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Aleksandra Dymek\*  
Pawel Jurek\*

### Polish Validation of the Delaying Gratification Inventory

**Abstract:** *Delaying of gratification is the ability to defer immediate reward for long-term goals (Mischel, Ebbsen, 1970). The inability to do so may lead to health problems connected with, for instance, stimulants, risky sexual behaviors or binge eating (Hoerger, Quirk, Weed, 2011). In Poland there is no inventory measuring the aforementioned phenomenon. That is the reason why Polish validation of the Delaying Gratification Inventory (DGI) is really desirable. The article presents collected results related to the factor structure and reliability of the Polish version of the DGI. Additionally, its outcomes were correlated with results of the Polish version of the Self-control Scale (Tangney, Baumeister, & Boone, 2004; Polish validation: Pilarska & Baumeister, 2018) and the Risky Behaviors Test (Studenski, 2004) to precise its validity. The whole questionnaire with the key for further use is enclosed.*

**Keywords:** *gratification delay, test validation, self-control, risky behaviors*

#### Theoretical Framework

Delaying of gratification is an ability to wait for a better prize to be gained in the future instead of getting immediate pleasure (Mischel & Ebbsen, 1970). The best example of this phenomenon is Mischel's experiment, called Marshmallow Test which embodied this definition (Mischel, 1974; Mischel & Baker, 1975; Mischel & Mischel, 1983). It investigated if children were able to delay immediate gratification. Each child was asked to sit at the table. In front of them there were a bell and two covered plates – the first with one marshmallow and the second with two marshmallows. Experimenter informed that he/she had to leave the room for a while but child could call for him/her whenever wanted by ringing a bell. After that experimenter uncovered plates. He/she instructed the child further on that if it waited for experimenter's return, it could get two marshmallows. In turn, if it did not want to wait so long, could ring a bell but then could get only one marshmallow. Also, starting to eat the treat or getting out of the chair was rewarded with only one marshmallow. After years Mischel (2015) contacted examined kids and discovered that those who had been able to wait for experimenter became more successful in life. Therefore, an ability to delay gratification is apparently more than accommodative ability. Moreover, it is essential for

socialization process altogether with suppressing impulses (Mischel, 1974). According to Dollard and Miller (1967) it is also, after adequate length of future time perspective, second condition of making life plans. Inability of delaying of gratification may lead to health problems connected with, for instance, binge eating, stimulants, or risky sexual behaviors (Hoerger et al., 2011).

On the basis of data analyses from past researches and Baumeister's, Vohs's, and Tice's (2007) five domains of behavior description, Hoerger, Quirk and Weed (2011) proposed five-domain structure of gratification delay: a) food, b) social interactions, c) money, d) achievement and e) physical pleasure. What additionally convinced them about reasonableness of the aforementioned structure were the studies that characterized at least two of the assumed five domains of delay behavior (e.g. Bembenuddy & Karabenick, 2004; Ramanathan & Williams, 2007; Lee et al., 2008). Thus, general level of delaying gratification is resultant of all five domains. Following Mischel (1974), advanced form of gratification delay makes human impose restrictions on himself. Furthermore, author basing on Berlyne's (1969) stimulus concept, demonstrated that stimulus prompts consumption desire (an individual seeks stimulus) when it performs motivational function (mostly actual stimulus). In that situation delay of gratification causes frustration. In turn, if stimulus performs informative

\* Institute of Psychology, Faculty of Social Sciences, University of Gdansk

function as a symbolic prize, an incidence of gratification delay and manifestation of long-term goal oriented acts are more likely (Mądrzycki, 2002). However it is worth mentioning that the longer individual waits, the less attractive gratification becomes (Reykowski, 1975). Accomplishing long-term tasks is favored by increment of internal motivation (Mori et al., 2015). To encourage the delay of gratification an individual should concentrate on cold (neutral, non-tempting) features of stimulus that provide information about, for instance, size and shape of candy, instead of focusing on its taste (hot stimulus) (Mischel, 2015). Moreover, it is easier for an individual to delay gratification when he/she is in a good mood. Each hot stimulus could be modified by cognitive reinterpretation and an active prefrontal cortex is a crucial element in this process.

To help demonstrate the essence of delaying of gratification one issue should be highlighted. On the basis of the presented theory, the inability to delay gratification may be a cause of risky behavior, for instance, alcohol abuse (Hoerger et al., 2011). Risky behavior can be defined as an ensemble of actions or activities that escalate danger of harm to the subject (Cyders et al., 2007). We believe that there is need to emphasize that inability of delaying of gratification may be a cause but it is not a certain, and main reason of risky behavior. Those are related, yet separate constructs (Cohen & Lieberman, 2010). The study was conducted on a group of 14–22 year old adolescences ( $N=900$ ) and results showed, inter alia, that the tendency of risky behaviors (tobacco, alcohol and marijuana abuse) inversely correlates with delaying of gratification (Romer, Duckworth, Sznitman, & Park, 2010). However, this statistically significant ( $p < .05$ ) correlation was very low ( $\beta = -.072$ ) when the model included sensation seeking, gender, age and ethnic identification. Even though the results are unambiguous, there is still a tendency to interpret this relationship as quite strong (Romer et al., 2010; Teuscher & Mitchell, 2011). Obviously, it must be noted that delaying of gratification as a self-control's component (Mischel, 1974) also takes part in preventing from risky behaviors but it is a rather subsidiary role.

