Psychometric properties of the Developmental Tasks Questionnaire for Seniors

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Abstract

The study describes the development of the Developmental Tasks Questionnaire for Seniors (DTQ-S), intended for assessing the level of developmental tasks attainment in old age, and evaluates its psychometric properties. The study group included 851 people, aged 60–94 years ($M = 69.23$; $SD = 6.86$): 540 women (63.5%) and 311 men (36.5%). As a result of the analysis, a 15-item questionnaire comprising three subscales was created: acceptance of one's life, adaptation, and acceptance of passing. Confirmatory Factor Analysis demonstrated that the model had a satisfactory fit. The Cronbach's alpha of the overall scale was .81, demonstrating good internal consistency. Preliminary results suggest that the DTQ-S has adequate convergent and divergent validity. The DTQ-S can be a useful tool for understanding the psychological functioning of seniors for content related to adapting to old age.

Keywords Developmental tasks · Late adulthood · Psychological assessment · Questionnaire · Aging

Introduction

As a natural consequence of the demographic shift associated with increasing life expectancy, there is a growing need for research into the identification of “successful aging” and the adjustment to late adulthood. Similarly, studies are needed to act as a basis for the creation of social policy and prevention programs in the areas of health, social welfare and education for the elderly (Celik et al. 2018; Kim and Park 2017; Pruchno et al. 2017; Röcke and Cherry 2002).

As each stage of life has its own specific characteristics, it seems reasonable to examine the developmental context when analyzing the lifestyles of people at a given stage (Williams 2010). Research indicates that only by considering the nature of development can a complete picture be provided of the life satisfaction, health and psychosocial functioning of people at different stages of adulthood (Ang and Jiaqing 2012).

Two classical, general developmental theories authored by Robert Havighurst and Eric Erikson examine the specific nature of each stage of human development. They posit a trajectory of development that spans infancy to old age and

emphasizes the key elements of functioning in each particular life period.

Havighurst's theory (Havighurst 1963; Havighurst 1981) is one of the first to view human development as a lifelong process composed of many aspects of human activity manifested as developmental tasks. Developmental tasks can be regarded as the challenges confronting people of a certain age, and these act as important determinants of the course of normal development and its effects. Havighurst lists typical developmental tasks faced by people aged over 60 years of age: adapting to a decline in physical strength, adapting to retirement and reduced income, coming to terms with the death of a spouse, maintaining social relations with people in your age, accepting and adapting to changing social roles and establishing good physical living arrangements. Such developmental tasks arise in response to changes in the biological condition of the body related to age, cultural traditions, and individual aspirations.

On the other hand, in his theory of crises and psychosocial development throughout a lifetime, Eric Erikson (1950, 1968, 1982) highlights the need for a space on the continuum of integrity-despair during the period of late adulthood. Experiencing deteriorating health and infirmity, compared to others and to their own past selves, the individual is beset by two strong opposing forces: the desire to achieve a sense of integrity, that is, to achieve a sense of meaning and the sense of a “well-lived life”, and the tendency to fall into despair and

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hopelessness. It is possible to overcome the fear associated with transience and death by adopting a commitment to integrity, accompanied by acceptance. This commitment fosters the feeling that one's own life makes sense, and is derived from a broader perspective of a re-synthesis of lived experience, experiencing the balance of one's own life.

The theoretical assumptions of these two classic authors are not contradictory but complementary, proposing a useful framework for human development. A common feature shared by the two approaches is the periodization of the development occurring throughout human life and understanding the consequences of applying to the challenges of each stage. There is also a mutual connection between the attainment of developmental tasks in a given period of life and experiencing developmental crises. Psychosocial theory, based largely on the ideas of Erikson and Havighurst, accounts for systematic change occurring over the lifespan (Newman and Newman 2012).

In particular, many recent theoretical and empirical studies emphasize the current relevance and practical application of developmental tasks in the later period of life (Schroots 1996; Wadensten 2006; Wold 2013). Newman and Newman (2012) identify developmental tasks as areas of learning for most people in modern society. They associate the stage of later adulthood (60 to 75) with such tasks as accepting one's life, redirecting energy toward new roles, promoting intellectual vigor and developing a point of view about death. A similar approach is taken by Hutteman et al. (2014); however, while they also characterize older adulthood (60 years and older) by the same tasks as Havighurst, they supplement them with new categories involving the adjustment to the decreasing health of a spouse and caring for grandchildren. The tasks were grouped into the domains of romantic relationships, family, job, adult social life, and physical change.

As Röcke and Cherry (2002) note, although the characteristics of developmental tasks are changing in the modern world, many challenges remain key for an individual at an advanced age, such as accepting one's death and that of a spouse. Some of these developmental tasks might be more universal than others and unaffected by cultural changes (McCormick et al. 2011). Many studies indicate that living in accordance with the challenges posed by age seems to be of particular value in late life period (Dezutter et al. 2013; Merriam and Mullins 1981; Westerhof et al. 2017).

