





# The Turkish Form of the Delaying Gratification Inventory: Validity and Reliability Studies

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## ARTICLE INFO

### Article History

Received 15.11.2021

Received in revised form  
30.05.2022

Accepted 20.06.2022

Article Type: Research

Article

## ABSTRACT

The aim of this research is to adapt the Delay of Gratification Inventory to a Turkish adult sample. The data for the study was obtained from adults over the age of 18 between April and May 2021. The "Personal Information Form," the "Delay of Gratification Inventory," the "Psychological Well-Being Scale," and the "Barratt Impulsivity Scale Short Form" were used to collect research data. In addition to construct validity and criterion-related validity in the validity assessment of the inventory, in the reliability evaluation, Cronbach's alpha internal consistency, test-retest, and lower-upper 27% group difference values were examined. In exploratory factor analysis, the measurement tool consists of five sub-dimensions, and these sub-dimensions explain 52% of the variance. The conclusion of the CFA show that the five sub-dimension structure obtained has a good fit ( $\chi^2 = 352.97$  N = 265, sd = 184, p = 0.00;  $\chi^2 / df = 1.92$ , RMSEA = .059, CFI = .90, IFI = .90, GFI = .89 and AGFI = .86). In another validity study, it was found that delaying gratification was positively related to psychological well-being and negatively related to impulsivity. Within the framework of reliability, the Cronbach's alpha internal consistency coefficient of the whole inventory was found to be .78. The test-retest coefficient for the whole inventory was found to be .84. Findings at the end of the research indicate that the Turkish form of the measurement tool is at a level that can measure the delaying gratification variable in adults.

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Keywords:

Delay of gratification, validity, reliability

## 1. Introduction

The concept of delaying gratification, which is accepted as an important personality trait in terms of Social Cognitive Theory, is defined as the ability to expect a better prize instead of suddenly enjoying a situation (Mischel & Ebbsen, 1970). The concept was also defined by Hoerger et al. (2011) as the "tendency to forego a strong and immediate reward for the sake of long-term rewards". In other words, it is the ability to delay gratification and involves acquiring a more valuable versus less valuable choice by tolerating a delay or investing more effort (or both) to achieve a more valuable outcome (Beran et al., 2016). An individual's ability to delay gratification is related to other similar skills such as patience, impulse control, self-control, and will (Anokhin et al., 2011). In another definition, delayed gratification is the resistance of short-term desires to a long-term reward (Zayas et al., 2014). The best example of the distinction of this concept is Wolter Mischel's Marshmallow Test, which concretizes that definition (Mischel, 1974; Mischel & Baker, 1975; Mischel & Mischel, 1983). The experiment investigated whether children would delay instant gratification. Years later, Mischel (2015) contacted the participant children and explored that children who waited a bit longer and earned two marshmallows rather than one instant marshmallow in the test, in other words, delayed short-term gratification and succeeded in receiving a bigger or greater reward, were more successful in their lives. Therefore, the ability to delay gratification seems to be more than an accommodationistic skill. Moreover, this

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**Citation:** Çelikkaleli, Ö. & Özsoy, G. (2022). The Turkish form of the Delaying Gratification Inventory: Validity and reliability studies. *International Journal of Psychology and Educational Studies*, 9(4), 1148-1159. <https://dx.doi.org/10.52380/ijpes.2022.9.4.750>

personality attribute is necessary for the process of socialization alongside the impulses that create pressure to get satisfaction right away (Mischel, 1974). According to Dollard and Miller (1967), delaying gratification is an important condition of making life plans at the same time. Also, during a well-controlled delayed gratification task, an individual is expected to balance the risks of delay in receiving a present reward with the benefits (Gao et al., 2021).

Substance abuse, surplus fat storage in the body, dangerous sexual behavior, psychopathology, guilt, and a lower educational level have all been linked to poor delay of gratification (Baumeister et al., 2007; Bembenutty & Karabenick, 2004; DeWall et al., 2007; Gottdiener et al., 2008; Wulfert et al., 1999). Thus, the tendency to go towards short-term rewards rather than greater ones in the future may lead to undesirable outcomes both for individuals (e.g. lack of personal saving for emergencies) and society overall (e.g. inadequate investments in science and technology in the long run) (Michaelson et al., 2013). In addition, as concluded by the studies, delaying gratification and its psychological, behavioral, health, and financial consequences can be observed from early childhood until the middle age (Mischel et al., 2011). In summary, delaying gratification affects both the psychological and physical health of the individual.