Delay of gratification, as it was mentioned, is a self-control's component that is why it is hard to analyze those phenomena separately as they are interdependent (Gailliot et al., 2007). Becoming acquainted with the self-control literature, various definitions may be encountered what is the result of different approaches of their authors. Analyzing articles three distinct ways of perceiving self-control may be noticed (Kofta, 1979). Following the first approach, self-control is an attribute of human personality that decides about intensity and frequency of behaviors such as: suppressing unwanted impulses, resisting temptations, resisting immediate needs satisfying in order to get delayed gratification and (or) get satisfaction in a way that is socially approved. By describing self-control as ability, its relative stability and generality are assumed. That is how "ego strength" and "ability to delay gratification" are perceived, so self-control in psychoanalytic conceptualization.

Second approach describes self-control as a controlling behavior. Therefore, it is a descriptive concept embracing occurrence and intensity of characteristic controlling acts that were aforementioned in the previous point. Third way of reasoning about self-control characterizes it as a psychological mechanism thanks to which controlling actions are performed. In other words, self-control is a chain of internal regulative processes that decide about performing actions approved by society and subject himself/herself. Understanding those processes is dependent on branch of psychology researcher deals with.

One of the best-known self-control researchers, Roy F. Baumeister, along with many co-workers, defines this phenomenon as a highly adaptive (e.g. Uziel & Baumeister, 2017) ability to transform individual's behaviors, emotions and thoughts or to break habits and suppress temptations (e.g. Maranges & Baumeister, 2016). It allows an individual to monitor and regulate himself/herself to meet expectations imposed by himself/herself or society, containing norms, laws, ideals etc. Pointing out future time orientation aspect of self-control, this human capacity suppresses immediate, short-term impulses which are conflicted with long-term targets (Wiese et al., 2017; Hofmann et al., 2012). Baumeister (e.g. Muraven & Baumeister, 2000) formulated the strength model of self-control that assumes depletion of this resource as a consequence of intensive usage, altogether with being strengthened over time, like a muscle. *Ego depletion* is a term referring to the state of a person no longer able to perform self-control successfully. However, there are some authors who not entirely believe in this theory, questioning physiological nature of ego-depletion, as effect of this phenomenon can be reduced or entirely eliminated after proper psychological manipulation (Savani & Job, 2017) like positive affect (Tice, Baumeister, Shmueli, & Muraven, 2007), monetary incentives (Muraven & Slessareva, 2003) or self-affirmation (Schmeichel & Vohs, 2009). That is why motivational not physiological costs of ego-depletion are more eagerly supported (Kitayama & Tompson, 2015). Thus, inability to control oneself after intensive usage of this capacity during main task could be explained by individual's low motivation level to expend self-control on subsequent activities.

Hoerger et al. (2011), basing on Funder & Block (1989), consider self-control as a continuum of three elements, including controlling impulses, ego resiliency and delaying of gratification in the middle. Gratification delay has common features with both other constructs – with impulse control resisting strong rewards, what can be disadvantageous from time to time, along with having traitlike features (Baumeister & Vohs, 2004; Funder & Block, 1989), and with ego resiliency future time orientation, including cautiously weighing consequences, altogether with having ability features (Bembenutty & Karabenick, 2004; Funder & Block, 1989; Twenge, Catanese, & Baumeister, 2003). Therefore, operationalization of the gratification delay contained posing choices between tempting immediate

rewards and relevant long-term implications (Hoerger et al., 2011).

Self-control techniques can be contrasted with defense mechanisms (Kuc, 1984). The later are used for quick unpleasant tension eliminating, so subject using them exhibits emotional and moral immaturity inasmuch he/she shows hedonistic attitude. Self-control techniques are rational and usage of them is often accompanied by suffering and frustration. Thanks to them, making plans and anticipation are possible, so they are some kind of farsighted instrument that considers multi-level construction of goals, connected with professed value hierarchy. Subject who uses self-control techniques is characterized by: internal locus of control, ability to delay gratification, ability to anticipate and plan, ability to look at your own self objectively, high maturity and rich personality. Specific act may be described as a self-control, if subject: (1) on his/her own demarcates canon of behavior that he/she wants to pursue, (2) finds himself/herself in a situation where he/she has to make a decision and choose one of two mutually exclusive reactions – action that results in getting temporary reward along with a risk of getting punishment in a distant future, or action that results in getting delayed gratification that is more valuable, (3) by himself/herself chooses action less probable, at the same time suppressing action more probable, to get delayed reward that has more gratifying value (Kuc, 1984).

It is worth to mention that self-control and self-regulation are usually treated as synonyms (Brycz, 2006). However, self-control is included in self-regulation as self-control is connected with control over impulses, whereas self-regulation includes many types of regulation, even physiological one. That is why those terms cannot be synonyms as self-regulation is wider than self-control.

To conclude, delaying of gratification, as a self-control's component is involved in many processes such as moral development, planning, addiction treatment, learning etc. On that account, it is worth to be included in various studies. However, in Poland, there is not such possibility as there is no Polish instrument that measures aforementioned phenomenon. This article provides Polish version of The Delaying Gratification Inventory developed by Hoerger et al. (2011), so reliable and valid questionnaire that could help in developing many fields of psychology, for instance developmental psychology, cognitive psychology, social psychology etc.