Assessment of Developmental Tasks Attainment in Late Adulthood

Bearing in mind the specificity of functioning in late life, the nature of current demographic changes and the increasing number of studies of the various aspects of psychosocial functioning of seniors, there is a growing need for measurement

tools which are specifically designed for this age group. Many authors underline the need to develop various psychometric measures that consider the specificity of the late adulthood period (Lopez et al. 2018, Power et al. 2005; Yesavage et al. 1982; Fuller-Iglesias and Rajbhandari 2016).

However, few existing tools can be used to examine developmental aspects of late adulthood. Although the topic of developmental tasks attainment appears relatively frequently in research, most studies tend to examine those associated with children and adolescents (cf. Borca et al. 2015; Duchesne et al. 2014; Ohlert and Ott 2017; Pinquart and Pfeiffer 2015) or young adults (cf. Salmela-Aro et al. 2012; Schulenberg et al. 2004), with a noticeable lack of research addressing older adults.

Most of the available measures for seniors are based on Erikson's life stages theory, some examples being the Inventory of Psychosocial Balance (Domino and Affonso 1990), the Northwestern Ego-integrity Scale (Janis et al. 2011), life outcome test (Izdebski and Polak 2005) and narrative methods (Torges et al. 2009). Hence, existing studies on late adulthood usually concern the solution of the "integration-despair" crisis (Dezutter et al. 2013; Wiesmann and Hannich 2011). Only one qualitative assessment of developmental task attainment has been drawn up based on the Havighurst model (Freitas et al. 2013).

There is still a need for measurement tools which consider the most important issues of the implementation of tasks appropriate for late adulthood. As psychosocial theories can create approaches for use in clinical practice, the theoretical foundation for the diagnosis and support of older people in their ageing process represents an important consideration (Wadensten 2006). It is therefore desirable to integrate the key elements of the abovementioned concepts into a single empirical, modern application for use as a psychometric measurement tool.

Study Objectives

The study objective was to establish the psychometric properties of a measure of developmental tasks attainment in late adulthood. The evaluation employed explanatory and confirmatory factor analyses, convergent and divergent validity; its relevance was based on associations with demographic characteristics and similar constructs theoretically linked to developmental task attainment and absolute stability and normalization.

Study Design

Procedure

Data were collected between November 2016 and April 2018. Individuals aged over 60 ($N = 851$) were recruited from

senior-focused organizations and clubs including the University of the Third Age, senior centers, nursing homes, physical activity clubs, and religious groups. All participants were recruited directly in person. The study was conducted by members of the research team, these being Master's degree students majoring in Psychology. The research was carried mostly out in groups during classes at the University of the Third Age and Senior Clubs, meetings of older people in schools / kindergartens, in religious (prayer) groups and at sports facilities. Among respondents recruited from nursing homes and sometimes private homes, the studies were conducted individually. The study was anonymous and voluntary.

The research was conducted in the region of central Poland. Purposive sampling was used. The inclusion criteria comprised an age over 60 years and the cognitive ability to complete the tests. In nursing homes, people with dementia were excluded from the study. In this group, a psychologist employed in the institution recruited respondents for the study. In every case, research team member checked the understanding of instruction and examples of items to make sure that the person understands the test. For some respondents who may have had difficulty reading the questionnaire or who were at an advanced age, a research team member provided individual support in completing tests, by giving additional explanations or reading questions. In accordance with Isaksson et al. (2007), individual help was given to any participant who needed it to ensure that the obtained data were valid. In total, 119 respondents needed assistance in completing the questionnaire, especially residents of social welfare home. All questionnaires were completed in hard copy. The overall response rate was 72%.

Sample

To determine the psychometric characteristics of the Developmental Task Questionnaire for Seniors (DTQ-S), 851 people from central Poland, aged from 60 to 94 years ($M = 69.23$, $SD = 6.86$) were recruited. The group included 540 women (63.5%) and 311 men (36.5%) with diverse activities and life situations: participants in non-formal education at the University of the Third Age and Senior Club members ($N = 266$, 31.3%), older people not affiliated in any organizations ($N = 369$, 43.4%) those staying in residential homes ($N = 93$, 10.9%), participants of physical activity groups ($N = 54$, 6.3%) and seniors belonging to religious prayer groups ($N = 69$, 8.1%).

In terms of place of residence, 21.4% of the surveyed were rural residents, 28.4% lived in small towns with up to 50,000 residents, and 50.1% in a larger city of over 50,000 residents. The majority of respondents had a secondary education (40.5%), 29.3% declared vocational education, 14% a basic education, and 15.5% a higher education. In addition, 45.3% of the respondents were married, while 33.2% were widows or

widowers, 12.8% were singles (never married) and 8.7% were divorced.

Seniors from various groups with different lifestyles were examined to represent different types of sociodemographic structure.