Prominent descriptions of delaying gratification concentrate on the role of self-control, oversensitivity to immediately available rewards, and the cost of time spent for waiting (Benzion et al., 1989; McClure et al., 2004; Zauberman & Lynch, 2005). Accordingly, some of the research studies have shown that higher levels of delaying gratification are associated with more self-control and less impulsiveness (Casey et al., 2011), better academic performance (Duckworth & Seligman, 2005), and more social behaviors (Krueger et al., 1996). Furthermore, the ability to delay gratification has been found to predict career achievement and good relationships in adulthood (Newman et al., 1997). As they put more value on immediate rewards, the inability to delay gratification can often lead to procrastination, especially if taking an action requires immediate costs (Reuben et al., 2015). Numerous studies have explored how the absence of delayed gratification, or having present-biased preferences, is associated with lower academic performance (Golsteyn et al., 2014; Non & Tempelaar, 2016). Consciousness also plays a key role in the ability to delay gratification. Indeed, this ability entails foregoing an immediate pleasure in order to make conscious and deliberate decisions to await another pleasure in the long run (Baumeister et al., 1994). While delaying gratification has been negatively correlated with substance abuse (Abikoye & Adekoya, 2010), obesity (Bruce et al., 2011; Caleza et al., 2016), experiential avoidance (Gerhart et al., 2013), and anxiety and depression (Gerhart et al., 2016), it has been found to be positively correlated with flexibility and decisiveness (Haşçuhadar & Coşkun, 2017), satisfaction with life (Poon et al., 2019), and coping flexibility (Boyraz et al., 2018). Consequently, delaying gratification seems to play a role in several processes, including moral development, planning, addiction treatment, and learning (Dymek & Jurek, 2018). Considering the overall research results, it is possible to argue that delaying gratification enhances the positive psychological attributes while reducing the negative ones.

In sixty years of research on gratification delay, three types of alternative assessment methods have been used (Hoerger et al., 2011). The assessments have been performed with early performance-based strategies, Mischel's behavioral decision-making paradigm, and delay discounting tasks. In addition to being time-consuming, early performance-based strategies have been found to have a discrete theoretical relationship with delaying gratification (Rapaport, 1951), and poor evidence has been reached with regards to its construct validity (Nederkoorn et al., 2006; Singer et al., 1952; Wormith & Hasenpusch, 1979). Mischel's method of behavioral decision-making paradigm has been found to have poor content validity and is not intended to address adult individuals. Moreover, the method's limited number of options indicates that it has poor validity and reliability (Funder et al., 1983; Mauro & Harris, 2000; Mischel, 1958; Wormith & Hasenpusch, 1979). The method of delay discounting tasks has disadvantages, including not being economical in terms of time, covering only one aspect of content, and the costly use of real reinforcers (McLeish & Oxoby, 2007; Smith & Hantula, 2008; Wormith & Hasenpusch, 1979).

Likert measures can be preferred to avoid the disadvantages of delaying tasks. Likert measures stand out among other measuring strategies due to being more practical and providing more psychometric information. In compliance with this method, "Deferment of Gratification Questionnaire" for adults (Ray & Najman, 1986), "Academic Delay of Gratification Scale" (Bembenutty & Karabenick, 1998) and "Multidimensional Delay of Gratification Scale" (Ward et al., 1989) were developed. Baumeister et al. (2007) identified five behavioral areas that are vulnerable to ego fatigue.

These behavioral domains refer to delayed gratification: food, physical pleasures, achievement, money, and social interactions. Specifically, it is observed in the measures developed to date that all domains of measuring the gratification delay are not explicitly addressed. The Deferment of Gratification Questionnaire was developed within a narrow scope, whereas the Academic Delay of Gratification Scale was developed with a focus only on the achievement domain. Finally, factor structure seems not to be supported in the Multidimensional Delay of Gratification Scale. Thus, there is a need for a five-factor measure with adequate psychometric properties to measure gratification delay (Hoerger et al., 2011).

