

INVESTIGATION ARTICLE

Validation of the Psychological Control Scale–Youth Self-Report Indonesian version: Rasch model and factor analysis

Validación de la versión indonesia de la Escala de Control Psicológico - Autoinforme Adolescente: modelo de Rasch y análisis factorial

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Abstract

The Psychological Control Scale-Youth Self-Report (PCS-YSR) has been widely used to assess perceptions of parental psychological control across various developmental periods and countries. However, information on the psychometric properties of the PCS-YSR is limited, especially in Indonesian samples. Therefore, this study aimed to evaluate the psychometric properties of the Indonesian version of the PCS-YSR using both Rasch model and factor analysis approaches. The study employed a convenience sampling method, involving 886 adolescents aged 12-20 years. The Rasch model approach included Rasch Principal Component Analysis of Residuals, estimation of infit and outfit, person and item reliability, and differential item functioning. The factor analysis approach involved confirmatory factor analysis, Omega reliability, and measurement invariance. Results from the Rasch model approach showed that the Indonesian version of PCS-YSR only explained a unidimensional model with a variance of 38.1%, despite having acceptable infit and outfit estimates. On the other hand, results from the confirmatory factor analysis indicated satisfactory model fit for a unidimensional model, although some items had inadequate factor loadings. Moreover, items from the Indonesian version of PCS-YSR did not exhibit response bias across groups. However, the Indonesian version of PCS-YSR achieved measurement invariance only across gender and age groups, while measurement invariance across parents was not attained. These findings suggest that the Indonesian version of PCS-YSR can be used to measure adolescent perceptions of parental psychological control in Indonesian samples, given its satisfactory psychometric properties based on both Rasch model and factor analysis approaches.

Keywords: adolescence; factor analysis; psychological control; parenting; Rasch model.

Resumen

La Escala de Control Psicológico - Autoinforme Adolescente (PCS-YSR, siglas en inglés de Psychological Control Scale-Youth Self-Report) se ha utilizado ampliamente para evaluar las percepciones del control psicológico parental en diversos períodos de desarrollo y países. Sin embargo, la información sobre las propiedades psicométricas de la PCS-YSR es limitada, especialmente en muestras indonesias. Por lo tanto, este estudio tuvo como objetivo evaluar las propiedades psicométricas de la versión indonesia de la PCS-YSR utilizando tanto el enfoque del modelo Rasch como el análisis factorial. El estudio empleó un método de muestreo por conveniencia, que involucró 886 adolescentes de entre 12 y 20 años. El enfoque del modelo Rasch incluyó el Análisis de Componentes Principales de Residuos Rasch, la estimación de *infit* y *outfit*, la confiabilidad de la persona y el ítem, y la función diferencial del ítem. El enfoque del análisis factorial involucró el análisis factorial confirmatorio, la confiabilidad Omega y la invarianza de la medición. Los resultados del enfoque del modelo Rasch

mostraron que la versión indonesia del PCS-YSR solo explicó un modelo unidimensional con una varianza del 38,1%, a pesar de tener estimaciones de *infit* y *outfit* aceptables. Por otro lado, los resultados del análisis factorial confirmatorio indicaron un ajuste satisfactorio para un modelo unidimensional, aunque algunos ítems tenían cargas factoriales inadecuadas. Además, los ítems de la versión indonesia del PCS-YSR no exhibieron sesgo de respuesta entre los grupos. Sin embargo, la versión indonesia del PCS-YSR logró la invarianza de la medición solo en los grupos de género y edad, mientras que no se logró la invarianza de la medición en los padres. Estos hallazgos sugieren que la versión indonesia del PCS-YSR se puede utilizar para medir las percepciones de control psicológico parental en muestras indonesias, dadas sus propiedades psicométricas satisfactorias basadas en los enfoques del modelo Rasch y del análisis factorial.