### Development and Validation of the Delaying Gratification Inventory

The Delaying Gratification Inventory (DGI) developed by Hoerger, Quirk and Weed (2011) was originally validated in English on large ( $N=10,741$ ), worldwide samples via Internet. Four studies provided results that pointed to strong internal consistency along with test-retest reliability for the final 35-item version of the DGI, its shorter 10-item form, and every domain of the test. The assumed five-factor model had good fitting to the data and

good measurement stability among subgroups. Internal consistency reliability from studies with U.S. participants ( $N=4,925$ ) was strong for scores on the DGI-35 composite scale (.91), good for scores on the DGI-10 short form (.79) and good for each of the five domains of gratification delay: Food (.75), Physical (.71), Social (.81), Money (.89), and Achievement (.85) (Hoerger et al., 2011). Correlating the DGI with tests that relate to self-control, behavior, personality traits from Big Five, adjustment, and psychopathology confirmed validity of the construct. In addition, authors provided proofs of Internet-mediated researches suitability.

### Present Studies

The present investigation involved two studies on the validation of the Polish version of the Delaying Gratification Inventory (DGI) developed by Hoerger, Quirk and Weed (2011)<sup>1</sup>. In Study 1 we focused on factor analysis and reliability analysis, using a large, diverse sample of Polish adults ( $n=1,051$ ). The test-retest reliability was examined for a subset of participants ( $n=58$ ) completing the measure twice. Whereas Study 1 focused on internal consistency, test-retest reliability and factor structure, Study 2 ( $n=404$ ) was designed to provide evidence of validity involving correlates of the resulting survey's scores. Therefore, the aim of this research is to provide Polish version of the DGI, to prove its reliability and five-factor structure, as well as to confirm the theoretical framework validity. To perform the last part of the study, multitrait-multimethod matrix of Campbell and Fiske (1959) should be applied. However it was impossible, as there was no other method in Poland that measures gratification delay. That is why we decided to perform two types of correlation instead. The first was an interrelationship between gratification delay and its closest construct – self-control. The second was a discriminant validity acquired by correlating delaying of gratification with tendency of risky behaviors, as we believe that, on basis of aforementioned theory, there is need to spotlight the actual relation between the last two variables.

### Study 1

#### Method

##### *Inventory translation*

The DGI was translated into Polish by following the recommendations of Guidelines for Translating and Adapting Tests (*International Test Commission*, 2005). The first step was to translate the test from English to Polish. It was performed by three independent translators who finally presented one version. There was a problem with the third item because of unique expression that has no Polish equivalent (“I hate having to take turns with other people”) but after few consultations, including professional translator, we managed to find adequate equivalent. Then,

<sup>1</sup> Adaptation was done with the permission of the authors.

the test was translated back to English by one translator. After the whole procedure the original questionnaire was compared with new English version. The obtained results were satisfying.

*Participants and procedure*

We collected data from 1,051 Polish adults. Participants were diverse in terms of age (833 between 20 and 40 years, 218 more than 40 years), gender (378 men and 673 women), and education level (53.8% with university degree; 46.2% completed secondary school or lower). Study was conducted both via Internet and in traditional way by giving responders paper questionnaires. Regardless of the fact if it was paper or on-line version, it was the same test preceded by demographic information and instruction for everyone.

*Measures*

All study measures were completed in Polish. Participants provided demographic information, including gender, age and highest grade completed.

**DGI.** The 35-item scale yields gratification delay scores for five domains (food, physical pleasures, social interactions, money, and achievement), a 35-item composite (DGI-35), and a 10-item short-form composite (DGI-10). Seventeen items are reverse-coded, and participants reported how well each item described them, using a scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

**Results and Discussion**

The results of Study 1 were used to validate a 35-item scale, covering the five domains of gratification delay. Additionally, followed by authors of the original version of the DGI, we compose the DGI-10 short form by selecting two items from each domain with highest item–total correlations (see Table A1 in the supplemental materials, Appendix A). Compared to the original scale, the results from the Polish samples showed weak properties of the item 3, which was removed from the Polish version of the scale (DGI-34 score was used in further analyzes). Scale means, standard deviations, internal consistency reliabilities, and intercorrelations are shown in Table 1.

Internal consistency reliability was strong for scores on the DGI-34 composite scale (.85) and good for scores on the DGI-10 short form (.71). Thus, both the long and short forms produced reliable measurements of general individual differences in gratification delay. Four out of five subscales scores also had good reliability (alpha from .67 to .80). The exception is the *Physical* subscale (internal consistency coefficient was .56). Measurement of this aspect in the Polish version of the scale is not recommended. As with the original version of DGI scale, subscale scores were modestly intercorrelated (*r* from .20 to .48). Items of the DGI-34 loaded relatively uniquely on their designated domains. As expected, the five domains had modestly overlapping variance but also accounted for unique aspects of gratification delay.

We conducted an analysis to examine test-retest reliability. Among all participants, 58 self-reported having completed the measure twice. The duration between testing was approximately three months. Table 2 shows descriptive statistics and test–retest correlations ( $r_{tt}$ ). Although a more detailed follow-up is needed, available evidence supports strong test–retest reliability of DGI scores.