When research is examined, delayed gratification provides the opportunity for increased self-control, emotion control, and coping strategies (Mischel et al., 1989; Schalm et al., 2013); Zayas et al. (2014) found that delayed gratification also reduces anxiety, stress, and depression. Moreover, the ability to delay gratification is closely associated with socio-emotional competence, prosocial behavior, and health-related outcomes such as lower obesity rates and reduced psychopathy (Caleza et al., 2016; Hernandez et al., 2018; Schlam et al., 2013; Supplee et al., 2011; Watts et al., 2018). In several research studies, it is considered significant to include an important personality attribute such as delayed gratification. Yet, there is no Turkish measure for the assessment of gratification delay. It was therefore the aim of this research to adapt the Delaying Gratification Inventory developed by Hoerger et al. (2011) to a Turkish adult sample.

## **2. Methodology**

### **2.1. Research Sample**

Data in the research was collected from three different study groups. The study groups were composed of individuals at the age of 18 or older who volunteered for the research. Firstly, a pilot study was planned with a sample of 124 adults (92 [74.2%] women and 32 [25.8%] men) to ensure compliance of statements in the translation and to finalize the Turkish form. The mean age of those adults was 23.77 (SD= 6.18). Secer (2015) states that if the number of items in the scale is up to 30 in the pilot application, a sample size of around 50 may be sufficient, and if the number of items is 30 or more, a sample size of 2 or 3 times the number of items on the scale may be acceptable. According to this point of view, the data collected from 124 participants is adequate for the pilot application. Next, the validity and reliability of the measure were investigated with a sample of 265 adults (217 [81.9%] women and 48 [18.1%] men). The mean age of those adults was 29.43 (SD= 6.94). In addition, of those adults, 119 (44.9%) were married and 146 (55.1 %) were single. In addition, 7 (2.7 %) of the adults in this group have primary school, 21 (7.9%) high school, 31 (11.7%) associate's degree, 157 (59.7%) undergraduate, 39 (14.7%) have a master's degree, and 10 (3.8%) doctorate degree. Lastly, a test-retest study was performed on a group of 65 adults (50 [76.9%] women and 15 [23.1%] men). Erkus (2013) used the convenience sampling method when forming workgroups. Research data was collected online via Google-form due to COVID-19.

### **2.2. Data Collection Tools**

*Personal Information Form.* In this form created by the researchers, there are four questions to obtain information about the age, gender, marital status and education level of the participants.

*Delaying Gratification Inventory (DGI).* Turkish adaptation of the DGI developed by Hoerger et al. (2011) was conducted within the scope of this research. An item pool that includes 70 items was created for the original form. The scale consists of 35 items related to five different satisfaction areas postponed in daily life and has a 5-point Likert scale. The measure involves reverse-coding items. The internal consistency coefficient of the original form was obtained to be .91. The internal consistency coefficients of the factors ranged from .69 to .89. In addition, the relations between the factors vary between .25 and .58, while the relation between a factor and the total scale varies between .63 and .81. In the confirmatory factor analysis, the fit index values of the scale ( $\chi^2/sd= 32.49$ , CFI= .96, NFI= .96, RMSEA= .05) were found. In the criterion-related validity study, positive and significant correlations were obtained among delaying gratification and self-discipline, self-control, impulse control and well-being, and negatively significant relationships with extravagance, neuroticism, depression and anxiety. The test-retest reliability coefficient was calculated as .88. Higher scores mean gratification latency and a tendency to self-regulate to achieve long-term satisfaction.

*Barratt Impulsiveness Scale – Short Form (BIS-SF)*. Developed by Spinella (2007), BIS-SF was adapted into the Turkish language by Tamam, Güleç, and Karataş (2013). The 15-item BIS-SF is rated on a 4-point Likert scale. There are three- factors in BIS-SF. The measure involves reverse-coded items. In the EFA, factor loadings were calculated between .52 and .71 for “Attention Impulsivity”, .34 and .72 for “Motor Impulsivity” and .66 and .79 for “Non-Planning”. The internal consistency coefficients were obtained to be between .64 and .80 for the factors and .82 for the total scale. Higher scores mean more impulsive behaviors.