Questionnaire Development

The questionnaire was developed based on the general psychometric principles of scales construction (Dyer 2006; Rattray and Jones 2007). Questionnaire design and development must be supported by a logical and structured approach. This process incorporates preplanned methods to establish reliability and validity. The first stage includes purpose - the rationale for the questionnaire identified from the literature. Then identifying research questions and establishing scale and response format takes place. Items are generated from experts, literature review and an underlying theoretical structure. The next stage is pilot work and amendments based on item analysis, explanatory factor analysis and reliability establishing. Then the convergent and divergent validity and confirmation on an independent data set is determined. The process completes the revision of measure.

The Developmental Tasks Questionnaire for Seniors (DTQ-S) was formulated on the basis of the developmental task theory of Havighust (Havighurst 1963; Havighurst 1981) and the psychosocial development theory of Erikson (1950, 1968, 1982). Contemporary approaches to developmental tasks have also been taken into account (Hutteman et al. 2014; Newman and Newman 2012).

A pool of 40 statements was created by an author, and their face and content validity were evaluated by eight competent judges (psychologists with research experience in the field of Developmental Psychology). Each statement was assessed according to theoretical and linguistic accuracy. Repetitive, vague and ambiguous items were removed, as well as those that were not specific for the period of late adulthood. Finally, 28 statements were chosen. These were related to a range of areas: adapting to a decline in physical strength, deteriorating health and the establishment of a satisfactory standard of comfort in life; focusing energy on new roles and adapting to retirement and reduced income; crystallizing views of death and the acceptance of the death of a partner, spouse or friends; accepting one's life and establishing clear membership of this age group. The selected items reflected the general nature of the developmental tasks associated with late adulthood according to the above-mentioned theoretical assumptions. The questionnaire was designed as a self-reporting scale. The items were preceded by a short instruction: "The purpose of this questionnaire is to assess the implementation of various life tasks undertaken in the period of late adulthood. For each statement, please tick the answer that characterizes you the most". The subject performs the assessment on a five-point

scale: 1 - definitely not 2 - rather not, 3 - difficult to assess, 4 - yes, 5 - definitely yes.

Explanatory and Confirmatory Factor Analyses

The first stage of the study was conducted in a group of 336 people aged over 60 years of age (aged 60–88, $M = 68.05$; $SD = 6.14$), and detailed results have previously been published (Zadworna-Cieślak 2017a). The discriminatory power of the questionnaire positions was analyzed to eliminate the statements demonstrating the weakest correlation with the general result. The item-total correlation was assumed to be over .30 (Field 2005). During this stage, 10 questions were removed. Then the data met the requirements necessary to perform the factor analysis, exploratory factor analysis (principal component analysis by Varimax orthogonal rotation) was conducted to establish the structure of the questionnaire. A three-factor structure was adopted for the inventory based on scree analysis and on Kaiser's criterion, with a recommended eigenvalue above 1. Items that were not specific to any factor were removed, as well as those which were strongly correlated with two or more factors. The criteria for item exclusion comprised a loading below .50 and a difference between cross-loadings lower than .20 (Hair et al. 2014; Osborne 2014). The final version of the questionnaire

included 15 statements. Each of the derived factors included five questions (Table 1).

Factor 1, named *Acceptance of one's life*, allows an assessment of an accepting attitude toward one's own life, a positive life outcome, or satisfaction with life in the context of the past and the present, e.g. *I feel fulfilled in my life*.

Factor 2, named *Adaptation*, refers to adaptive behavior, i.e. adapting to changes typical of old age such as a decrease in physical strength, retirement and its related reduced income and maintaining social contact; however, it also includes recognition of the need to enlist the help of others if necessary. np. *I adapt my behavior and decisions to my state of health*.

Factor 3, named *Acceptance of passing* is associated with a reconciliation with the imminence of aging and the inevitability of death, both one's own and that of one's loved ones. e.g. *I have come to terms with the inevitability of death*.

In order to verify the predicted factor structure of the questionnaire, a confirmatory factor analysis was conducted with IBM AMOS software. This analysis was carried out on the next tested group, formed from 515 elderly people aged 60–94: 192 men (37.3%) and 323 women (62.7%). The participants were recruited from the University of the Third Age (18.6%), prayer groups (13.4%), physical activities groups (10.5%), residential homes (18.1%) and those not affiliated to any institutions (39.4%). Most of the respondents were married (45.1%), had secondary education (50.1%), lived in

