

THE TEST OF PROBLEMATIC USING OF THE INTERNET—ADAPTATION OF THE INSTRUMENT FOR A GROUP OF PEOPLE WITH MILD INTELLECTUAL DISABILITY AND A PRELIMINARY ANALYSIS OF ITS PSYCHOMETRIC PROPERTIES

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The aim of the presented research was to adapt the Test of Problematic Using of the Internet (TPUI) for a group of people with mild intellectual disability and offer a preliminary analysis of its psychometric properties. The TPUI is an instrument that allows the measurement of problematic Internet use. Problematic Internet use is defined as “excessive involvement in the use of certain Internet applications (mainly related to interactivity) with clear features of addictive behaviour, causing psychological, social and health problems” (Poprawa, 2011a, p. 217). The TPUI was subjected to psychometric verification in research involving 178 students with mild intellectual disability. Considering the diverse aetiology of intellectual disability, adolescents diagnosed with a genetic syndrome and adolescents with multiple disabilities were excluded from the study. Firstly, the analysis focused on descriptive statistics and distribution. Subsequently, exploratory, reliability and confirmatory analyses were applied. Finally, instrument standardisation was performed. The preliminary results lead to the conclusion that the Test of Problematic Using of the Internet is probably an instrument allowing a reliable and accurate measurement of problematic use of the Internet among adolescents with mild intellectual disability. Confirmation of these conclusions requires conducting further analyses on a sufficiently large group of students.

Keywords: adolescent; instrument adaptation; intellectual disability; problematic Internet use.

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Nowadays, the use of the Internet is an integral part of every person's life (Masłyk & Migaczewska, 2014). An increasing number of people have access to the net, and most Internet users consider it an irreplaceable tool that gives them the opportunity to establish contacts with others and to self-develop (Aboujaoude, 2017). Moreover, the Internet has become an appreciated source of information and technology that is indispensable in the educational, entertainment, professional, cultural, and commercial fields (Masłyk & Migaczewska, 2014).

Undoubtedly, the use of the Internet can bring numerous benefits to an individual (Kłak, 2020). However, when analysing them, it is impossible to ignore certain risks that their use might entail (Lange, 2021). These may take various forms: posting personal information online, making dangerous acquaintances, experiencing violence and aggression in the virtual world or contact with content that is detrimental to an individual's mental health and development (Skowroński, 2013). Using the Internet, some users might develop a condition that can be considered a mental disorder understood as "a clinically significant behavioural or psychological syndrome that is associated with present distress or significantly increased risk of suffering death, pain, disability or an important loss of freedom" (American Psychiatric Association, 2000, cited in Aboujaoude, 2017, p. 5). We should point out that this is an alarming situation, which, due to the continuous development of new technologies (Lange, 2021), requires constant monitoring and attention from the public and specialists as to the increasing risks in this area.

Adolescents with intellectual disabilities, much like their peers with typical intellectual abilities, actively engage with the Internet (Krzyżak-Szymańska, 2019). It is worth emphasizing that despite the availability of numerous publications describing their patterns of computer and Internet use (Alfredsson Ågren, 2020; Caton & Chapman, 2016; Jenaro et al., 2018; Sharabi & Margalit, 2011), there is still a noticeable lack of analyses regarding the potential risk of problematic Internet use in the group of individuals with mild intellectual disabilities. So it can be acknowledged that there is a lack of solutions in the field of "special needs media education" dedicated to these adolescents (Plichta, 2017). Considering that the Internet might pose a greater risk to adolescents with intellectual disability than to people within the intellectual norm (Hankała, 2009), it is essential to identify accurate and reliable tools to measure such a risk. The response to this situation involves the analyses conducted and described in this article, aiming to present the process of adapting the Test of Problematic Using of the Internet (Poprawa, 2011b) for a group of individuals with mild intellectual disabilities.

Problematic Internet Use Among Youth People: Scale of the Phenomenon

National analyses of problematic Internet use carried out over recent years have shown that it is diagnosed across all age groups (Public Opinion Research Centre/CBOS, 2018, 2019, 2022). To determine and specify its prevalence, an overview of selected studies will be presented. First, we will look at general statistics regarding Internet use worldwide and data showing the prevalence of this activity among different age groups in Poland. In the next step, we will describe research presenting Internet addiction or problematic internet use among adolescents.

