 39 students aged 13–14 years enrolled in the seventh grade at a school in the Moscow region (M = 13,08 years, SD = 0,48; 56% boys). The age range of 13–14 years corresponds to the onset of personal identity formation, which makes this sample particularly relevant for studying subjective life evaluation. The study was administered in a group format and conducted with written parental consent. Cases with incomplete ques-

tionnaire responses or significant difficulties in understanding instructions were excluded. Stage 2 consisted of statistical data processing using Spearman's correlation and the Mann–Whitney U test in Statistica 10.

Instruments. 1. Linguistic tasks (Kabardov, 2013), assessing linguistic competence and verbal–cognitive characteristics: Proverbs, Antonyms, Synonyms, derivational tasks (e.g., suffix -ящий, rhymes for the word чайка), interlinguistic competence (Swahili), and the Vocabulary subtest of the Wechsler scale. 2. Academic performance — the average annual school grade. 3. Raven's Progressive Matrices — assessment of nonverbal intelligence. 4. Tapping test — four trials with each hand (10 seconds per trial) to assess motor tempo. Handedness coefficient: C_R = ((RH — LH) / (RH + LH)) × 100% (Kabardov, 2013). 5. N. Hall's Emotional Intelligence Questionnaire (30 items, 5 scales). 6. Existential Scales by A. Längle and K. Orgler (Krivtsova, Längle et al., 2009), adapted for adolescents (Pergamenshchik, Puzyrevich, 2011). The scales assess: Self-distancing (SD; Selbst-Distanzierung), Self-transcendence (ST; Selbst-Transzendenz), Freedom (F; Freiheit), Responsibility (V; Verantwortung) and three integrative indicators: Personality (P = SD + ST), Existentiality (E = F + V), Fulfillment (G = P + E). 7. Complex Analogies — 20 word pairs, time limit of 5 minutes. 8. Wechsler Coding — assessment of processing speed and visuomotor coordination.

Results

The analysis revealed multidimensional associations between existential parameters and cognitive, emotional, psychomotor, and academic indicators.

Table 1

Correlation matrix of A. Längle's existential scales and psychodiagnostic indicators (N = 39)

	Existenzskala by A. Längle						
	Self-distancing	**Self-transcendence**	**Freedom**	**Responsibility**	**Personality**	**Existentiality**	**Fulfillment**
Emotional intelligence (N. Hall)							
Managing emotions						0,337	0,322
Raven's Progressive Matrices							
Series ***B***	0,358						
Series ***C***		0,372		0,386	0,370	0,324	0,379
Number of errors				–0,322			
Linguistic tasks							
D. Wechsler's Vocabulary subtest				0,354			
Antonyms	0,345			0,353			
Rhyme «seagull»			0,341	0,346		0,345	0,329
Wechsler coding	0,322						
Complex analogies				0,321			

	Existenzskala by A. Längle						
	Self-distancing	**Self-transcendence**	**Freedom**	**Responsibility**	**Personality**	**Existentiality**	**Fulfillment**
School subjects							
Algebra	0,400			0,485		0,387	0,374
Biology				0,358			
Geography	0,344			0,335			
History	0,489			0,448		0,392	0,382
Social studies	0,395			0,433		0,379	0,349
Russian	0,433			0,484		0,423	0,375
Physics	0,354						
Tapping-test							
trial 3 PR				0,333			
trial 4 PR	0,341	0,386	0,397	0,344	0,441	0,394	0,466
Mean of 4 PR trials				0,408		0,366	0,359
Sum of 4 PR trials				0,408		0,366	0,359
trial 1 LR	0,383			0,328			
trial 2 LR	0,546		0,473	0,634	0,474	0,602	0,583
trial 3 LR	0,467		0,322	0,331	0,405	0,340	0,417
rial 4 LR	0,442		0,424	0,465	0,378	0,465	0,478
Mean of 4 LR trials	0,492		0,371	0,480	0,378	0,451	0,465
Difference MAX-MIN values of the LR	0,344						
Sum of 4 LR trials	0,492		0,371	0,480	0,378	0,451	0,465
Difference of the sums of the PR and LR	–0,335						
ight-handedness coefficient	–0,397						

Note: Spearman rank correlations are significant at $p < 0,05$; PR — right hand, LR — left hand.