Palabras clave: adolescentes, análisis factorial, control psicológico, crianza de los hijos, modelo Rasch.

Introduction

Parenting practices applied by parents affect a child's development. If parents apply negative parenting practices, such as psychological control, it can result in negative consequences for the child's thoughts, feelings, and behavior. Parental psychological control is commonly linked to internalizing and externalizing problems (Flamant et al., 2020; Rodríguez-Meirinhos et al., 2020; Rothenberg et al., 2020). Specifically, parents who apply parental psychological control may lead their child to experience self-criticism (Bleys et al., 2018; Gittins & Hunt, 2019), self-trouble (Chen et al., 2019), frustration (Costa et al., 2019; Soenens et al., 2018), anxiety (Darlow et al., 2017; Liga et al., 2018), depression (Chubar et al., 2020; Loeb et al., 2021; Padilla-Walker et al., 2021), and exhibit aggressive behavior (Choe & Read, 2019; Y. He et al., 2019; Nelson et al., 2013) and risky behavior (Faherty et al., 2020; Liga et al., 2018; Mabbe, Soenens, et al., 2018).

The concept of parental psychological control was initially seen as a psychological technique employed by parents to regulate a child's actions and behaviors, making the child dependent on them (Schaefer, 1965a). Barber (1996) later refined the definition of parental psychological control, which refers to the way in which parents manipulate and exploit the parent-child relationship through such means as withdrawing affection and inducing guilt, expressing negative and critical emotions (e.g., disappointment, shame), and exerting excessive personal control (e.g., possessiveness, protectiveness). Psychological and emotional control is the primary form of control utilized in parental psychological control (Barber et al., 2005).

The Psychological Control Scale-Youth Self-Report (PCS-YSR; Barber, 1996) can be used to measure parental psychological control. The PCS-YSR was originally developed by involving 16 items, some of which were taken from the Child Report of Parent Behavior Index (Schaefer, 1965b). Based on factor analysis testing, only eight items were found to group into one factor (Barber, 1996). The eight items in the PCS-YSR focus on parental control behaviors such as invalidating feelings, constraining verbal expressions, personal attack, and love withdrawal. The PCS-YSR is typically used to measure a child's perception of parental psychological control from both their father and mother separately. At the time of its development, the PCS-YSR had a reliability coefficient of 0.74 - 0.86 for father parental psychological control and 0.72 - 0.85 for mother parental psychological control (Barber, 1996).

Although the PCS-YSR has been in existence since 1996, it continues to be utilized in various countries even in the past decade. The measure is mostly employed to assess parental psychological control in countries in Europe such as the Netherlands (Mabbe, Vansteenkiste, et al., 2018; Stone et al., 2013; Werner et al., 2016), Belgium (Chubar et al., 2020; Flamant et al., 2020; Mabbe, Soenens, et al., 2018; van der Kaap-Deeder et al., 2017; Van Heel et al., 2019), Georgia (Skhirtladze et al., 2018), Italy (Costa et al., 2019; Filippello et al., 2017), and Spain (Rodríguez-Meirinhos et al., 2020) and in the Americas, including the United States (Campione-Barr et al., 2014; Cance et al., 2015; Clark et al., 2015; Cui et al., 2014), and Canada (Desjardins & Leadbeater, 2017). However, the PCS-YSR is also used in other countries such as Australia (Zimmer-Gembeck et al., 2011), Cyprus (Fousiani et al., 2016), Palestine (El-Khodary & Samara, 2019), and China (Lin et al., 2020; Tian et al., 2019). In general, the PCS-YSR is utilized to gauge individuals' perceptions of parental psychological control during childhood (de Haan et al., 2013; Kuppens et al., 2009; Miller, 2012; Salafia et al., 2009), adolescence (Batanova & Loukas, 2014; Brenning

et al., 2019; Missotten et al., 2018; Steeger & Gondoli, 2013), and emerging adulthood (Costa et al., 2016; Faherty et al., 2020; Little & Seay, 2014; Padilla-Walker et al., 2021).