Internet use is a very common phenomenon nowadays (Jarczyńska & Orzechowska, 2014). The growing role of the net can be evidenced by the statistics on its use in the world. According to data from Internet World Stats, as of December 31, 2021, the Internet was used by more than five billion users worldwide (Internet World Stats, 2023). In Europe, the number of users reached close to 750 million people (Internet World Stats, 2023). Furthermore, the frequency of Internet use varies across the world. This is confirmed for example by the results of a meta-analysis of 80 studies covering 31 countries from different regions of the world, which were presented in 2014 by scientists from Hong Kong (Chang & Li, 2014, as cited in Izdebski & Kotyśko, 2016, pp. 229–230). The researchers have shown that the highest indicators of Internet use are recorded in Middle-East Asia. The lowest is in the western and northern parts of Europe (Chang & Li, 2014, as cited in Izdebski & Kotyśko, 2016, p. 229).

In Poland, just as in other parts of the world, research has been conducted in recent years to assess the prevalence of Internet use (including problematic Internet use indicative of addiction) among varied age groups (CBOS, 2018, 2019, 2022). First, we present the latest data from CBOS studies (Report no. 77), *Internet Usage in 2022* (CBOS, 2022). They confirm that the number of Internet users in Poland has increased: 77% of surveyed adults declared regular online activity. This figure is higher by 4% compared to 2021. According to the report, individuals below 35, as well as those aged 35 to 44, used the Internet most frequently. In comparison to 2021 figures, the largest increase in the percentage of people going online was identified in the age groups of 45–54 years (up by 10%) and among individuals above 75 years old (up by 9%) (CBOS, 2022).

There is an earlier CBOS survey report, *Children and young people on the Internet: The usage and risks from the carers' perspective*, which provides a detailed overview of the statistics above. We can conclude that the Internet was used by 94% of the surveyed youth aged 13–15 (on average, 21 hours a week) and 91% of young people between 16 and 19 (usually 28 hours a week). Moreover, according to

the results of the analysis, 57% of parents/guardians of children and adolescents believed that adolescents spent too much time on the Internet—this number increased by 18% compared to the research conducted in 2008. It is worth noting that the opinion on Internet abuse usually (77% of responses) referred to teenagers at the age of 13–15 (CBOS, 2018).

Other significant analyses were carried out as part of the international project “EU NET ADB: Study of Internet Abuse by Youth in Poland and Europe” in cooperation with the Nobody’s Children Foundation (currently known as the Empowering Children Foundation). They showed that 1.3% of Polish youth displayed symptoms of Internet abuse. Twelve percent were at risk of abuse. In total, 13.3% of the respondents used the Internet dysfunctionally. The study’s results also allowed a conclusion that dysfunctional Internet use was observed more often in boys, older teenagers, and those whose parents had elementary education (Makaruk & Wójcik, 2012).

The results of the research described above, showing that 1.3% of adolescents exhibit symptoms of Internet abuse, have been confirmed in subsequent analyses. A similar result was obtained in 2016 in a study conducted on a group of lower secondary school students. The results confirmed that problematic use of the Internet concerns 1.5% of respondents, while 8.9% are at risk (Warzecha et al., 2016). In order to determine the prevalence of the phenomenon more precisely, another study was carried out in 2017. This time, the participants were younger students, aged 11 to 17, from four cities in Poland (Warsaw, Lublin, Wrocław, Katowice). The analysis of the results showed that in individual cities the percentage of young people showing symptoms of Internet addiction oscillated between 8.75% and 11.94%. The percentage of students at risk of the problem ranged from 0.41% to 1.19% (Warzecha, 2018). It is also worth noting that both the study conducted in 2016 and in 2017 showed that the risk of Internet addiction or problematic use of the Internet is more often observed in the group of boys and adolescents who come from smaller towns and villages (Warzecha, 2018; Warzecha et al., 2016).

The analyses described in a student survey report titled *Teenagers 3.0* are also worth noting. They revealed that in 2020, 33.6% of adolescents exhibited a high rate of problematic Internet use. A very high rate was observed in 3.2% of cases. We see a slight increase in this regard if we compare these data with the results obtained in 2018. However, it cannot be specified whether this increase is due to seasonal fluctuations or indicates a rising trend (Lange, 2021).