Table 1 presents the correlation analysis of the relationships between intellectual measures and the existential scales. Raven's Series ***B*** correlated primarily with SD, which also aligns with its association with Wechsler Coding parameters, reflecting analytical reasoning patterns. Series ***C*** scores demonstrated a broader spectrum of associations across several scales (ST, V, P, E, G), indicating cognitive flexibility, while V showed a stable relationship with complex analogies. Linguistic tasks ("Antonyms", "Rhyme for seagull", and the Vocabulary subtest) were primarily associated with V and SD, underscoring their role in semantic differentiation and linguistic productivity. In contrast, F and E emphasize the importance of internal openness and meaningful engagement, contributing to creativity.

Academic performance (in algebra, history, social studies, and Russian language) was positively associated with SD and V,

highlighting the role of internal organization and volitional regulation in learning activity. Emotional self-regulation was linked to meaningfulness and life satisfaction, particularly in the domain of emotion regulation (E and G).

According to the tapping-test results, the greatest number of correlations was found for left-hand activity (SD, F, V, P, E, and G), indicating the involvement of right-hemisphere mechanisms in the development of existential characteristics. The fourth RH trial showed strong associations with all scales, reflecting their role in sustaining performance under fatigue. Negative correlations of SD with the right-handedness coefficient and with the difference between RH and LH sums further confirm its link to right-hemisphere dominance, while the correlation with the LH MAX–MIN difference indicates an association between SD and nervous system inertia.

To examine the robustness of the findings, a group analysis (Mann–Whitney U test) was conducted; the differences for SD and ST are presented in Table 2.

Students with higher SD levels demonstrated better performance on Raven's test,

Table 2

Group analysis of differences in Self-Distancing (SD) and Self-Transcendence (ST) in psychodiagnostic indicators and academic performance

	Group 1 Self-distancing (SD) Lower level N = 16	**Group 2 Self-distancing (SD) Higher level N = 15**	**U test**	**p-value**	**Effect size (r)**
Raven's Progressive Matrices					
Total score	204,5	**291,5**	68,5	0,044	0,4
Linguistic tasks					
Antonyms	201,0	**295,0**	65,0	0,031	0,4
Rhyme «seagull»	203,5	**292,5**	67,5	0,040	0,4
School subjects					
Algebra	187,0	**309,0**	51,0	0,007	0,5
Geography	200,5	**295,5**	64,5	0,030	0,4
History	190,0	**306,0**	54,0	0,010	0,5
Social studies	205,5	**290,5**	69,5	0,048	0,4
Russian	185,5	**310,5**	49,5	0,006	0,5
Physics	201,0	**295,0**	65,0	0,031	0,4
Tapping-test, PR **— right hand,** LR **— left hand**					
trial 1 LR	196,5	**299,5**	60,5	0,020	0,4
trial 2 LR	175,5	**320,5**	39,5	0,002	0,6
trial 3 LR	197,0	**299,0**	61,0	0,021	0,4
trial 4 LR	187,5	**308,5**	51,5	0,007	0,5
Mean of 4 LR trials	184,0	**312,0**	48,0	0,005	0,5

	Group 1 Self-distancing (SD) Lower level N = 16	**Group 2 Self-distancing (SD) Higher level N = 15**	**U test**	**p-value**	**Effect size (r)**
Sum of 4 LR trials	184,0	**312,0**	48,0	0,005	0,5
Difference of the sums of the PR and LR	**309,5**	186,5	66,5	0,036	0,4
Right-handedness coefficient	**319,0**	177,0	57,0	0,013	0,4
	Group 1 Self-transcendence ST Below level N = 15	**Group 2 Self-transcendence ST Higher level N = 13**	**U test**	**p-value**	**Effect size (r)**
Raven's Progressive Matrices					
Series ***C***	166,500	**239,500**	46,500	0,020	0,4