Table 1 Factor structure of the DTQ-S

Item number and factor name	M	SD	Item-total correlation	Factor load	Explained variance
Factor 1. Acceptance of one's life					28.39
1. I am satisfied with my past life	3.55	1.21	.49	.60	
4. I am satisfied with life in retirement	3.50	1.31	.38	.51	
7. I feel fulfilled in my life	3.54	1.18	.49	.70	
10. In my retirement, I'm trying to pursue my dreams and interests	3.79	1.17	.39	.59	
13. Looking back, I feel I have lead a well-lived life	3.51	1.2	.54	.67	
Eigenvalue = 5.11					
Factor 2. Adaptation					8.88
2. I am adapting my expenses to my income in retirement	3.87	1.18	.45	.67	
5. I maintain social contacts with people my age	4.08	1.16	.44	.62	
8. I am adapting my behaviour and decisions to the state of my health	3.79	1.22	.48	.58	
11. I am adapting to the changes that come with retirement	3.81	1.14	.42	.51	
14. I use the help of others when necessary	3.67	1.12	.40	.55	
Eigenvalue = 1.60					
Factor 3. Acceptance of passing					7.85
3. I have become accustomed to the fact of loved ones passing	3.33	1.35	.36	.56	
6. I have come to terms with the inevitability of death	3.31	1.35	.53	.72	
9. I feel peace when thinking about passing	3.28	1.18	.43	.58	
12. I accept the fact that the end of my life is approaching	3.35	1.33	.44	.62	
15. I see the signs of ageing occurring in me as normal events at my age	3.35	1.33	.46	.62	
Eigenvalue = 1.41					

a larger city of above 50,000 inhabitants (77.5%.) 63.8% of respondents declared that they had chronic diseases.

The analysis was carried out using structural equation modeling according to the maximum likelihood method. The procedure and evaluation criteria for model fit recommended by Hu and Bentler (1998) were adopted. The intended structure incorporated the three intercorrelated theoretical constructs, i.e. *Adaptation*, *Acceptance of passing* and *Acceptance of one's life*. Taking all indices into account, the model turned out to be well fitted, and acceptably reflected the theoretical structure of the analyzed data system: CMIN/DF = 3.36, RMR = 0.06, GFI = 0.94, AGFI = 0.91, NFI = 0.86, RFI = 0.83, IFI = 0.90, TLI = 0.87, CFI = 0.90, RMSEA = 0.07 95%Ci (0.06–0.08).

The analysis revealed that the chosen theoretical construct had a significant influence on the variability of the scores for specific items (Table 2).

Further analysis indicated correlations between certain dimensions (Table 3). The analysis found the three-factor model to be very well fitted to the data, and the test measurements were a strong and accurate expression of latent variables.

Reliability and Validity

The internal consistency of the questionnaire, determined on the basis of Cronbach's alpha and McDonald's omega (composite reliability) coefficients, was good for the general result ($\alpha = .81$; $\omega = .88$), and between acceptable and satisfactory for the following factors: *Acceptance of one's life* – $\alpha = .74$; $\omega = .80$; *Adaptation* – $\alpha = .62$; $\omega = .60$; *Acceptance of passing* – $\alpha = .73$; $\omega = .75$ (Hair et al. 2014; Kline 1999; Peterson and Kim 2013).

Table 2 The results of confirmatory factor analysis

Factor	Item	R ²	β	B	S. E.	CR
Acceptance of ones' life	1	.46	.68	1.00		
	4	.52	.72	1.17	.09	12.72***
	7	.51	.72	1.08	.08	13.94***
	10	.17	.41	.65	.08	8.45***
	13	.60	.77	1.20	.09	13.54***
Adaptation	2	.06	.23	1.00		
	5	.16	.40	1.68	.45	3.75***
	8	.41	.64	2.19	.54	4.1***
	11	.49	.70	2.77	.61	4.55***
	14	.06	.25	1.12	.35	3.16***
Acceptance of passing	3	.25	.50	1.00		
	6	.61	.78	1.64	.16	10.37***
	9	.28	.53	0.95	.11	8.56***
	12	.65	.81	1.55	.15	10.42***
	15	.18	.62	.08		7.45**

*** $p < .001$; ** $p < .01$;

Table 3 Correlations between questionnaire dimensions

		C.R.	P	r
Acceptance of ones' life	<--> Adaptation	3.93	***	.63
Adaptation	<--> Acceptance of passing	3.57	***	.44
Acceptance of ones' life	<--> Acceptance of passing	4.74	***	.29

*** $p < .001$

Absolute stability was determined by the test-retest method with an interval of a month in a group of 35 attendants of the University of the Third Age (included in the total sample). The score was found to be .79 of the overall result, indicating that the tested construct has high stability.

The convergent validity of the tool was determined by correlating the results with those of other questionnaires for similar behaviors and features, as well as with personal resources known to influence the efficient implementation of developmental tasks. In order to determine the divergent validity, its correlation with the risk of depression was calculated. All tools have Polish adaptations and satisfactory psychometric properties. The results are included in Table 4.

As can be seen from the calculated correlation coefficients, the general level of developmental tasks attainment is positively correlated with properties such as general life satisfaction and purpose in life. Positive correlations were also noted in each of the dimensions of the tool, with varying strengths. According to the expectations and theoretical scope of the studied aspects of functioning, the mentioned variables displayed the strongest correlations with *Acceptance of one's life*, while slightly weaker relationships were found with *Acceptance of passing* and the weakest with *Adaptation*.