**Table 2. Test-retest reliability of the Polish version of the Delaying Gratification Inventory**

Score	Test		Re-test		$r_{tt}$
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Food	23.50	4.46	24.02	4.92	.88***
Physical	24.69	3.75	24.86	3.93	.79***
Social	24.47	3.17	22.79	2.14	.53***
Money	27.60	4.85	26.12	3.80	.78***
Achievement	24.76	4.61	25.71	4.59	.80***
DGI-10	37.10	4.77	37.55	5.42	.79***
DGI-34	125.02	13.01	123.50	14.18	.85***

Note. *N* = 58. \*\*\* *p* < .001

**Table 1. Polish version of the Delaying Gratification Inventory (DGI) Scale Score Properties in Studies 1**

Scale	<i>M</i>	<i>SD</i>	Food	Physical	Social	Money	Achiev.	DGI-10 <sup>2</sup>	DGI-34
Food	23.53	4.54	(.67)						
Physical	24.65	3.73	.48	(.56)					
Social <sup>1</sup>	23.16	3.73	.20	.33	(.80)				
Money	27.41	4.74	.34	.41	.25	(.79)			
Achievement	24.90	4.56	.33	.43	.34	.36	(.75)		
DGI-10	36.05	5.06	.61	.63	.55	.56	.63	(.71)	
DGI-34	123.65	14.86	.68	.75	.56	.69	.72	.87	(.85)

Note. *N* = 1,051. <sup>1</sup> If item 3 has been skipped. <sup>2</sup> Items: 2, 6, 10, 17, 18, 21, 23, 24, 25, and 29. All correlations were significant at *p* < .001. Alphas are indicated in parentheses.

Confirmatory factor analysis (CFA) supported the hypothesized five-factor model of gratification delay in a Polish sample. CFA model fit was examined with the R system for statistical computing (*The R Core Team*, 2017) and the R package lavaan (Rosseel, 2012), using unweighted least squares estimator (ULS) for ordinal data. Multiple model fit indices were reported, including the chi-square statistic ( $\chi^2$ ), comparative fit index (CFI), the root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR). To assess the fit of the model to the data, we used the criteria recommended by Brown (2015) and Kline (2016). We accepted CFI values greater than .90 and RMSEA and SRMR values lower than .08. The hypothesized five-factor model fits the data well:  $\chi^2_{\text{ULS}}(df)=2,274(517)$ , CFI=.92, RMSEA=.057, SRMR=.060 and provides a significantly better fit than the uni-dimensional model:  $\chi^2_{\text{ULS}}(df)=4,362(527)$ , CFI=.49, RMSEA=.083, SRMR=.086 ( $\Delta\chi^2=2,088$ ;  $\Delta\text{CFI}=.43$ ). For results of confirmatory factor analysis (factor loadings, covariances), see Table A2 and Table A3 in the supplemental materials (Appendix A).

## Study 2

### Method

#### Participants and procedure

We collected data from 404 Polish adults (87 men and 375 women) between 20 and 40 years. Participants were diverse in terms of education level (53.5% with university degree; 46.5% completed secondary school or lower). Study was conducted via Internet and every survey contained 3 tests preceded by demographic information and instruction.

#### Measures

As in the case of Study 1, participants answered demographic questions and filled in the DGI. In addition,

participants were asked to complete two questionnaires: one, measuring self-control, the other tending to risky behaviors. The order of instruments was randomly chosen by drawing lots and identical for every respondent.

**Self-Control Scale.** Participants completed the 36-item Polish version of the Self-Control Scale (Tangney, Baumeister, & Boone, 2004; Polish validation: Pilarska & Baumeister, 2018) primarily taps impulse control but also hits loosely on delay of gratification, competencies, and conscientiousness, with items like “I am good at resisting temptation” rated on a scale from 1 (*not at all*) to 5 (*very much*).

**Risky behaviors.** Risky Behaviors Test (Studenski, 2004) measures the attitude to difficult or dangerous tasks, with 25 items such as “I do things that I know are dangerous” and “Although I know what is harmful to me, I do not avoid it” rated on a scale from 0 (*very rarely or never*) to 4 (*very often*).

### Results and Discussion

Table 3 shows validity evidence for DGI scores in Study 2. In general, DGI composite scores correlated strongly with measure of the self-control ( $r=.71$  for full scale and  $r=.68$  for short scale), which is a closely related constructs (convergent validity) and poorly correlates with measure of the risky behaviors tendency ( $r=-.18$  for full scale), which is a theoretically different constructs (discriminant validity). Among the five domains, the food and the physical domain scores correlated most highly with self-control, same as the money and the achievement domain. The physical domain scores correlated most highly with risky behaviors; however, the interpretation of these results is limited due to the low reliability of physical subscale. The social domain was most distinct, which is consistent with the results of the study using the original scale (Hoerger et al., 2011).

**Table 3. Descriptive statistics, Cronbach's alphas and correlations between Delaying Gratification Inventory scores, Self-control, and Risky behaviors tendency in Study 2**

Variable	<i>M</i>	<i>SD</i>	Self-C	Risky b.	Food	Physical	Social	Money	Achiev.	DGI10	DGI34
Self-control	108.95	19.04	(.89)								
Risky behaviors	27.91	18.88	-.24***	(.96)							
Food	22.30	4.55	.58***	-.04	(.67)						
Physical	24.19	3.70	.59***	-.28***	.49***	(.55)					
Social	23.76	3.67	.24***	-.16**	.15**	.35***	(.82)				
Money	27.46	5.02	.48***	-.20***	.31***	.40***	.22***	(.83)			
Achievement	24.15	5.02	.49***	-.01	.30***	.43***	.31***	.33***	(.81)		
DGI10	35.39	5.53	.68***	-.10	.67***	.69***	.50***	.61***	.68***	(.71)	
DGI34	121.84	14.97	.71***	-.18***	.67***	.76***	.55***	.69***	.72***	.93***	(.87)

Note.  $N=404$ , \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ . Alphas are indicated in parentheses.