Note: тables 2–5, Effect size (r): 0,1–0,29 — small effect; 0,3–0,49 — medium; ≥ 0,5 — large.

on the "Antonyms" and "Rhyme for seagull" tasks, as well as higher achievement in key humanities and STEM-related school subjects. This indicates that SD is associated with intellectual flexibility, linguistic intuition, verbal-logical thinking, and academic success. In addition, this group showed higher left-hand tapping scores (across all trials and aggregated measures), which may reflect right-hemisphere lateralization (Bragina, Dobrokhotova, 1988; Khomskaya, Efimova et al., 1997), linked to the development of the ability to distance oneself from immediate action.

For ST, significant differences were found only in Raven's Series ***C***, which reflects dynamic visual reasoning (Yasyukova, 2005). The absence of differences on other indicators is likely related to the emotional-personal immaturity of seventh graders and supports the understanding of ST as a later stage of existential development.

Table 3 presents the differences between groups based on V and F scores. Adolescents with higher V values demonstrated better intellectual performance: on Raven's Series ***C***, complex analogies, antonyms, and the "Rhyme for seagull" task, as well as higher achievement across several subjects (algebra, biology, history, social studies, and Russian). They also showed greater motor activity with both hands, which may indicate stability and well-developed self-regulation skills.

Meanwhile, students with higher F scores demonstrated better emotion regulation and greater left-hand activity (in nearly all trials), as well as higher RH activity in the 4th trial, suggesting predominant involvement of the right hemisphere with minimal contribution from the left.

Table 3

Group analysis of differences in Responsibility (V) and Freedom (F) in psychodiagnostic indicators and school subjects

	Responsibility (V) Group 1 Lower level N = 16	**Responsibility (V) Group 2 Higher level N = 14**	**U test**	**p-value**	**Effect size (r)**
Raven's Progressive Matrices					
Series ***C***	186,0	**279,0**	50,0	0,011	0,5
Number of errors	**297,0**	168,0	63,0	0,044	0,4
Complex analogies	193,0	**272,0**	57,0	0,023	0,4
Linguistic tasks					
Antonyms	200,0	**265,0**	64,0	0,048	0,4
Rhyme «seagull»	199,0	**266,0**	63,0	0,044	0,4
School subjects					
Algebra	187,5	**277,5**	51,5	0,013	0,5
Biology	199,0	**266,0**	63,0	0,044	0,4
History	195,5	**269,5**	59,5	0,031	0,4
Social studies	196,5	**268,5**	60,5	0,034	0,4
Russian	183,5	**281,5**	47,5	0,008	0,5
Tapping-test, PR **— right hand,** LR **— left hand**					
trial 3 PR	196,5	**268,5**	60,5	0,034	0,4
trial 4 PR	199,0	**266,0**	63,0	0,044	0,4
Mean of 4 PR trials	184,0	**281,0**	48,0	0,008	0,5
Sum of 4 PR trials	184,0	**281,0**	48,0	0,008	0,5
trial 2 LR	159,0	**306,0**	23,0	0,0002	0,7
trial 3 LR	197,0	**268,0**	61,0	0,036	0,4
ntrial 4 LR	185,5	**279,5**	49,5	0,010	0,5
Mean of 4 LR trials	184,0	**281,0**	48,0	0,008	0,5
Sum of 4 LR trials	184,0	**281,0**	48,0	0,008	0,5
	Group 1 Freedom (F) Below level N = 14	**Group 2 Freedom (F) Higher level N = 18**	**U test**	**p-value**	**Effect size (r)**
Emotional intelligence (N. Hall)					
Managing emotions	178,5	**349,5**	73,5	0,048	0,3