Correlations were also examined with the results of psychometric tools intended exclusively for the elderly, i.e. those over 60 years of age. Both the overall level of developmental tasks attainment and most of its factors correlated positively with the indicator of a positive life outcome in late adulthood, the index of successful aging and pro-health behavior typical of those of senior age. All correlations associated with the risk of depression in the period of old age were negative: all dimensions of the tool and the overall result. Additionally, it was determined that variables such as resilience (treated as a personality trait) and spirituality show positive relationships with the tool results. The obtained data confirms that the DTQ-S has convergent and divergent validity.

The further analysis investigated whether sociodemographic variables, such as sex, age, place of residence and marital status differentiated the level of implementation of developmental tasks in the studied group. The levels of the variables in different groups of seniors were also compared (Table 5).

Gender did not differentiate the overall level of developmental tasks; however, it was noticed that men present greater *Acceptance of passing* than women. Among the tested groups

Table 4 The validity of the DTQ-S

Variables	1	2	3	4	5	6	7	8
Developmental tasks attainment - overall	.423 *** <i>N</i> = 315	.550 *** <i>N</i> = 132	.554 *** <i>N</i> = 114	.377 ** <i>N</i> = 114	.481 *** <i>N</i> = 315	.411 *** <i>N</i> = 270	.435 *** <i>N</i> = 315	-.550 *** <i>N</i> = 97
Acceptance of ones' life	.508 ***	.697 ***	.784 ***	.544 ***	.469 ***	.509 ***	.307 ***	-.670 ***
Adaptation	.188 **	.341 ***	.22 *	.218 *	.363 ***	.222 ***	.360 ***	-.360 ***
Acceptance of passing	.248 ***	.383 ***	.373 ***	.170 ns	.222 ***	.229 ***	.345 ***	-.247 *

1. Satisfaction with life - Satisfaction with Life Scale (Diener et al. 1985). **2. Purpose in life** - Purpose in Life Test (Crumbaugh and Maholick 1964) **3. Life outcome** - Questionnaire of Life Outcome (Izdebski and Polak 2005) **4. Successful aging** - Successful Aging Index (Knapik 2014), **5. Health behavior** - Health-Related Behavior Questionnaire for Seniors (Zadworna-Cieślak 2017b) **6. Resiliency** - Resiliency Measurement Scale (Ogińska-Bulik and Juczyński 2008) **7. Spirituality** - Self-Description Questionnaire (Heszen-Niejodek and Gruszczyńska 2004). **8. Risk of depression** - Geriatric Depression Scale - Short Form (Yesavage et al. 1982)

*** $p < .001$; ** $p < .01$; * $p < .05$; ns – not significant

Table 5 A Comparison of mean DTQ-S scores across subgroups

Group	Developmental tasks attainment – overall score		Acceptance of ones' life		Adaptation		Acceptance of passing	
	M	SD	M	SD	M	SD	M	SD
Overall (<i>N</i> = 851)	55.95	8.38	18.29	3.74	19.61	3.20	18.05	4.07
Gender:								
Men (<i>N</i> = 311)	56.29	8.05	18.28	3.55	19.36	3.19	18.67	3.82
Women (<i>N</i> = 540)	55.75	8.58	18.3	3.84	19.76	3.2	17.69	4.16
	$t = .91$ ns		$t = -.11$; ns		$t = -1.76$; ns		$t = 3.46$; ***	
Test groups:								
UTA and senior clubs members (<i>N</i> = 266)	55.42	8.64	18.37	3.93	19.43	3.51	17.59	3.92
Seniors not affiliated to organization (<i>N</i> = 369)	55.57	8.43	18.10	3.64	19.64	3.18	17.80	4.16
Seniors from residential homes (<i>N</i> = 93)	57.32	8.77	17.90	4.39	20.29	2.76	19.10	4.06
Physical activities groups members (<i>N</i> = 54)	5.98	6.63	19.64	2.74	19.14	2.84	17.59	3.95
Prayer groups members (<i>N</i> = 69)	8.22	7.48	18.50	2.94	19.62	2.78	20.13	3.40
	$F(4.846) = 2.35$ ns		$F(4.846) = 2.34$ ns		$F(4.846) = 1.56$ ns		$F(4.846) = 7.68$ ***	
Place of residence								
Village (<i>N</i> = 181)	54.73	9.93	17.79	4.38	19.31	3.83	17.66	4.19
Small town (<i>N</i> = 219)	54.71	8.42	18.13	3.65	19.18	3.57	17.34	4.21
Large city (<i>N</i> = 402)	57.09	7.20	18.64	3.29	19.95	2.65	18.53	3.79
	$F(2.799) = 8.35$ ***		$F(2.799) = 3.68$ *		$F(2.799) = 4.96$ **		$F(2.799) = 7.16$ *	

*** $p < .001$; ** $p < .01$; * $p < .05$; ns – not significant

of seniors, statistically significant differences were only noticed for *Acceptance of passing*: this value was found to be the highest in seniors from prayer groups. The overall level of developmental tasks attainment varied according to place of residence. People from the urban environment demonstrate greater implementation of developmental tasks, both overall and individual factors, than people from small towns or villages. Marital status and age did not differentiate the overall level of implementation of developmental tasks.