*Psychological Well-Being Scale (PWBS)*. The original form of the scale was developed by Diener Wirtz et al. (2010) and its Turkish adaptation was conducted by Telef (2013). The PWBS, which has a 7-point Likert-type rating, and 8-items. Higher scores from the scale refer to increased psychological resources that an individual has. Item factor loadings of the measure vary range .54 to .76. In the confirmatory factor analysis, fit indices were found to be ( $\chi^2/sd= 4.64$ , RMSEA= .08, SRMR= .04, IFI= .95, CFI= .95, RFI= .92, NFI= .94, and GFI= .96). In the reliability study internal consistency coefficient of the scale was found to be .80. In another reliability study, the test-retest reliability coefficient was found to be .86.

### 2.3. Ethical

For the adaptation study, Michael Hoerger was contacted via e-mail and his permit was admitted for the scale’s adaptation to the Turkish adult sample. For the research, approval was received from Muğla Sıtkı Koçman University Non-Invasive Ethical Committee on 09.04.2021 with no. 210144/143. The participants provided informed consent for the study.

### 2.4. Procedure and Data Analysis

The Turkish translation studies were made from the original 35-item form of the scale. Statements in the original form were translated independently by the researchers and three individuals with a doctorate. Based on the feedback from the experts (psychologist and psychiatrist), several corrections were made to ensure cohesion and simplicity of language, and statements in some of the items were changed without compromising the originality. A pilot study was started with 124 adults to evaluate the compliance of the Turkish form, and the items were reviewed in light of the data obtained from the pilot study to finalize the measure.

Following the pilot study, the psychometric properties of DGI were examined. Therefore, the construct validity of DGI was examined with “Exploratory Factor Analysis (EFA)” and “Confirmatory Factor Analysis (CFA)”. For the criterion-related validity, “Pearson’s Product Moment Correlation coefficient” was examined. In addition for the reliability study, it was examined with Cronbach’s alpha, test-retest coefficient (two-week interval) and independent groups t-test whether each item could determine the differences between 27% upper-lower groups.

Finally, sample size and Barlett’s Sphericity test results were examined before the factor analysis. For determining whether the data collected for factor analysis were sufficient, the Kaiser-Meyer-Olkin (KMO) and Barlett’s Sphericity tests were examined. According to Büyüköztürk (2007), a KMO coefficient above .60 and a significant Barlett’s test result are required. In the analysis, the KMO coefficient was found to be .80, and the Barlett’s test yielded  $\chi^2= 3253.114$  ( $p < .001$ ). These findings showed the data to be suitable for factor analysis, which is a multivariate statistic.

Whether the five-factor measure achieved in the EFA was confirmed was tested with the CFA model’s fit.  $\chi^2/sd$  was reviewed to examine the model’s fit of goodness. A  $\chi^2/sd$  smaller than 3 is generally assessed to be a good fit (Kline, 2005). There are also several fit indices to examine the fit of CFA models; “Comparative Fit Index (CFI)”, “Adjusted Goodness of Fit Index (AGFI)”, “Goodness of Fit Index (GFI)”, “Incremental Fit Index (IFI)”, and “Root Mean Square Error of Approximation (RMSEA)” are commonly used. CFI, IFI, AGFI, and GFI values of .95 and above mean perfect fit whereas values of .90 and above are described as good fit (Hu & Bentler, 1998). A RMSEA value below .05 is assessed to be a perfect fit, while .08 refers to an acceptable fit (Browne & Cudeck, 1993). SPSS 22.0 and AMOS 20.0 software packages were used for data analysis.

### 3. Findings

In the study, skewness and kurtosis values were -.09 and -.33 for delaying gratification; -.51 and -.35 for psychological well-being; .41 and -.41 values were found for impulsivity. It has been said that values in the range of  $\pm 1.5$  will be considered as a normal distribution (Tabachnick & Fidell, 2014).

#### 3.1. Findings on Validity of the Inventory

As indicated in Figure 1, while examining the factor structure of the measurement tool, the scree plot was examined using the varimax rotation technique. Care was taken to ensure that the eigenvalue was above 1 in the scree plot. However, the 5-dimensional structure of the original form was not exceeded.