	Group 1 Freedom (F) Below level N = 14	**Group 2 Freedom (F) Higher level N = 18**	**U test**	**p-value**	**Effect size (r)**
Tapping-test					
trial 4 PR	165,5	**362,5**	60,5	0,014	0,4
trial 2 LR	162,0	**366,0**	57,0	0,009	0,5
trial 3 LR	172,0	**356,0**	67,0	0,026	0,4
trial 4 LR	156,5	**371,5**	51,5	0,005	0,5
Mean of 4 LR trials	166,0	**362,0**	61,0	0,014	0,4
Sum of 4 LR trials	166,0	**362,0**	61,0	0,014	0,4

Table 4

Group analysis of differences in Personality (P) and Existentiality (E) in psychodiagnostic indicators and school subjects

	Group 1 Personality (P) Lower level N = 15	**Group 2 Personality (P) Higher level N = 16**	**U test**	**p-value**	**Effect size (r)**
Raven's Progressive Matrices					
Series ***C***	188,0	**308,0**	68,0	0,042	0,4
Tapping-test, PR **— right hand,** LR **— left hand**					
trial 4 PR	170,5	**325,5**	50,5	0,006	0,5
trial 2 LR	169,0	**327,0**	49,0	0,005	0,5
trial 3 LR	172,0	**324,0**	52,0	0,008	0,5
trial 4 LR	181,0	**315,0**	61,0	0,021	0,4
Mean of 4 LR trials	183,0	**313,0**	63,0	0,026	0,4
Sum of 4 LR trials	183,0	**313,0**	63,0	0,026	0,4
Right-handedness coefficient	**294,0**	202,0	66,0	0,034	0,4
	Group 1 Existentiality (E) Lower level N = 17	**Group 2 Existentiality (E) Higher level N = 17**	**U test**	**p-value**	**Effect size (r)**
School subjects					

	Group 1 Existentiality (E) Lower level N = 17	**Group 2 Existentiality (E) Higher level N = 17**	**U test**	**p-value**	**Effect size (r)**
Algebra	227,5	**367,5**	74,5	0,017	0,4
Biology	238,0	**357,0**	85,0	0,042	0,3
History	233,0	**362,0**	80,0	0,027	0,4
Tapping-test					
trial 4 PR	230,0	**365,0**	77,0	0,021	0,4
trial 2 LR	204,0	**391,0**	51,0	0,001	0,5
trial 3 LR	231,5	**363,5**	78,5	0,024	0,4
trial 4 LR	227,5	**367,5**	74,5	0,017	0,4
Mean of 4 LR trials	219,0	**376,0**	66,0	0,007	0,5
Sum of 4 LR trials	219,0	**376,0**	66,0	0,007	0,5

Table 4 summarizes the differences between groups based on P and E scores. Adolescents with higher P scores demonstrated better performance on Raven's Series ***C***, greater left-hand activity (in trials 2–4 and in both mean and total scores), lower right-handedness coefficients, and higher performance in the 4th RH trial.

Students with higher E scores showed better academic achievement across several subjects (algebra, biology, history) and greater tapping-test activity: higher RH performance in the 4th trial as well as higher LH activity in trials 2–4, including mean and total measures.

Differences between groups based on G are presented in Table 5. Higher fulfillment

Table 5

Group analysis of differences in Fulfillment (G) in psychodiagnostic indicators and school subjects

	Performance (G) Group 1 Below level N = 16	**Performance (G) Group 2 Higher level N = 17**	**U test**	**p-value**	**Effect size (r)**
Raven's Progressive Matrices					
Series ***C***	212,0	**349,0**	76,0	0,032	0,4
Linguistic tasks					
Rhyme «seagull»	214,0	**347,0**	78,0	0,038	0,4
School subjects					
Russian	216,5	**344,5**	80,5	0,048	0,4
Tapping-test, PR **— right hand,** LR **— left hand**					