The analyses indicate that individual sociodemographic variables generally had little impact on the measurement results. As the differences were so slight, it was decided to construct standardized units for whole group results based on the results of the normalization group. The consistency of the results with the normal curve was verified using the Kolmogorov-Smirnov test. As the results significantly differed from a normal distribution (for overall score $KS = .08$, $p < .001$), centile standards were developed for the general score (Table 6). The correct standard measurement error value must be added to or subtracted from the obtained raw result. The confidence interval should be referred to centile standards. A higher score indicated a higher level of developmental task attainment in late adulthood. Assessing the attainment of developmental tasks can help in the planning of promotion and prevention programs for seniors, supporting development in late adulthood and enhancing proper aging adaptation.

Discussion

This study describes the development of the Developmental Tasks Questionnaire for Seniors (DTQ-S) and provides evidence for its reliability and validity. The DTQ-S contains 15 items and allows an assessment of both overall developmental tasks attainment and of three key categories: *Acceptance of one's life*, *Adaptation*, and *Acceptance of passing*. An analysis of the scale's psychometric properties suggests it has satisfactory reliability, validity (convergent and divergent) and absolute stability.

Table 6 Centile standards

Developmental tasks attainment – overall score (S.E = 7.92)	Centile	Result
≤ 39	1–4	Very low
40–46	5–15	Low
47–50	16–24	Below average
50–62	25–75	Average
62–64	76–84	Above average
64–69	85–95	High
70–73	96–99	Very high

The development of the DTQ-S is the first attempt at an empirical adaptation of the key elements of both the Erikson's and Havighurst's theories, and as such, it adds original content to the body of empirical research. However, it should be noted that the factor structure overlaps only partially with the theoretical structure established on the bases of the two classical theories. Some of the tasks originally mentioned by the authors do not appear in the tool. This may be accounted for by the specificity of the functioning of today's senior citizens, whose lifestyle has changed over the course of the past few decades. The changes necessitated by modern civilization are transforming many of the challenges posed by life, and with them, their associated developmental tasks. Developmental paths are also characterized by greater individuality, and the path to the achievement of an integrated personality can be viewed differently depending on the culture and the dominant style of life in the tested country (Buhl and Lanz 2007). Nevertheless, the extracted factors are based around key issues of late adulthood associated with a summing-up of one's life, the formation of attitudes of acceptance, the adoption of behavior associated with adapting to aging-related changes, and the eventual reconciliation with the recognition of the passing of relatives and the prospect of one's own death.

There are some limitations to the study. The average age of current research group was about 70 years old, and the older range of the elderly in society was not properly represented. Hence, further testing is merited with samples that were more accurately targeted and diverse. Although the internal consistency for the general score is satisfactory, the factor *Adaptation* result should be interpreted with caution, due to its lower reliability. In addition, although the three factor model is interpretable and theoretically consistent, *Adaptation* displays the least reliability, which may be due to its relatively high content diversity. It is advisable to continue searching for appropriate measurements of developmental tasks attainment; it is possible that the reliability of the scale might be further improved by adding new items to assess *Adaptation*. The presented psychometric properties of the tool can be considered as preliminary. While the model fit indices derived from the CFA are acceptable, there is nevertheless considerable room for improvement in the specification of the model. This presented factor structure should not be considered final nor as the best measure of this construct. Further research is still required on the assessment of developmental tasks achievement.

Another important limitation is that the DTQ-S allows self-reported and subjective assessment, and the need for social approval could favor a declaration of positive functioning; however, this is a common weakness shared by all quantitative measurement tools. Further studies of DTQ-S predictive validity are also warranted in the future.

Despite its limitations when compared to other complex measures of the psychosocial development of aspects of

functioning in later life (e.g. Freitas et al. 2013; Fuller-Iglesias and Rajbhandari 2016; Janis et al. 2011; Lopez et al. 2018; Power et al. 2005; Torges et al. 2009;), the DTQ-S is a short, simple and unique measure which assesses crucial elements of adjustment to old age. The tool can be used by researchers in empirical studies, as well as by professionals working with elderly clients in various areas of gerontological practice, such as nursing homes, psychological and educational centers, senior clubs and health care institutions. The DTQ-S can serve as a holistic measure of psychosocial development in late adulthood that assesses the most important psychological aspects of functioning in old age, and act as a useful tool for measuring developmental tasks attainment in later life.

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Compliance with Ethical Standards

Conflict of Interests The author states that there is no conflict of interest.

