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MULTITASKING AMONG MODERN DIGITAL GENERATIONS Y AND Z

Abstract

The paper aimed to examine potential differences in attention and alternating capacities between two modern digital generations, i.e., Y and Z. Although these generations are described as different, generation Z is thought as multitasking, there is a lack of experimental research documenting these dissimilarities. The study involved a group of 408 participants (202 representing generation Y, and 206 representing generation Z). The experiment consisted of two parts, i.e., tasks measuring target detection attention capacities and alternating attention tasks. Surprisingly, the results showed there are no significant differences in attentional capacity between these two modern digital generations. Generation Z is not more multitasking than generation Y. The similarities between these two generations raise questions about the philosophy of the concept of generations and about scientific evidence supporting the ideas of differentiation of generations. Our results are consistent with opinions concerning heterogeneity of IT/technological capacities among modern digital generations. The cognitive capacities of both generations are similar which was explained in line with critical opinions related to the philosophy and essence of the concept of generation differentiation.

Keywords: *digital natives, philosophy of generations, attention, multitasking, generation differentiation*

Introduction

The modern digital generations named Generation Y born between 1980 and 1995 and Generation *Z* born after 1995 grew up in a world of the emerging information technologies (Tapscott, 2009). They are thought to be different as Gen Z is characterized by the need for constant Internet presence, for constant interactions with friends to follow their lives in the virtual world, and by a tendency towards multitasking (Prensky, 2001; Liu et al., 2012). Gen Z show very high skills in the use of technology. The preferred channels of activity are also different: while Gen Z uses a variety of Twitter and Instagram features, Y's are content with email and surfing the internet. Gen Z is more attached to the possibility to create their image, whereas the older ones are more reserved towards virtual reality (Arora, 2012; Linne, 2014; Venter, 2017). It is assumed that the differences between these generations result from the varied environments in which they were brought up and acquired social skills. Generation Z lives and develops in an environment of rapid technological development. Generation Y, on the other hand, had contact with such technological advancements only at the time they were approaching adulthood.

The literature suggests there are differences in the function of attention between the digital generations Y and Z. It has been indicated that the reasons for these differences may result from the fact that the latter generation learned to use digital technologies at a very young age. Some researchers attempt to design a working environment for digital natives in such a way as to attract their attention by the playfulness of the working environment. It seems that this type of need may result from being brought up in a digitized environment (Liu et al., 2012). It has been reported that Gen Z spend more time performing virtual activities, and their interpersonal communication is carried out by means of the latest technologies (Palfrey and Gasser, 2008; Prensky, 2001, 2005). It is thought that because they frequently use digital technologies, they differ in mental processing and information processing from earlier generations (Venter, 2017). Generation Z is perceived to be endowed with several specific qualities such as high flexibility, rapid attention shifting, ability of parallel processing, technological proficiency and fluent

use of the latest technologies, as well as high social awareness (Epstein and Howes, 2008; Prensky 2005; Winograd and Hais, 2011).

Current study

Based on the literature, we assume that generations Y and Z differ in terms of attention capacities we anticipated that Generation Z would achieve better scores in target detection and alternating attention tasks because of the opinion that they are good in multitasking and they are used to various electronic devices. We hypothesize that generation Z, known to more frequently use IT technology, achieve higher scores in target detection tasks and alternating attention tasks, particularly in figurative/non-verbal tasks as they used to have frequent contact with figurative/non-verbal data.

Methodology

Paricipants

The study focuses on comparisons of two groups – generation Y and Z. In total 408 respondents participated in the study; 202 individuals were classified as Generation Y, and 206 individuals were classified as Generation Z. The respondents were recruited via answeo.pl, a website specializing in acquisition of respondents. A total of 256 women and 156 men took part in the study. Generation Y group included 121 women and 81 men, whereas Generation Z group consisted of 135 women and 71 men. The average year of birth of the respondents was M = 1992.8; SD = 7.13. In Generation Y group it was M = 1986.6; SD = 4.7, while in Generation Z group M = 1998.8; SD = 2.2.

The participants reported the following level of formal education: primary (n = 8; 2%), middle school (n = 25; 6.1%), vocational (n = 26; 6.4%), general secondary school (n = 89; 21.8%), secondary vocational (n = 73; 17.9%), post-secondary (n = 38; 9.3%), bachelor's degree or equivalent (n = 71; 17.4%),

master's degree or equivalent (n = 73; 17.9%), and at least a doctoral degree (n = 4.1%).

Materials and procedure

The study comprised a procedure of testing selected aspects of attention via the Internet. Some researchers point to the successful online replication of classic cognitive experiments (Crump et al., 2013). The respondents were asked to perform cognitive tasks. For this purpose, an experimental tool for measuring selected aspects of attention was developed. A pilot study was conducted to select tasks that meet the equivalence criteria.

Target detection tasks.

The assessment consisted of four tasks. These tasks involved visual search. Two verbal tests, and two picture tests were constructed. In the verbal test, participants were asked to count specific letters (letters 'I' and 'C') in the displayed text. In the picture set, participants were asked to count all ideal models (triangles and squares) in a collection also comprising other non-ideal figures (distractors). The material shown to the study participants is included in the Appendix. A time limit (1 minute) was defined for the tasks. A similar demarcation of material is used in the RSVP paradigm (Barber, et al., 2010; Reeves, McLellan, 2020). The construction of the tasks in the first part of the tool was based on the well-optimized D2 test in terms of reliability (Steiborn et al., 2018). Reliability of the target detection measures was assessed with Guttman split-half coefficient (figures = .747, letters = .792).

Testing of alternating attention.