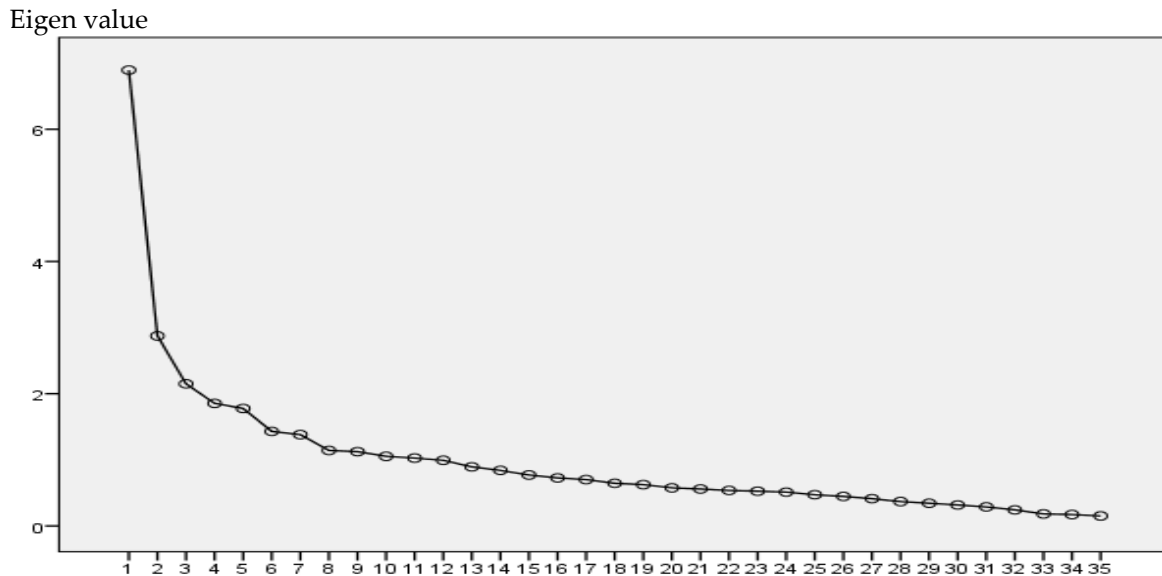


Figure 1. Scree Plot Graphic

Based on the findings achieved in the EFA, item 3 was omitted from the measure due to its low item-total test correlation value (.19). Furthermore, items 2, 6, 9, 15, 17, 25, and 35 were omitted from the measure because they were included in different factors. Finally, items 13 and 21 were omitted from the measure as they were cyclical. Content validity was reviewed with the remaining 25 items. The findings obtained from the validity and reliability studies for DGI are presented in Table 1. Following these procedures, a CFA was performed to test whether the five-factor structure of the measure was confirmed with the remaining items. As a result, items 26, 30, and 28 were omitted from the measure because they had no significant path coefficients in their respective subscales. As for the modification indices of the five-factor model, item 34 was not included in the analyses due to its semantic resemblance with item 24 and the final structure shown in Figure 1 was achieved. The validity and reliability study proceeded with the remaining 21 items.

As presented in Table 1, item factor loadings of DGI differ between .38 and .85. The five-item Delaying Gratification of Eating (DGE) subscale has item factor loadings between .56 and .75. The five-item Delaying Physical Gratification (DPG) subscale has item factor loadings of between .38 and .54. The five-item Delaying Monetary Gratification (DMG) subscale has item factor loadings between .69 and .85. The four-item Delaying Social Gratification (DSG) subscale has item factor loadings between .39 and .75. The four-item Delaying Gratification of Achievement (DGA) subscale has item factor loadings between .40 and .83. DGI with an eigenvalue of 12.9 has a five-factor structure which explains 52% of the variance of gratification delay. 16.10% of the variance is explained by the DGE subscale with an eigenvalue of 2.66, which explains 10.65% of the variance. DPG subscale with an eigenvalue of 2.07 explains 8.28% of the variance. DMG subscale with an eigenvalue of 4.03. 7.72% of the variance is explained by the DSG subscale with an eigenvalue of 1.93. 8.88% of the variance is explained by the DGA subscale with an eigenvalue of 2.22.