## General Discussion

Validation of Delaying Gratification Inventory allows to extend field of psychological research in Poland by making it possible to take under consideration the ability to defer gratification. Presented work provides Polish 34-item equivalent of the DGI and its shorter, 10-item version. Results are satisfying and may be drawn on the grounds of them the following conclusions.

First of all, five-factor model of the gratification delay was confirmed in Polish background. That proves validity of the concept that has strong theoretical support, aforementioned at the beginning of this article. In addition, comparison of reliabilities of English and Polish versions of measurement might point to similarity of the test and five-factor model structure.

Secondly, it turned out that the third item must be omitted in the calculation of results for individual diagnosis due to its weak psychometric properties. The problem can result from misformulation of the statement and its insufficient precision. The item relates, in fact, only to feelings and attitude towards waiting and it is rather common and obvious that no one is willing to wait, especially when someone is in hurry. However, it is ambiguous when it comes to not doing it after all. Thus, in Polish context, this item does not clearly measure the ability to wait in queue for getting “a reward” and probably that is why it correlates with measurement on such low level. However, for cross-culture measurement invariance studies, we suggest using the full 35-item DGI version. There is a possibility that in other countries further validations of this measurement would also demand same modification.

Next conclusion is related to low reliability of physical domain. This aspect may be caused by cultural differences. We assume that physicality is among Poles still some kind of taboo. Nevertheless, this issue requires further research. In this connection, we recommend caution in interpreting delaying of gratification in terms of physical domain.

Furthermore, instrument demonstrated its test-retest stability what confirms reliability of measurement. In addition, that characterized the ability of delaying gratification as on basis of theory, it is relatively stable construct (Kofta, 1979).

It was also concluded that high and positive correlation with self-control, as well as, low and negative correlation with risky behaviors, matches with previously presented theory, what additionally proves validity of the verified measurement.

## References

- Baumeister, R.F., & Vohs, K.D. (2004). Understanding self-regulation: An introduction. In: R.F. Baumeister (Ed.), *Handbook of self-regulation: Research, theory, and applications* (p. 2). New York, NY: Guilford Press.
- Baumeister, R.F., Vohs, K., & Tice, D. (2007). The strength model of self-control. *Current Directions in Psychological Science*, 16, 351–355.
- Bembenutty, H., & Karabenick, S. (2004). Inherent association between academic delay of gratification, future time perspective, and self-regulated learning. *Educational Psychology Review*, 16, 35–57. doi: 10.1023/B:EDPR.0000012344.34008.5c
- Berlyne, D.E. (1969). *Struktura i kierunki myślenia*. Warszawa: PWN.
- Brown, T.A. (2015). *Confirmatory Factor Analysis for Applied Research* (2nd ed.). New York: Guilford Press.
- Brycz, H. (2006). Strategie samoregulacji w obliczu doznanej porażki. *Przegląd Psychologiczny*, 49(4), 399–418.
- Campbell, D.T., & Fiske, D.W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56(2), 81–105.
- Cohen, J.R., Lieberman, M.D. (2010). The common neural basis of exerting self-control in multiple domains. In: R. Hassin, K. Ochsner, Y. Trope (Eds.), *Self control in society, mind, and brain* (pp. 141–162). New York, NY: Oxford University Press.
- Cyders, M.A., Smith, G.T., Spillane, N.S., Fischer, S., Annun, A.M., Peterson, C. (2007). Integration of impulsivity and positive mood to predict risky behavior: development and validation of a measure of positive urgency. *Psychol Assess*, 19(1), 107–118.
- Dollard, J., & Miller, N.E. (1967). *Osobowość i psychoterapia*. Warszawa: PWN.
- Funder, D., & Block, J. (1989). The role of ego-control, ego-resiliency, and IQ in delay of gratification in adolescence. *Journal of Personality and Social Psychology*, 57, 1041–1050. doi: 10.1037/0022-3514.57.6.1041
- Gailliot, M.T., Baumeister, R., DeWall, C., Maner, J., Plant, E., Tice, D., Brewer, L., Schmeichel, B. (2007). Self-control relies on glucose as a limited energy source: Willpower is more than a metaphor. *Journal of Personality and Social Psychology*, 92, 325–336. doi: 10.1037/0022-3514.92.2.325
- Hoerger, M., Quirk, S.W., & Weed, N.C. (2011). Development and Validation of the Delaying Gratification Inventory. *Psychological Assessment*, 23(3), 725–738.
- Hofmann, W., Baumeister, R.F., Förster, G., & Vohs, K.D. (2012). Everyday temptations: An experience sampling study of desire, conflict, and self-control. *Journal of Personality and Social Psychology*, 102, 1318–1335. doi: 10.1037/a0026545
- International Test Commission (2005). International Guidelines on Test Adaptation. [www.intestcom.org]
- Kitayama, S., & Tompson, S. (2015). A biosocial model of affective decision making: Implications for dissonance, motivation, and culture. *Advances in Experimental Social Psychology*, 52, 71–137. http://dx.doi.org/10.1016/bs.aesp.2015.04.001
- Kline, R.B. (2016). *Principles and practice of structural equation modeling* (4th ed.). New York: Guilford Press.
- Kofta, M. (1979). *Samokontrola a emocje*. Warszawa: Państwowe Wydawnictwo Naukowe.
- Kuc, B.R. (1984). *Samokontrola. Metoda dobrej roboty*. Warszawa: Instytut Wydawniczy Związków Zawodowych.
- Lee, P., Lan, W., Wang, C., & Chiu, H. (2008). Helping young children to delay gratification. *Early Childhood Education Journal*, 35, 557–564. doi: 10.1007/s10643-008-0240-9.
- Maranges, H.M., & Baumeister, R.F. (2016). Self-control and ego depletion. In: K. Vohs & R. Baumeister (Eds.), *Handbook of self-regulation* (3rd Edn., pp. 42–61). New York: Guilford.
- Mądrzycki, T. (2002). *Osobowość jako system tworzący i realizujący plany*. Gdańsk: Wydawnictwo Uniwersytetu Gdańskiego.
- Mischel, H.N., & Mischel, W. (1983). The Development of Children's Knowledge of Self-control Strategies. *Child Development*, 54, 603–619.
- Mischel, W. (1974). Processes in Delay of Gratification. *Advances in Experimental Social Psychology* (7), 249–292.
- Mischel, W. (2015). *Test Marshmallow. O pożytkach płynących z samokontroli*. Sopot: Smak Słowa.
- Mischel, W., & Baker, N. (1975). Cognitive appraisals and transformations in delay behavior. *Journal of Personality and Social Psychology*, 31, 254–261.
- Mischel, W., & Ebbesen, E.B. (1970). Attention in Delay of Gratification. *Journal of Personality and Social Psychology* (No. 2), 329–337.
- Mori, Y., Kobayashi, T., Anpo, Y., & Ohnuma, S. (2015). The long-term effects of intrinsic motivation on household energy-saving behavior: With actual energy use and self-reported behavior. *Japanese Journal of Social Psychology*, Vol. 31 (No. 3), 160–171.
- Muraven, M., & Baumeister, R.F. (2000). Self-regulation and depletion of limited resources: does self-control resemble a muscle? *Psychological Bulletin*, 126, 247–259.