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References

- Ang, R. P., & Jiaqing, O. (2012). Association between caregiving, meaning in life, and life satisfaction beyond 50 in an Asian sample: Age as a moderator. *Social Indicators Research*, 108(3), 525–534.
- Borca, G., Bina, M., Keller, P. S., Gilbert, L. R., & Begotti, T. (2015). Internet use and developmental tasks: Adolescents' point of view. *Computers in Human Behavior*, 5249–5258.
- Buhl, H. M., & Lanz, M. (2007). Emerging adulthood in Europe: Common traits and variability across five European countries. *Journal of Adolescent Research*, 22(5), 439–443.
- Celik, S. S., Celik, Y., Hikmet, N., & Khan, M. M. (2018). Factors affecting life satisfaction of older adults in Turkey. *The International Journal of Aging and Human Development*, 87(4), 392–414.
- Crumbaugh, J. C., & Maholick, L. T. (1964). An experimental study in existentialism: The psychometric approach to Frankl's concept of noogenic neurosis. *Journal of Clinical Psychology*, 20(2), 200–207.
- Dezutter, J., Wiesmann, U., Apers, S., & Luyckx, K. (2013). Sense of coherence, depressive feelings and life satisfaction in older persons: A closer look at the role of integrity and despair. *Aging & Mental Health*, 17(7), 839–843.
- Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49(1), 71–75.
- Domino, G., & Affonso, D. D. (1990). A personality measure of Erikson's life stages: The inventory of psychosocial balance. *Journal of Personality Assessment*, 54(3/4), 576–588.
- Duchesne, S., Ratelle, C. F., & Feng, B. (2014). Developmental trajectories of achievement goal orientations during the middle school transition: The contribution of emotional and behavioral dispositions. *Journal of Early Adolescence*, 34(4), 486–517.
- Dyer, C. (2006). *Research in psychology: A practical guide to methods and statistics*. Malden: Blackwell Publishing.
- Erikson, E. H. (1950). *Childhood and society*. New York: Norton.
- Erikson, E. H. (1968). *Identity. Youth and crisis*. New York: Norton.
- Erikson, E. H. (1982). *The life cycle completed*. New York: Norton.
- Field, A. (2005). *Discovering statistics using SPSS*. London: SAGE Publications.
- Freitas, E. R., Barbosa, A. J. G., Scoralick-Lempke, N., Magalhães, N. C., Vaz, A. F. C., Daret, C. N., et al. (2013). Developmental tasks and life history of the elderly: Analysis of Havighurst's theory. *Psicologia: Reflexão E Crítica*, 26(4), 809–819.
- Fuller-Iglesias, H. R., & Rajbhandari, S. (2016). Development of a multidimensional scale of social integration in later life. *Research on Aging*, 38(1), 3–25.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate data analysis: Pearson new international edition*. Essex: Pearson Education Limited.
- Havighurst, R. (1963). Successful aging. In C. Tobbits & W. Donahue (Eds.), *Process of aging* (pp. 291–320, Williams). New York.
- Havighurst, R. (1981). *Developmental tasks and education*. New York: Longman and Green.
- Heszen-Niejodek, I., & Gruszczyńska, E. (2004). Wymiar duchowy człowieka, jego znaczenie w psychologii zdrowia i jego pomiar [Spirituality as a human dimension, its importance in health psychology, and its measurement]. *Przegląd Psychologiczny*, 47(1), 15–31.
- Hu, L. T., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, 3(4), 424–453.
- Hutteman, R., Hennecke, M., Orth, U., Reitz, A. K., & Specht, J. (2014). Developmental tasks as a framework to study personality development in adulthood and old age. *European Journal of Personality*, 28(3), 267–278.
- Isaksson, U., Santamäki-Fischer, R., Nygren, B., Lundman, B., & Åström, S. (2007). Supporting the very old when completing a questionnaire: Risking bias or gaining valid results? *Research on Aging*, 29(6), 576–589.
- Izdebski, P., & Polak, A. (2005). Bilans życia i poczucie koherencji osób starszych w zależności od ich aktualnej sytuacji życiowej [life outcome and sense of coherence in elderly people in dependence of their present life situation]. *Gerontologia Polska*, 13(3), 188–194.
- Janis, L., Canak, T., Machado, M. A., Green, R. M., & McAdams, D. P. (2011). *Development and validation of the Northwestern Ego integrity scale*. Evanston: Northwestern University.
- Kim, S., & Park, S. (2017). A meta-analysis of the correlates of successful aging in older adults. *Research on Aging*, 39(5), 657–677.
- Kline, P. (1999). *The handbook of psychological testing* (2nd ed.). London: Routledge.
- Knapik, A. (2014). Assessing the quality of aging - presentation of research tool. *Physiotherapy and Health Activity*, 22(1), 42–47.
- Lopez, F. G., Ramos, K., & Kim, M. (2018). Development and initial validation of a measure of attachment security in late adulthood. *Psychological Assessment*, 30(9), 1214–1225.
- McCormick, C. M., Kuo, S. I.-C., & Masten, A. S. (2011). Developmental tasks across the lifespan. In K. F. Fingerman, J. Smith, & T. C. Antonucci (Eds.), *Handbook of lifespan development* (pp. 117–140). New York: Springer.
- Merriam, S., & Mullins, L. (1981). Havighurst's adult developmental tasks: A study of their importance relative to income, age and sex. *Adult Education*, 31(3), 123–141.