**Table 1.** DGI Item Factor Loading, Item-Total Test Correlations and Independent Samples t-Test Results

Items	Food	Physical	Social	Money	Achievement	ITTC	Results for Upper and Lower Groups Independent Samples t-Test
Item1	.75					.38	-31.18*
Item 2	.52					.38	-26.30*
Item 11	.62					.35	-33.10*
Item 16	.71					.34	-45.10*
Item 17	.47					.39	-27.71*
Item 21	.42	.41				.53	-20.37*
Item 26	.56					.52	-3.33*
Item 31	.71					.39	-44.40*
Item 6		.34				.34	-37.73*
Item 7		.49				.30	-15.34*
Item 9		.50				.34	-27.02*
Item 12		.51				.33	-29.15*
Item 15		.52				.29	-36.59*
Item 22		.54				.35	-30.44*
Item 25		.53				.49	-53.89*
Item 27		.52				.44	-27.55*
Item 32		.38				.44	-38.39*
Item 35		.59				.46	-31.72*
Item 4			.70			.36	-30.14*
Item 14			.78			.51	-35.52*
Item 19			.81			.51	-30.34*
Item 24			.69			.54	-28.69*
Item 29			.85			.52	-13.91*
Item 34			.78			.58	-34.19*
Item 3				.20		.19	-17.77*
Item 8				.67		.01	-25.56*
Item 13				.36	.30	.19	-23.73*
Item 18				.75		.21	-31.26*
Item 23				.45		.11	-30.74*
Item 28				.39		.11	-24.75*
Item 33				.51		.16	-26.40*
Item 5					.82	.39	-33.60*
Item 10					.83	.40	-32.17*
Item 20					.44	.30	-24.18*
Item 30					.40	.46	-18.94*
N	=265	* p<.01					
% of Variance	10.65	8.28	16.10	7.72	8.88		
Eigenvalues	2.66	2.07	4.03	1.93	2.22		