- Muraven, M., & Slessareva, E. (2003). Mechanisms of self-control failure: Motivation and limited resources. *Personality and Social Psychology Bulletin, 29*, 894–906. <http://dx.doi.org/10.1177/0146167203029007008>
- Pilarska, A., & Baumeister, R.F. (2018). Psychometric properties and correlates of the Polish version of the Self-Control Scale (SCS). *Polish Psychological Bulletin, 49*(1), 95–106.
- Ramanathan, S., & Williams, P. (2007). Immediate and delayed emotional consequences of indulgence: The moderating influence of personality type on mixed emotions. *Journal of Consumer Research, 34*, 212–223. doi: 10.1086/519149
- Reykowski, J. (1975). Emocje i motywacja. In: T. Tomaszewski (Ed.) *Psychologia*. Warszawa: PWN.
- Romer, D., Duckworth, A.L., Sznitman, S., & Park, S. (2010). Can Adolescents Learn Self-control? Delay of Gratification in the Development of Control over Risk Taking. *Prevention Science: The Official Journal of the Society for Prevention Research, 11*(3), 319–330. <http://doi.org/10.1007/s11121-010-0171-8>
- Rossee, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software, 48*(2), 1–36.
- Savani, K., & Job, V. (2017). Reverse Ego-Depletion: Acts of Self-Control Can Improve Subsequent Performance in Indian Cultural Contexts. *Journal of Personality and Social Psychology, Vol. 113* (No. 4), 589–607.
- Schmeichel, B.J., & Vohs, K. (2009). Self-affirmation and self-control: Affirming core values counteracts ego depletion. *Journal of Personality and Social Psychology, 96*, 770–782. <http://dx.doi.org/10.1037/a0014635>
- Studenski, R. (2004). *Ryzyko i ryzykowanie*. Katowice: Wydawnictwo Uniwersytetu Śląskiego.
- Tangney, J.P., Baumeister, R.F., & Boone, A.L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality, 72*, 271–322.
- Teuscher, U., & Mitchell, S.H. (2011). Relation between time perspective and delay discounting: A literature review. *Psychological Record, 61*(4), 613–632.
- The R Core Team (2017). R: A Language and Environment for Statistical Computing. [www.cran.r-project.org]
- Tice, D.M., Baumeister, R.F., Shmueli, D., & Muraven, M. (2007). Restoring the self: Positive affect helps improve self-regulation following ego depletion. *Journal of Experimental Social Psychology, 43*, 379–384. <http://dx.doi.org/10.1016/j.jesp.2006.05.007>
- Twenge, J.M., Catanese, K.R., & Baumeister, R.F. (2003). Social exclusion and the deconstructed state: Time perception, meaninglessness, lethargy, lack of emotion, and self-awareness. *Journal of Personality and Social Psychology, 85*, 409–423. doi: 10.1037/0022-3514.85.3.409
- Uziel, L., & Baumeister, R.F. (2017). The self-control irony: Desire for self-control limits exertion of self-control in demanding settings. *Personality and Social Psychology Bulletin, 43*(5), 693–705. doi: 10.1177/0146167217695555
- Wiese, C., Tay, L., Duckworth, A., D’Mello, S., Kuykendall, L., Hofmann, W., Baumeister, R., & Vohs, K. (2017). Too much of a good thing? Exploring the inverted-U relationship between self-control and happiness. *Journal of Personality*. doi: 10.1111/jopy.12322.