Concluding the considerations on the prevalence of problematic Internet use among adolescents, we can reasonably say that, so far, both in Poland and abroad, few studies on this problem have been carried out in the group of children and adolescents with intellectual disability (Krzyżak-Szymańska, 2019; Jenaro et al., 2018).

This is the case even though these students are active users of new technologies (Alfredsson Ågren, 2020; Caton & Chapman, 2016; Jenaro et al., 2018; Krzyżak-Szymańska, 2019; Plichta, 2013; Sharabi & Margalit, 2011). This is confirmed, among others, by statistics showing that only one is six students with an intellectual disability has no access to a computer, and a fifth does not use the Internet and/or a mobile phone (Plichta, 2017). In the case of 78% of respondents, the Internet ranks first among current interests (Chrzanowska, 2015). In this situation, it seems reasonable to say that an adaptation of the Test of Problematic Using of the Internet is essential.

Psychometric Analysis of the Test of Problematic Using of the Internet

The Test of Problematic Using of the Internet is a tool prepared by Ryszard Poprawa (2011b) based on the Internet Addiction Test (IAT) by Kimberly Young (1998a, 1998b). It should be noted here that the IAT was an operationalization of the diagnostic criteria for Internet addiction (later referred to as pathological Internet use). Its criteria were prepared based on the pathological gambling syndrome as described in the DSM-IV (Poprawa, 2011b). In the original version, the Internet Addiction Test consisted of 20 questions, and answers were given on a five-point scale from 0 (*not applicable*) to 5 (*always*) (Poprawa, 2011b).

The Test of Problematic Using of the Internet in the Polish adaptation by Poprawa consists of 22 questions. The respondents give answers on a six-point scale: 0 = *never*, 1 = *sporadically*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, 5 = *always* (Poprawa, 2011b). The tool makes it possible to determine the severity level of problematic Internet use (Makaruk & Wójcik, 2012). The test score is the sum of the respondents' answers to 22 questions, and the total score might range between 0 and 110. The higher the score, the more symptoms of problematic Internet use are confirmed and the stronger the addictive Internet engagement of the respondent (Poprawa, 2011b). The tool is often applied in clinical practice and in scientific research (Grzegorzewska & Cierpiałkowska, 2018).

The test has good psychometric properties. Factor analysis of this tool showed a one-factor structure, and the Cronbach's alpha test internal consistency was .935. In turn, the discriminatory power of individual items ranges from .40 to .70 (Cudo et al., 2016). It is also worth noting that the calculated split-half reliability is .95 with a split-half correlation of .91 (Grzegorzewska & Cierpiałkowska, 2018).

METHOD

Data Analysis

In the first step, the summary statistics and distribution were verified. Then, an exploratory analysis was carried out along with a reliability analysis and confirmatory analysis. The last stage of the analysis involved standardizing results and preparing standards. Statistical analyses were performed using IBM SPSS Statistics 25 and AMOS.

Participants

A group of 178 students with mild intellectual disability took part in the research. Considering the diverse aetiology of mild intellectual disability, adolescents diagnosed with a genetic syndrome and adolescents with multiple disabilities were excluded from the study. In the procedure for selecting students for the study, psychologists and educators working at the specific school assisted. Having access to the youth's documentation, they pointed out the students who met the above criteria. A written consent form was handed out to both the respondents and their parents/guardians before the start of the research.

Teenagers with mild intellectual disability who participated in the research attended special school complexes (45.5%) and special school and education centres (54.5%) in Małopolska Province. It should be noted that 52.2% of the responding adolescents were male ($n = 93$), and the average age of the students was 16 years old ($M = 16.31$, $SD = 1.69$).

Another noteworthy characteristic of the research sample is the professional situation of the students' parents/guardians. 57.9% of adolescents with mild intellectual disability declared that both parents were working, 17.4% of respondents declared only the father was professionally active and 15.2% of them indicated that only the mother was employed. The research design received a positive opinion from the Research Ethics Committee at the Faculty of Philosophy of the Jagiellonian University.