	Performance (G) Group 1 Below level N = 16	**Performance (G) Group 2 Higher level N = 17**	**U test**	**p-value**	**Effect size (r)**
trial 4 PR	185,0	**376,0**	49,0	0,002	0,5
Mean of 4 PR trials	213,0	**348,0**	77,0	0,035	0,4
Sum of 4 PR trials	213,0	**348,0**	77,0	0,035	0,4
trial 1 LR	213,5	**347,5**	77,5	0,037	0,4
trial 2 LR	182,0	**379,0**	46,0	0,001	0,6
trial 3 LR	192,0	**369,0**	56,0	0,004	0,5
trial 4 LR	195,5	**365,5**	59,5	0,006	0,5
Mean of 4 LR trials	189,0	**372,0**	53,0	0,003	0,5
Sum of 4 LR trials	189,0	**372,0**	53,0	0,003	0,5

was associated with better performance on Raven's Series ***C***, higher scores on the "Rhyme for seagull" task, better achievement in Russian language, and higher tapping-test performance: for RH (4th trial, and mean and total scores across 4 trials) and for all LH trials (mean and total scores).

Discussion

The findings confirmed our hypothesis that adolescents' subjective evaluation of life, reflecting their level of existential maturity, is associated with higher cognitive, academic, and emotional-regulatory outcomes. These results allow us to view existential maturity as a factor integrating cognitive, personality, and neuropsychological aspects of development. The effect size estimates (r) for the identified differences showed that most effects were medium or large, which supports the substantive robustness of the results despite the limited sample size.

Existential characteristics — particularly SD and V — were associated with success in intellectual tests, linguistic tasks, and several academic subjects requiring abstract reasoning and work with complex material, confirming their role in organization and goal-directedness in learning activity. The additional associations observed for ST, P, E, and G reflect their contributions to cognitive flexibility and the ability to integrate diverse elements of information. The absence of pronounced effects on ST is consistent with Frankl's conceptualization (Längle, 2022) of ST as a later-developing capacity that emerges after SD: during adolescence, this process is still taking shape, as the foundational ability to distance oneself from immediate bodily, emotional, and situational influences may not yet be fully established. Earlier publications have noted that higher ST, V, P, E, and G scores in adolescents are linked to academic achievement, self-esteem, the ability to process significant experiences, and persistence — patterns that align with our findings for V and G (Aminov, Zhambeeva, 2015; Aminov et al., 2015). Overall, adolescents' existential maturity emerges as a factor supporting intellectual development, academic success, and the capacity for complex cognitive activity.

The study further revealed that the ability for emotional self-regulation is closely related to existential characteristics reflecting subjective life satisfaction and meaningfulness. This is consistent with previous findings showing that higher Fulfillment in adolescents is associated with increased emotional intelligence and reduced anxiety (Chernyavskaya, Ivanova, 2017).

Group analyses complement the correlational results: students with higher F scores demonstrated better emotion regulation, indicating the role of inner autonomy and decision-making capacity in the development of emotional intelligence. This corresponds to A. L ngle's concept, in which freedom is understood as a process enacted anew in each concrete situation and grounded in inner dialogue, perception of possibilities, and alignment of choices with values and conscience. In adolescence, emotional involvement acts as the key "motor" of this process, initiating the formation of will and supporting readiness for action. The observed associations of F with emotion regulation and right-hemisphere characteristics reflect the importance of emotional engagement and holistic perception in the development of freedom. Its final stage — resolve and action — requires integrating emotional impulses with cognitive choice, which corresponds to the association found between F and creative lexical use (L ngle, 2018).