- Newman, B. M., & Newman, P. R. (2012). *Development through life: A psychosocial approach*. Belmont: Wadsworth Cengage Learning.
- Ogińska-Bulik, N., & Juczyński, Z. (2008). Skala pomiaru prężności-SPP-25 [Resiliency Measurement Scale -SPP-25]. *Nowiny Psychologiczne*, 3, 39–56.
- Ohlert, J., & Ott, I. (2017). Developmental tasks and well-being in adolescent elite athletes in comparison with recreational/non-athletes. *European Journal of Sport Science*, 17(10), 1343–1349.
- Osborne, J. W. (2014). *Best practices in exploratory factor analysis*. Scotts Valley: CreateSpace Independent Publishing.
- Peterson, R. A., & Kim, Y. (2013). On the relationship between coefficient alpha and composite reliability. *Journal of Applied Psychology*, 98(1), 194–198. <https://doi.org/10.1037/a0030767>.
- Pinquart, M., & Pfeiffer, J. P. (2015). Solving developmental tasks in adolescents with a chronic physical illness or physical/sensory disability: A meta-analysis. *International Journal Of Disability, Development & Education*, 62(3), 249–264.
- Power, M., Quinn, K., Schmidt, S., & WHOQOL-OLD, G. (2005). Development of the WHOQOL-old module. *Quality of Life Research*, 14(10), 2197–2214.
- Pruchno, R., Heid, A. R., & Wilson-Genderson, M. (2017). The great recession, life events, and mental health of older adults. *The International Journal of Aging and Human Development*, 84(3), 294–312.
- Rattray, J., & Jones, M. C. (2007). Essential elements of questionnaire design and development. *Journal of Clinical Nursing*, 16(2), 234–243.
- Röcke, C., & Cherry, K. E. (2002). Death at the end of the 20th century: Individual processes and developmental tasks in old age. *The International Journal of Aging and Human Development*, 54(4), 315–333.
- Salmela-Aro, K., Read, S., Korhonen, T., Vuoksima, E., Rose, R. J., & Kaprio, J. (2012). Young Adults' developmental task-related goals modify the association between self-focused goals and depressive symptoms. *Applied Psychology: Health & Well-Being*, 4(1), 106–125.
- Schroots, J. J. (1996). Theoretical developments in the psychology of aging. *The Gerontologist*, 36(6), 742–748.
- Schulenberg, J. E., Bryant, A. L., & O'Malley, P. M. (2004). Taking hold of some kind of life: How developmental tasks relate to trajectories of well-being during the transition to adulthood. *Development and Psychopathology*, 16(4), 1119–1140.
- Torges, C. M., Stewart, A. J., & Duncan, L. E. (2009). Appreciating life's complexities: Assessing narrative ego integrity in late midlife. *Journal of Research in Personality*, 43(1), 66–74.
- Wadensten, B. (2006). An analysis of psychosocial theories of ageing and their relevance to practical gerontological nursing in Sweden. *Scandinavian Journal of Caring Sciences*, 20(3), 347–354.
- Westerhof, G. J., Bohlmeijer, E. T., & McAdams, D. P. (2017). The relation of Ego integrity and despair to personality traits and mental health. *Journals Of Gerontology Series B: Psychological Sciences & Social Sciences*, 72(3), 400–407.
- Wiesmann, U., & Hannich, H. (2011). A Salutogenic analysis of developmental tasks and Ego integrity vs. Despair. *International Journal Of Aging & Human Development*, 73(4), 351–369.
- Williams, N. (2010). Public health and aging, maximizing function and well-being. *Occupational Medicine*, 60(7), 580.
- Wold, G. H. (2013). *Basic geriatric nursing-E-book*. Elsevier Health Sciences.
- Yesavage, J. A., Brink, T. L., Rose, T. L., Lum, O., Huang, V., Adey, M., & Leirer, V. O. (1982). Development and validation of a geriatric depression screening scale: A preliminary report. *Journal of Psychiatric Research*, 17(1), 37–49.
- Zadworna-Cieślak, M. (2017a). Developmental tasks' attainment in late adulthood – The construction of a new psychometric tool. *Gerontologia Polska*, 25, 156–162.
- Zadworna-Cieślak, M. (2017b). The health-related behavior questionnaire for seniors. *Annals of Psychology*, 20(3), 661–699.

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