The use of PCS-YSR as a tool for measuring parental psychological control is supported by strong psychometric properties. Kearney and Bussey (2015) found that the unidimensional model of PCS-YSR showed acceptable model accuracy when tested through confirmatory factor analysis on adolescent participants. Additionally, other researchers in different countries have reported that PCS-YSR is a reliable measurement instrument, with Alpha reliability coefficients ranging from 0.68 to 0.87 for measuring psychological control by fathers and from 0.69 to 0.89 for measuring psychological control by mothers (Baumgardner & Boyatzis, 2018; Filippello et al., 2018; Miller, 2012; Padilla-Walker et al., 2014; Romm et al., 2019).

Despite the widespread use of the PCS-YSR in various countries and its demonstrated psychometric properties, the knowledge about the psychometric properties of the PCS-YSR in Indonesia remains limited. Currently, there is only one study that has reported the Alpha reliability of the PCS-YSR, with values of 0.750 for father psychological control and 0.781 for mother psychological control (Intyas & Muttaqin, 2022). This limited information highlights the need for further research to assess the validity of the PCS-YSR in the Indonesian context. Additionally, Indonesia is characterized by a collective culture with a high power distance index (Hofstede et al., 2010), which can result in more dominant parenting behaviors and the imposition of strict rules by parents who hold more power (Sarwono, 2013).

Assessing the psychometric properties of a measuring instrument can be done through various methods, including the Rasch model and factor analysis. Both approaches can be used to assess the internal structure of the instrument (Demars, 2013; Osteen, 2010). The Rasch model offers more in-depth information at the item level, while factor analysis provides information on the dimensionalities and factor loadings of the instrument. Additionally, the Rasch model provides a comprehensive evaluation of psychometric properties across samples and items (Fox & Jones, 1998) and is not dependent on the sample (Tennant et al., 2004). Although there are theoretical, philosophical, and conceptual differences between the Rasch model and factor analysis (Andrich, 2004), using both methods can provide a comprehensive assessment of the psychometric properties of the instrument (Christensen et al., 2012; Waugh & Chapman, 2005). Some researchers have even combined both approaches in their psychometric property assessments (Finbråten et al., 2018; He et al., 2021; Pichardo et al., 2018; Pilatti et al., 2015; Sen & Gocen, 2021).

Actually, internal structure testing is not only limited to dimensionalities of the measuring instrument, but also related to measurement invariance. Furthermore, to date, there is no information available regarding the measurement invariance of the PCS-YSR. However, measurement invariance is considered as one source of evidence for validity based on internal structure, in addition to factor structure and internal consistency (Rios & Wells, 2014). Information about measurement invariance is useful to ensure that there is no potential bias between groups such as gender and age groups (Chen, 2008; Cheung & Rensvold, 2002). Although the term measurement invariance is primarily associated with factor analysis, the Rasch model analysis can also provide information on differential item functioning (DIF) (Wright, 1996). DIF provides information on response differences between groups on each corresponding item, similar to measurement invariance (Millsap & Olivera-Aguilar, 2012).

This study aims to assess the psychometric characteristics of the Indonesian version of the PCS-YSR through the use of the Rasch model and factor analysis methods. In the Rasch model approach, the analyses applied to evaluate the psychometric characteristics of the Indonesian version of the PCS-YSR include unidimensionality, person and item reliability, and differential item functioning (DIF) analysis. Meanwhile, the assessment of the psychometric characteristics of the Indonesian version of the PCS-YSR using the factor analysis approach will involve examining the factor structure, construct reliability, and measurement invariance across parents, gender, and age groups.