Our results support the role of motor activity as an indicator of lateral specialization (Simernitskaya, 1978; Bragina, Dobrokhotova, 1988; Khomskaya et al., 1997; Kabardov, 2020). Existential characteristics (SD, F, V, P, E, and G) were more strongly associated with left-hand activity, suggesting possible right-hemisphere involvement in their formation. Meanwhile, the 4th right-hand tapping trial correlated with all scales, likely reflecting their role in increasing tempo under fatigue (Rusalova, 2003; Kabardov, 2013). Group analyses confirmed that high levels of SD, F, and P are accompanied by pronounced "left-handedness" and signs of right-hemisphere lateralization.

The stage-like nature of the development of interhemispheric asymmetry helps explain these findings. In early childhood, the right hemisphere dominates; however, around age 10 the role of the left hemisphere increases, which is attributed to educational environments that systematically stimulate activities requiring formal-logical analysis (Farber, 1986). The right-hemisphere predominance observed in some seventh graders (SD, F, and P) suggests the preservation of holistic processing strategies during a developmental period when the shift toward left-hemisphere functional asymmetry is not yet complete (Rotenberg, Bondarenko, 1989; Kabardov, Artsishevskaya, 2012).

In the analysis of V and G (Mann–Whitney results), group differences were observed across right- and left-hand tapping indicators. The stability of FAM characteristics and self-regulation may indicate more integrated and synchronized interhemispheric regulation. Such motor organization implies cognitive maturity and the ability for volitional regulation that integrates both logical and intuitive processing styles (Kosheleva, Zhambeeva et al., 2023). Thus, existential responsibility in this context emerges not only as a personal disposition but also as a neuropsychological foundation of cognitive stability.

At the same time, it should be noted that the relationships between existential characteristics and interhemispheric asymmetry must be interpreted at this stage as preliminary and indicative of potential developmental tendencies. These findings require further investigation using additional neuropsychological and instrumental methods for assessing lateralization.

Conclusions

The present study demonstrated that adolescents' subjective evaluation of life is associated with their intellectual, academic, and emotional-regulatory characteristics, as well as with features of interhemispheric asymmetry. The SD and V scales played a key role in predicting cognitive and academic outcomes, reflecting their contribution to the development of goal-directedness and volitional regulation. G and F were also associated with cognitive activity, emotional self-regulation, and right-hemisphere characteristics, indicating the integration of cognitive and personality processes.

In adolescence, existential characteristics can be viewed as personal regulatory factors and markers of the neuropsychological organization of cognitive processes. Existential maturity thus emerges as an internal resource linked to academic achievement and the stability of emotional–cognitive regulation. Future research should focus on clarifying the dynamics of these associations in older age groups and on developing psychological and educational support programs aimed at fostering existential characteristics as a foundation for academic success and personal growth.

Limitations. The experimental data were collected on a limited sample of adolescents from a single comprehensive school and require caution when comparing results obtained in other samples. Self-report methods may be subject to social desirability and subjective biases, although this risk was partially offset by the inclusion of objective cognitive tests. Furthermore, multiple statistical comparisons with a small sample increase the risk of random effects; the differences and correlations obtained should be considered preliminary and require confirmation in more representative samples.

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Вклад авторов

Жамбеева З.З. — идеи исследования; аннотирование, планирование исследования; контроль за проведением исследования; написание и оформление рукописи.

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Все авторы приняли участие в обсуждении результатов и согласовали окончательный текст рукописи.

Conflict of interest

The authors declare no conflict of interest.

Конфликт интересов

Авторы заявляют об отсутствии конфликта интересов.

Ethics statement

Written informed consent for participation in this study was obtained from the participants (or legal guardians / close relatives).

Декларация об этике

Письменное информированное согласие на участие в этом исследовании было предоставлено респондентами (или законными опекунами / ближайшими родственниками участника).

Поступила в редакцию 07.09.2025 — Received 2025.09.07
Поступила после рецензирования 24.11.2025 — Revised 2025.11.24
Принята к публикации 06.12.2025 — Accepted 2025.12.06
Опубликована 24.12.2025 — Published 2025.12.24