RESULTS

The Test of Problematic Using of the Internet (TPUI) (Poprawa, 2011b) is a Polish adaptation of the Internet Addiction Test (IAT) by Young (1998a, 1998b). It was standardized by Poprawa (2011b) for the general population of people between 9 and 65 years of age, divided into two groups, above and below 24 years. The aim of the completed analysis was verification of the psychometric properties of the Test of Problematic Using of the Internet on a group of young people aged 12–19 with mild intellectual disabilities. In the first step, descriptive statistics and distribution were checked. Detailed data can be found in Table 1 and Figure 1.

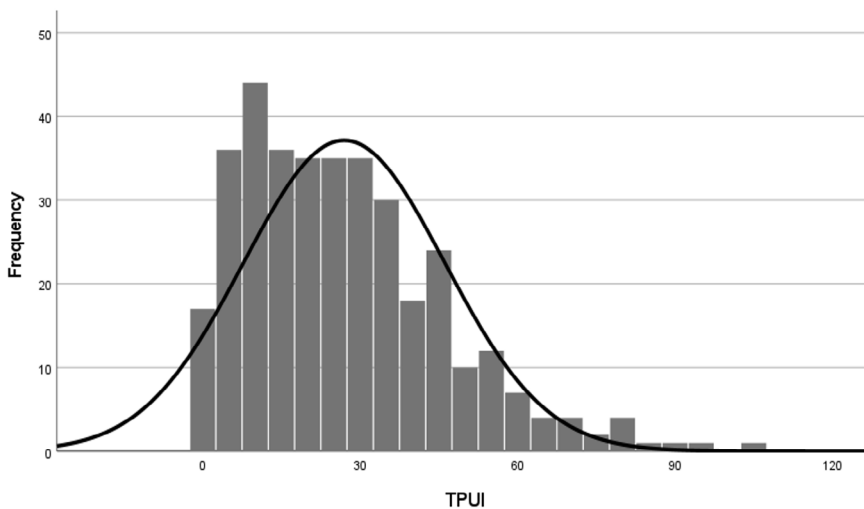
Table 1

Descriptive Statistics with Kolmogorov–Smirnov Test for the Test of Problematic Using of the Internet Among Adolescents With Mild Intellectual Disability

	<i>n</i>	<i>M</i>	<i>Me</i>	<i>SD</i>	<i>Sk.</i>	<i>Kurt.</i>	<i>Min.</i>	<i>Max.</i>	<i>D</i>	<i>p</i>
TPUI	178	31.13	28.50	22.40	0.79	0.19	0	104	0.09	0.001

Figure 1

Distribution of Results of the Test of Problematic Using of the Internet for Adolescents with Mild Intellectual Disability



The result of the Kolmogorov–Smirnov test turned out to be statistically significant, which means that the distribution significantly differed from the normal distribution. It should be added, however, that the skewness of the distribution did not exceed the conventional absolute value of 1, which means that the distribution was slightly asymmetrical. Because factor analysis was used in the original adaptation of the tool, an adequate procedure was performed to compare psychometric properties.

Exploratory Analysis and Reliability Analysis of Test of Problematic Using of the Internet

The exploratory analysis aimed to verify the one-dimensional assumption of the Test of Problematic Using of the Internet. The factors were extracted using the Catell method, based on the scree chart (Figure 2). To be more precise, all questions (factors) were located on the X-axis and their eigenvalues were located on the Y-axis. To determine the number of factors, a point representing a factor (question) was found on the chart in the place before the steepness ends, and then the number of factors above this point was calculated (Bedyńska & Cypryńska, 2013). In the case of the scree chart for the TPUI, we can conclude that it was one factor—which confirms its one-dimensionality. In turn, Table 2 contains the factor loadings of individual items, the percentage of explained variation and Cronbach’s alpha for the scale, which measures its reliability (internal consistency).