## Appendix A

## Supplemental Materials

Table A1. Properties of Delaying Gratification Inventory Items in Study 1

Item	<i>M</i>	<i>SD</i>	Food	Physical	Social <sup>1</sup>	Money	Achiev.	DGI-35	DGI-34
Food									
6	3.14	1.20	<b>.65</b>	.30	.13	.18	.26	<b>.44</b>	<b>.43</b>
11	2.64	1.15	<b>.60</b>	.32	.05	.22	.08 s.i.	<b>.39</b>	<b>.38</b>
16	3.02	1.17	<b>.57</b>	.24	.08	.16	.15	<b>.36</b>	.36
31	3.29	1.08	<b>.56</b>	.23	.11	.23	.18	<b>.37</b>	<b>.37</b>
21	3.76	1.26	<b>.56</b>	<b>.37</b>	.15	.27	.23	<b>.46</b>	<b>.46</b>
1	4.19	1.00	<b>.53</b>	.31	.17	.28	.23	<b>.44</b>	<b>.44</b>
26	3.50	.97	<b>.47</b>	.22	.18	.13	.25	<b>.35</b>	<b>.36</b>
Physical									
22	4.07	1.17	.14	<b>.57</b>	.29	.22	.26	<b>.40</b>	<b>.40</b>
7	4.18	.97	.13	<b>.53</b>	.31	.17	.22	<b>.35</b>	<b>.36</b>
32	2.83	1.04	.29	<b>.52</b>	.10	.22	.26	<b>.39</b>	<b>.39</b>
12	3.11	1.02	.32	<b>.51</b>	.12	.28	.14	<b>.40</b>	<b>.39</b>
27	3.17	1.12	.28	<b>.51</b>	.08 s.i.	.21	.24	<b>.38</b>	<b>.37</b>
2	3.75	.88	<b>.43</b>	<b>.47</b>	.15	.23	.20	<b>.42</b>	<b>.42</b>
17	3.54	.89	.27	<b>.46</b>	.20	.23	.29	<b>.42</b>	<b>.42</b>
Social									
23	3.88	1.02	.16	.28	<b>.81</b>	.24	.28	<b>.47</b>	<b>.47</b>
18	3.58	.89	.17	.27	<b>.76</b>	.19	.27	<b>.44</b>	<b>.44</b>
33	3.76	.98	.15	.27	<b>.75</b>	.19	.26	<b>.43</b>	<b>.43</b>
8	3.77	.85	.15	.24	<b>.71</b>	.16	.19	<b>.39</b>	<b>.39</b>
28	3.87	.74	.15	.20	<b>.62</b>	.14	.25	<b>.36</b>	<b>.36</b>
13	4.29	.76	.06 s.i.	.16	<b>.54</b>	.11	.19	.28	.28
3	2.80	1.15	.14	.13	.07 s.i.	.10	.02 s.i.	.20	.13
Money									
24	4.15	.91	.29	<b>.35</b>	.24	<b>.75</b>	.29	<b>.56</b>	<b>.56</b>
34	3.76	1.07	.23	.31	.16	<b>.72</b>	.25	<b>.48</b>	<b>.49</b>
4	3.91	1.10	.22	.23	.10	<b>.70</b>	.26	<b>.43</b>	<b>.44</b>
29	3.65	.89	.29	.32	.10	<b>.70</b>	.32	<b>.51</b>	<b>.52</b>
14	3.91	.90	.30	.32	.23	<b>.68</b>	.27	<b>.52</b>	<b>.52</b>
9	3.78	1.16	.19	.25	.14	<b>.61</b>	.13	<b>.39</b>	<b>.38</b>
19	4.24	1.03	.18	.23	.24	<b>.56</b>	.24	<b>.42</b>	<b>.42</b>

Table A1 cont.

Item	<i>M</i>	<i>SD</i>	Food	Physical	Social <sup>1</sup>	Money	Achiev.	DGI-35	DGI-34
Achievement									
10	3.52	1.05	.19	.26	.21	.22	<b>.73</b>	<b>.46</b>	<b>.47</b>
5	3.38	1.03	.18	.24	.20	.17	<b>.69</b>	<b>.42</b>	<b>.43</b>
35	3.58	1.09	.18	.31	.28	.23	<b>.63</b>	<b>.46</b>	<b>.47</b>
15	3.29	1.19	.17	.31	.20	.20	<b>.64</b>	<b>.44</b>	<b>.44</b>
25	3.46	1.11	<b>.35</b>	<b>.40</b>	.21	.33	<b>.60</b>	<b>.55</b>	<b>.55</b>
20	4.04	.86	.18	.22	.26	.25	<b>.58</b>	<b>.41</b>	<b>.42</b>
30	3.64	.87	.22	.17	.15	.20	<b>.51</b>	<b>.36</b>	<b>.37</b>

Note.  $N=1,051$ . <sup>1</sup> If item 3 has been skipped. <sup>s.1.</sup>  $p > .01$ . Correlations greater than  $r = .35$  are in bold. Item are presented in order descending item-total correlations by subscale.