Before starting the test, the participants read the instructions. The task designed to assess alternating attention was developed by replicating and modifying the classical paradigm defined for exposing the subject to a stimulus situation induced with the use of two channels (visual and auditory). The study participants were asked to perform arithmetic tasks (calculate math tasks – see the Appendix) while listening to a song and counting the words ending with the letter 'O' in that song. The procedure was inspired by the SAT tool

(Foxe et al., 2012; Luck et al., 2012). Arithmetic tasks are successfully used as a measure of disturbances in some aspects of attention abilities (LeFevre et al., 2013; Masson et al., 2017). The level of difficulty in the arithmetic tasks was assessed as average by the respondents (M = 53.44; SD = 25.13). Reliability of the alternating attention tasks was assessed by Guttman split-half coefficient (math tasks = .988, letter O = .998, shifting = .997).

The piece of music that was selected was the song Pamiętam Twoje Oczy by Mieczysław Fogg (see Appendix 2A). It was selected because of the singer's clear articulation; furthermore, the song can be used freely as it is no longer subject to copyrights and it is not widely known to the relevant generations.

Other measures. At the beginning of the assessment, the participants were asked to provide information about their sex, year of birth, formal education, place of residence, as well as medications used and/or disorders that may affect the cognitive domain.

Indicators used in statistical analyses. In the target-detection tasks, the score was based on correct answers provided; these were rated by comparing the obtained result to the true result.

The experimental indicators were as follows: the total of correct answers in two verbal tasks (the total of correctly identified letters 'C' and 'I'), the total of correct answers in two non-verbal / figurative tasks (the total of correctly identified triangles and squares).

The indicators of alternating attention were: the total of correctly identified letters 'O' in the song, the total of correct results in math tasks, and the total number for attention shifts, i.e., the total of correct 'O' letters and accurate results in math tasks. We assumed that more correct letters 'O' identified and simultaneously greater number of math tasks performed accurately corresponded to a greater ability to shift attention between the two stimulus channels.

The research procedure received a positive opinion (protocol no. 6/2021) of the Research Ethics Committee at Maria Curie-Skłodowska University in Lublin.

Results

We compared the two generations Y and Z in terms of the scores in their assessment of the target detection tasks and alternating attention tasks (Table 1 presents descriptive statistics) with the use of analysis of variance.

Table 1. Descriptive statistics

Variables	*Min.*	*Max.*	*M*	*SD*	*Generation Y*	*Generation Z*
Target detection tasks						
Correct figures	2.00	4.00	2.96	.77	2.96	2.96
Correct letters	2.00	4.00	2.91	.73	2.87	2.95
Alternating attention tasks						
Correct letters O	1.00	2.00	1.13	.34	1.13	1.12
Correct math tasks	16.00	32.00	28.31	4.33	28.24	28.36
Shifting	17.00	34.00	29.44	4.33	29.38	29.49

M – means, *SD* – standard deviations

Table 2. Analysis of variance for target detection and alternating attention tasks

Tests of between-subjects effects				
Source	*Dependent Variables*	*F(1, 405)*	*p*	*η2*
Generation	Correct figures	.085	.770	.001
	Correct letters	.251	.617	.001
	Correct letters O	.434	.510	.009
	Correct math tasks	.138	.711	.003
	Shifting	.102	.750	.002

A one-way analysis of variance was conducted taking into account the main variables used in target detection tasks i.e., number of correct letters (including letters I and C), number of correct figures (including triangles and squares), and the variables used in the alternating attention tests comprising

two different tasks, i.e., the number of correct letters O, total of correct math scores, and shifting indicator (combining the total of correct letters O and correct scores in math tasks) (see Table 2). This analysis showed that dependent variables were not significantly differentiated by generation. The variable of generation did not differentiate any dependent variables. In general study participants representing both generations on average had high scores in all experimental tasks. They had very good results in target detection tasks and in alternating attention tasks. Both generations have similar scores in all attention tasks, i.e., target detection and alternating attention tasks, however they differ in self-assessment of conditions of experiment.

Conclusions

The results showed that the two generations, the older one born between 1980 and 1995 named Generation Y and the younger one born after 1995, i.e., Generation Z, are similar in terms of their attentional capacities. Generation Z, according to the related literature, lives in the environment of digital technologies; they acquire information, learn, and think in a completely different way than Generation Y (Prensky, 2005). The assumption that Gen Z is particularly good in multitasking has not been confirmed. To the contrary, members of Generations Z and Y seem to be equally able to accurately perform multiple tasks, as shown by their similar scores in the alternating attention task. Indeed, although multitasking is thought to be a quality characteristic for Z-generation, the results which are in conflict with our findings were obtained through self-assessment, i.e., members of Z-generation reported they were multitasked (Jeong and Fishbein, 2007; Carrier et al., 2009). The cognitive similarities between these two generations raise questions about the essence of the concept of *generation* and about scientific evidence supporting the differentiation of generations. In this context our results are consistent with the critical debate related to the concept of *digital native* generations, and focusing on differentiation of these generations (Bennett and Maton, 2010; Evans and Roberstson, 2020; Ophir et al., 2009; Ophir et al. 2020; Selwyn, 2009). Our findings are consistent with statements that generations are greatly heterogeneous (Bennett

et al., 2008). Research shows that young people belonging to Generation Z present an extremely large variety of IT/information technology skills, use greatly varied ways of learning or acquiring knowledge, and use a variety of networks or social networking sites (Margaryan et al., 2011). This intra-group variation is so large that some researchers even postulate that the term *digital natives* should no longer be used when referring to young people, because the phrase does not describe them at all (Koutropoulos, 2011). Young people do not always fit the definition of a given generation (Helyer and Lee, 2012). Generations Y and Z have similar attention capacities. Both generations present good attention in both target detection and alternating attention tasks. Our experiment did not confirm higher multitasking skills in net generation/Z generation compared to Y generation.

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