Figure 2

Scree Chart in Exploratory Factor Analysis for the Test of Problematic Using of the Internet

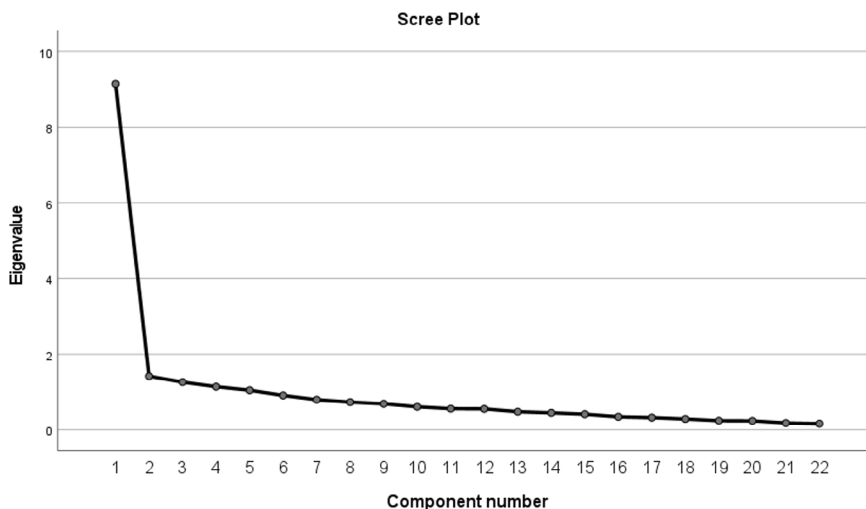


Table 2*The Results of Exploratory Factor Analysis for the Test of Problematic Using of the Internet*

	Factor loadings	Eigenvalue	% of explained variation	Cronbach's alpha
TPUI_p1	.48			
TPUI_p2	.67			
TPUI_p3	.69			
TPUI_p4	.61			
TPUI_p5	.58			
TPUI_p6	.48			
TPUI_p7	.68			
TPUI_p8	.62			
TPUI_p9	.56			
TPUI_p10	.74			
TPUI_p11	.63	9.15	41.59	.931
TPUI_p12	.73			
TPUI_p13	.67			
TPUI_p14	.76			
TPUI_p15	.67			
TPUI_p16	.62			
TPUI_p17	.62			
TPUI_p18	.56			
TPUI_p19	.67			
TPUI_p20	.67			
TPUI_p21	.68			
TPUI_p22	.70			

Based on the scree chart criterion (Figure 2), we can confirm the assumption of one-dimensionality of the Test of Problematic Using of the Internet. Another argument was the high level of Cronbach's alpha = .931 and relatively high loadings of all items (from .48 to .76) (Table 2). The values above were consistent with the data from the original tool, which was characterized by an eigenvalue of 9 and 41% of the explained variance, and item loadings ranged from .42 to .73 (Poprawa, 2011b).

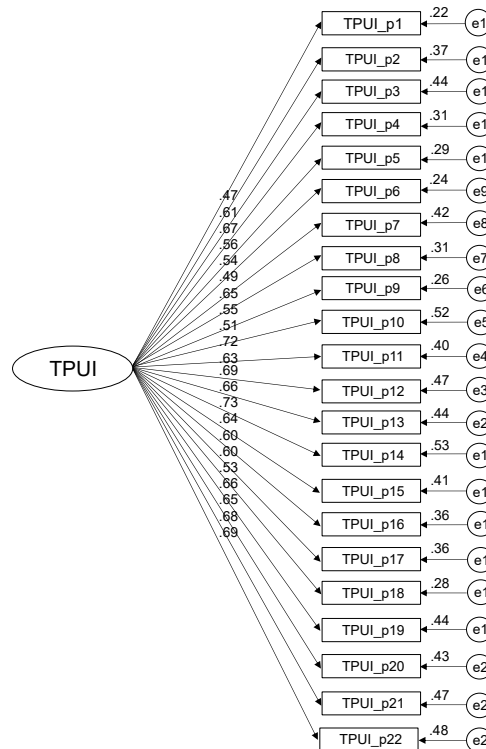
Confirmatory Analysis of the Test of Problematic Using of the Internet

The next stage was confirmatory factor analysis. The factor loadings of individual items obtained in exploratory analysis became the basis for constructing a group of items fed into the confirmatory factor analysis (CFA). The model tested in the CFA is shown in Figure 3. It should be noted that, so far, no confirmatory factor analysis of this tool has been performed, so it was not possible to compare the obtained results with the original sample.