EFA= Exploratory Factor Analysis, ITTC= Item-Total Test Correlation

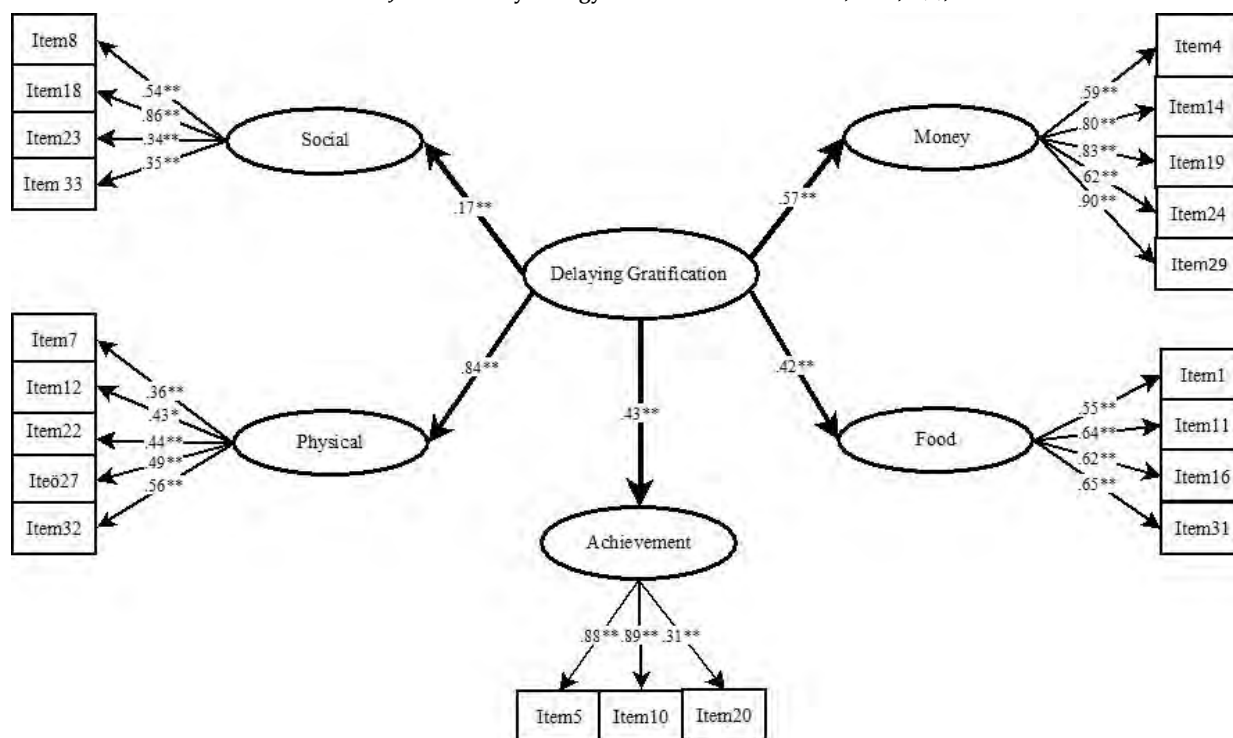


Figure 2. Path Diagram Obtained from the CFA

The fit index values of the model were achieved in the CFA, and its chi-square value ( $\chi^2 = 352.97$  N= 265, sd= 184,  $p = 0.00$ ;  $\chi^2/sd = 1.92$ ) was found to be significant. Fit index values were calculated to be (RMSEA= .059, CFI= .90, IFI= .90, GFI= .89, and AGFI= .86). As shown in Figure 2, the regression values for the items range between .31 and .90 ( $p < .01$ ).

### 3.2. Criterion-Related Validity

Table 2. Correlation Values between Impulsiveness, Psychological Well-Being and Delay of Gratification

Variables	$\bar{X}$	Ss	1	2	3	4	5	6	7	8
1-BIS-SF	27.52	6.87	1	-.52**	-.60**	-.23**	-.45**	-.16**	-.37**	-.50**
2- PWBS	44.68	7.26		1	.52**	.31**	.44**	.08	.39**	.32**
3-DGI	79.94	10.0			1	.60**	.70**	.32**	.55**	.71**
4-DGE	14.15	14.5				1	.26**	.001	.20**	.19**
5-DPG	18.59	18.59					1	.15**	.25**	.37**
6-DSG	16.10	16.10						1	.11	-.04
7-DGA	11.83	11.83							1	.26**
8-DMG	19.27	19.27								1

\*\*  $p < .01$

In the criterion-related validity study for DGI, negative significant correlation were found between scores of DGI and its subscales and BIS-SF whereas correlation between the scores of DGI and its subscales and PWBS were found to be positive significant ( $p < .01$ ). In summary, psychological well-being increases and impulsiveness decreases with an increasing delay of gratification among adults.

### 3.3. Findings on Reliability of the Inventory

A Cronbach's alpha internal consistency coefficient of were calculated .78 for DGI in total, .86 for DMG, .56 for DPE, .58 for DSG, .72 for DGA, and .74 for DGE. The test-retest coefficient were calculated to be .84 for DGI in total, .86 for DMG, .78 for DPE, .51 for DSG, .74 for DGA, and .86 for DGE. Moreover, the items were found to be able to significantly discriminate scores of delayed gratification for the individuals in the lower and upper 27% groups that were generated based on the mean score (Table 1). In other words, a significant difference among the scores of individuals in lower and upper groups indicates that the items can discriminate against the individuals with regard to the behavior to be measured (Büyükoztürk, 2007).

#### 4. Conclusion and Discussion

DGI was designed to ensure practical and psychometric benefits over previous measuring methods (Mauro & Harris, 2000; Nederkoorn et al., 2006; Smith & Hantula, 2008), which makes it effective in the acceleration of social and behavioral public health studies (DeWall et al., 2007; Gottdiener et al., 2008). Therefore, basic validity and reliability studies of DGI were performed in a Turkish adult sample in the research.

An EFA, CFA, and criterion-related validity analysis was realized to test the test measure's validity level. Based on the EFA and CFA findings, the five-factor structure was proven in the Turkish adult sample. However, unlike the original form, the five-factor structure is explained with 21 items. This is because no EFA was performed for the construct validity of the DGI original form and there might be intercultural semantic differences. The measure explains 52% of the variance. This rate is acceptable due to being above .30 (Büyüköztürk, 2007). Factor loadings of the measure vary between .39 and .85. This finding indicates that factor loadings are acceptable due to being above .30 (Büyüköztürk, 2002; Kline, 1994).

The model's fit indices were reviewed based on the CFA result, and the Chi-square value was found to be significant [ $\chi^2$ : 352.97 N: 265, sd: 184, p: 0.00;  $\chi^2$ /sd: 1.92]. Fit indices were found to be RMSEA= .05, CFI= .90, IFI= .90, GFI= .89, and AGFI= .86. Those fit indices coincide with the fit indices achieved in the Spanish (Espada et al., 2019) and Polish (Dymek & Jurek, 2018) forms. As argued by Bryne (2001), those fit indices are acceptable.