Table A2. Results of confirmatory factor analysis: Factor loadings in Study 1

Item	Factor loadings				
	Food	Physical	Social	Money	Achiev.
1/ I can resist junk food when I want to [Kiedy chcę, potrafię oprzeć się jedzeniu fast foodów]	.51				
6/ I would have a hard time sticking with a special, healthy diet [Ciężko byłoby mi wytrzymać na zdrowej diecie] R	.52				
11/ If my favorite food were in front of me, I would have a difficult time waiting to eat it [Gdyby moje ulubione potrawy stały przede mną, trudno byłoby mi powstrzymać się od zjedzenia ich] R	.44				
16/ It is easy for me to resist candy and bowls of snack foods [Łatwo jest mi oprzeć się słodyczom i przekąskom]	.42				
21/ Sometimes I eat until I make myself sick [Czasami jem, aż robi mi się niedobrze] R	.53				
26/ I have always tried to eat healthy because it pays off in the long run [Przeważnie próbowałem/-am jeść zdrowo, ponieważ w dalszej perspektywie opłaca się to]	.41				
31/ Even if I am hungry, I can wait until it is meal time before eating something [Nawet, jeśli jestem głodny/- a, potrafię poczekać, aż nadejdzie pora posiłku]	.45				
2/ I am able to control my physical desires [Jestem w stanie kontrolować swoje fizyczne pragnienia]		.45			
7/ I like to get to know someone before having a physical relationship [Zanim nawiążę z kimś kontakt fizyczny, lubię go/ją najpierw poznać]		.35			
12/ My habit of focusing on what “feels good” has cost me in the long run [Na dłuższą metę mój zwyczaj dążenia do przyjemności sporo mnie kosztuje] R		.40			
17/ I have given up physical pleasure or comfort to reach my goals [Potrafię zrezygnować z fizycznej przyjemności czy komfortu by osiągać swoje cele]		.44			

Table A2 cont.

Item	Factor loadings				
	Food	Physical	Social	Money	Achiev.
22/ I prefer to explore the physical side of romantic involvements right away [Wolę pójść z kimś do łóżka jeszcze zanim zaangażuję się emocjonalnie] R		.36			
27/ When faced with a physically demanding chore, I always tried to put off doing it [Kiedy mam wykonać fizycznie wymagające, nieprzyjemne zadanie, przeważnie staram się odłożyć je na później] R		.36			
32/ I have lied or made excuses in order to go do something more pleasurable [Kłamałem/-am lub szukałem/-am wymówek po to, by zająć się czymś przyjemniejszym] R		.37			
3/ I hate having to take turns with other people [Nie znoszę czekania na swoją kolej] R <sup>1</sup>			–		
8/ Usually I try to consider how my actions affect others [Zazwyczaj staram się rozważyć, jak moje działania wpłyną na innych]			.68		
13/ I think that helping each other benefits society [Myślę, że pomaganie sobie nawzajem przynosi korzyść społeczeństwu]			.41		
18/ I try to consider how my actions will affect other people in the long-term [Staram się przewidzieć, jak z upływem czasu moje czyny wpłyną na innych ludzi]			.76		
23/ I do not consider how my behavior affects other people [Nie rozważam, jak moje zachowanie wpływa na innych ludzi] R			.73		
28/ I value the needs of other people around me [Cenię potrzeby innych ludzi]			.54		
33/ There is no point in considering how my decisions affect other people [Nie ma sensu rozmyślanie nad tym, jak moje decyzje wpływają na innych ludzi] R			.66		
4/ When I am able to, I try to save away a little money in case an emergency should arise [Kiedy jestem w stanie, staram się odłożyć trochę pieniędzy na czarną godzinę]				.60	
9/ It is hard for me to resist buying things I cannot afford [Trudno mi oprzeć się kupowaniu rzeczy, na które mnie nie stać] R				.42	
14/ I try to spend my money wisely [Próbuję wydawać pieniądze rozsądnie]				.69	
19/ I cannot be trusted with money [Jeśli chodzi o pieniądze, nie można mi ufać] R				.42	
24/ When someone gives me money, I prefer to spend it right away [Kiedy otrzymuję pieniądze, wolę je od razu wydać] R				.75	
29/ I manage my money well [Dobrze gospodaruję swoimi pieniędzmi]				.73	
34/ I enjoy spending money the moment I get it [Lubię wydawać pieniądze w momencie, gdy je dostaję] R				.64	

Item	Factor loadings				
	Food	Physical	Social	Money	Achiev.
5/ I worked hard in school to improve myself as a person [W szkole ciężko pracowałem/- am by stać się lepszą osobą]					.56
10/ I have tried to work hard in school so that I could have a better future [Staralem/-am się ciężko pracować w szkole, żeby zapewnić sobie lepszą przyszłość]					.60
15/ In school, I tried to take the easy way out [W szkole starałem/-am się iść po linii najmniejszego oporu] R					.49
20/ I am capable of working hard to get ahead in life [Jestem w stanie pracować ciężko, by zejść daleko w życiu]					.54
25/ I cannot motivate myself to accomplish long-term goals [Nie mogę zmotywować się do realizacji długoterminowych celów] R					.63
30/ I have always felt like my hard work would pay off in the end [Zawsze czułem/-am, że moja ciężka praca w końcu opłaci się]					.46
35/ I would rather take the easy road in life than get ahead [Wolałbym/-abym wybrać łatwiejszą drogę w życiu, niż wysilać się by zejść daleko] R					.56

Note.  $N=1,051$ . <sup>1</sup> Removed from the model. R – reversed items.

**Table A3. Results of confirmatory factor analysis: Covariances between factors in Study 1**

Scale	Food	Physical	Social	Money
Food	–			
Physical	.89	–		
Social	.31	.49	–	
Money	.52	.64	.23	–
Achievement	.50	.68	.42	.46

Note.  $N=1,051$ .