The estimation of the model fit was based on RMSEA and CFI indicators. RMSEA shows the level of model fit to the covariance matrix, considering the number of degrees of freedom and sample size. If the RMSEA is below 0.05, the model fits the data very well—values up to 0.08 are considered acceptable. A CFI above 0.9 is considered the acceptance threshold. The indicators of the tested model were below expectations: CFI = 0.80 and RMSEA = 0.10. This level of model fit may have resulted from too small a sample (Fan & Wang, 1998).

Figure 3

Confirmatory Factor Analysis Model ($n = 178$) for the Test of Problematic Using of the Internet



Standardization of the Test of Problematic Using of the Internet

To standardize the tool to the population of adolescents with mild intellectual disability $n = 178$ ($M = 31.13$, $SD = 22.40$), raw scores of TPUI, ranging from 0 to 110, were converted to the T-score scale. This is a standard normalization scale with the largest range from 0 to 100. This scale was chosen based on the standardization of the original tool. The normalization results of the Test of Problematic Using of the Internet are presented in Table 3.

Table 3

The Norms for the Test of Problematic Using of the Internet for Adolescents With Mild Intellectual Disability

WS	T	%	WS	T	%
0	36		55–56	61	
1–3	37		57–59	62	
4–5	38	Low 17.4	60–61	63	
6–7	39		62–66	64	
8–9	40		64–65	65	High 10.70
10–12	41		66–68	66	
13–14	42		69–70	67	
15–16	43		71–72	68	
17–19	44		73–74	69	
20–21	45		75–78	70	
22–23	46		79–80	71	
24–25	47		81	72	
26–27	48		82–83	73	
28–30	49		84–86	74	
31–32	50	Average 58.9	87–89	75	
33–34	51		90–91	76	Very high 5.10
35–36	52	92–93	77		
37–38	53	94–95	78		
39–40	54		96–97	79	
42–43	55		98–99	80	
44–45	56		100–101	81	
46–47	57		102–103	82	
48–50	58		<104	83	
51–52	59				
53–54	60				

It is worth pointing out that according to the analysis 10.70% of the research sample—adolescents with mild intellectual disability—is in the risk group of problematic Internet use, and 5.10% is in the group of problematic Internet users.

DISCUSSION

The Test of Problematic Using of the Internet (TPUI) was standardized by Poprawa (2011b) for the general population. The aim of the present analysis was to examine the psychometric properties of the tool in a group of adolescents aged 12–19 with mild intellectual disabilities. To achieve this, the adaptation process of the test conducted by Poprawa (2011b) was repeated.

Factor analysis of the obtained results in both studies confirmed the single-factor structure of the tool. In Poprawa's analyses (2011b), the eigenvalue was 9.0, with the percentage of explained variance at 41%. Individual items showed factor loadings ranging from 0.40 to 0.70. Cronbach's alpha reliability coefficient was found to be .935 (Poprawa, 2011b). In our analyses, the eigenvalue was 9.15, with the percentage of explained variance at 41.6%. Individual items had factor loadings ranging from 0.48 to 0.76. Cronbach's alpha reliability coefficient was .931. These values are consistent with each other.

It should also be noted that in order to standardize the tool for a group of adolescents with mild intellectual disabilities, the standardization procedure of the original tool was followed. The raw TPUI scores, ranging from 0 to 110, were converted to a T-score scale (Poprawa, 2011b).

CONCLUSIONS

Adolescents with intellectual disabilities in terms of Internet use differ from peers with normal intellectual capacity and adolescents with other disabilities, who usually have greater autonomy (Alfredsson Ågren et al., 2020; Plichta, 2023). Therefore, it is important to analyze the functioning of this group of individuals in the virtual space in the context of their potential engagement in risky behaviours, including problematic Internet use (Plichta, 2023). To achieve this, it is necessary to identify accurate and reliable tools for diagnosis (Krzyżak-Szymańska, 2018). Having preliminary statistical analyses, we can conclude that the Test of Problematic Using of the Internet is such a tool indeed.

Preliminary psychometric analyses have confirmed satisfactory psychometric properties of the TPUI. However, further research is necessary due to the size of the adolescent group participating in the study. It is advisable to conduct psychometric work on the Test of Problematic Using of the Internet in a sufficiently large group of adolescents with mild intellectual disabilities. Carrying out such research would allow us to resolve the issue of whether this tool can be used for research and diagnostic purposes in the indicated group of adolescents.

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