As for the criterion-related validity, significant correlations were obtained among the delayed gratification inventory and the psychological well-being and impulsiveness scales. Consequently, delaying gratification seems to have a positive significant correlation with psychological well-being and a negative significant correlation with impulsiveness. It is possible to say that those correlations are similar to the ones achieved for the original form. Accordingly, one can argue that the behavior of delaying gratification increases impulse control, health, and psychological well-being while reducing risky behaviors (Hoerger et al., 2011). These findings reinforce the research findings which associate gratification delay with psychosocial adaptation (Ramanathan & William, 2007).

To examine the distinctiveness of DGI items, item-total test correlations were calculated, and correlation values of all items except the ones in the DSG subscale were found to be between .30 and .58. Erkuş (2012) states that a value above .30 indicates item distinctiveness. Accordingly, it is possible to say that statements in DGI are distinctive for measuring the behavior of delayed gratification. However, items in the DSG subscale were not omitted from the measure because their factor loadings obtained in the EFA were above .30 and they were significant in terms of path coefficients achieved in the CFA.

The Cronbach's alpha coefficient was found to be .78 for the measure's reliability. The subscales were found to have internal consistency coefficients of between .56 and .86. In the Spanish adaptation study, the internal consistency coefficient was found to be .80 with the whole scale. In the relevant form, the subscales were found to have internal consistency coefficients of between .60 and .82 (Espada et al., 2019). In the Polish adaptation study, the internal consistency coefficient was found to be .87 with the whole score, and the subscales were found to have internal consistency coefficients of between .55 and .83 (Dymek & Jurek, 2018).

These findings on the reliability of the measure coincide with the findings obtained in other adaptation studies. The internal consistency coefficient indicates whether items reliably measure a given property. It is stated that internal consistency coefficients of .70 and above for Likert scales developed to measure psychological variables are acceptable for reliability (Büyüköztürk, 2007; Fraenkel et al., 2012). The DPG subscale's low internal consistency could be attributed to cultural differences (Dymek & Jurek, 2018). Cultural values might have influenced the answers to some of the statements in the DPG subscale.

The test-retest coefficient was calculated to be .84 for the whole measure. The subscales were found to have test-retest coefficients of between .51 and .86. In the Brazilian adaptation study, the test-retest coefficient was calculated to be .87 for the whole measure. In the same study, the subscales were found to have test-retest coefficients of between .80 and .92 (de Paula et al., 2018). The test-retest coefficient was calculated to be .76 for the total measure in the Spanish adaptation study. In the relevant form, the subscales were found to have test-retest coefficients of between .54 and .68 (Espada et al., 2019). The test-retest coefficient was calculated to be .85 for the whole measure in the Polish adaptation study, and the subscales were found to have test-retest



coefficients of between .53 and .88 (Dymek & Jurek, 2018). Test-retest coefficients calculated for the Turkish form are notably lower than those for the Brazilian form and similar to those for the Polish and Spanish forms. According to Tezbaşaran (1996), a reliability value of .70 or above is considered sufficient for measures. It can therefore be argued that DGI is a consistent and stable measure.

In another reliability method, it was determined whether the answers of the participants to each item significantly discriminated between upper and lower 27 % groups. It was found in the analysis that the measure could discriminate between individuals with lower and higher levels of gratification delay (Erkuş, 2007). In other words, the significant intergroup difference refers to item distinctiveness (Erkuş, 2013).

The results of the studies on the validity and reliability and the literature review on delaying gratification show that the measure possesses sufficient psychometric values for the Turkish adult sample.

## 5. Limitations and Recommendations

There are a few limitations to the research. For instance, the fact that the research comprises 265 data points is a limitation with respect to generalizability. Lack of linguistic equivalence analysis for the measure can be considered a limitation as well. Lastly, it is possibly a limitation to have examined the criterion-related validity with two variables. DGI is a valid and reliable measure to assess behaviors that delay behaviors. Studies can be carried out with DGI to explore the correlation between delaying gratification and depression, stress, academic achievement, and neuroticism. The role of delayed gratification in obesity can also be investigated.

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