Method

Participants

The participants in this study were 886 adolescents aged 12–20 years old ($M = 16.705$, $SD = 2.388$), including 489 females (55.2%) and 397 males (44.8%) who were enrolled in schools in Surabaya City. The study further broke down the participants into three age groups: 281 early adolescents (31.7%) aged 12–15 years old ($M = 13.799$, $SD = 0.789$), consisting of 152 females (54.1%) and 129 males (45.9%); 291 middle adolescents (32.7%) aged 15–18 years old ($M = 16.738$, $SD = 0.875$), consisting of 160 females (55.0%) and 131 males (45.0%); and 314 late adolescents (35.4%) aged 18–20 years old ($M = 19.276$, $SD = 0.803$), consisting of 177 females (56.4%) and 137 males (43.6%). The majority of the participants lived with both biological parents (93.9%) and some lived with a stepmother or stepfather (6.1%). Most of the parents had either a high school education or a bachelor's degree, with 36.6% and 34.9% of the fathers and 38.1% and 36.9% of the mothers having achieved those levels of education, respectively. The fathers of the participants primarily worked as entrepreneurs (40.4%) and employees (27.0%), while the mothers mostly worked as housewives (44.6%), entrepreneurs (22.7%), or employees (16.8%).

This study employed a convenience sampling approach by distributing information about the study on social media platforms during data collection. The study established the criteria for participants to be adolescent females and males, aged 12 to 20 years, who lived with both biological or stepparents and were currently studying in Surabaya City. Participants who met these criteria and agreed to take part in the study voluntarily declared their participation through the informed consent form. All procedures used in this study were performed according to the Helsinki Declaration of 1964 and its amendments, or according to relevant ethical standards.

Measurement

Psychological Control Scale–Youth Self-Report (PCS-YSR; Barber, 1996; Barber et al., 2012). Consisting of 8 items were used to measure the parental psychological control. A similar item statement was used to measure both fathers' and mothers' parental psychological control (for example, “My father brings up past mistakes when he criticizes me”, “My mother will avoid looking at me when I have disappointed her.”). The PCS-YSR response used three options ranging from 1 (not likely) to 3 (very likely) and was translated to Indonesian using forward translation which involves two translators.

Data analysis

The psychometric properties of the Indonesian version of the PCS-YSR were evaluated using a sample of 1772 data from 886 adolescents, representing both mothers and fathers, collected for the purpose of measuring parental psychological control. The analysis of the data involved two steps: a Rasch model test and a factor analysis test. The Winsteps 5.0.1 program was used to conduct the Rasch model test, which included an assessment of the unidimensionality of parental psychological control using the Rasch Principal Component Analysis of Residuals (PCAR). According to Linacre (2006), a good unidimensional measure is indicated by a proportion of variance explained by the measure of $\geq 40\%$, while a variance explained by the measure of $\geq 30\%$ is considered good, and acceptable if $\geq 20\%$ (Smith, 2012). The unidimensionality of the measure was also assessed by examining the percentage of variance not explained by the first factor and the eigenvalue of the first factor, with a variance not explained by the first factor less than 15% and an eigenvalue of the first factor less than 3.0 being indicative of a unidimensional measure (Linacre, 2006). Additionally, the accuracy of the item measuring the unidimensional construct was evaluated using infit and outfit estimates between 0.7 and 1.3 (Bond & Fox, 2013; Wright & Linacre, 1994). The reliability and separation of the measure for both persons and items was reported, with a person reliability coefficient greater than 0.8 and an item reliability greater than 0.9 indicating consistency in respondent answers and consistency among items, respectively. A person separation index greater than 2 indicates that the measure can distinguish person abilities, while a person separation index greater than 3 indicates a hierarchical item difficulty level (Linacre, 2014). Lastly, the DIF test was used to assess

differences between groups, based on the DIF contrast and significance (Tristán, 2006). The results of the DIF test were categorized as negligible ($DIF < 0.43$ logits), slight to moderate ($DIF \geq 0.43$ logits), and moderate to large ($DIF \geq 0.64$ logits) (Linacre, 2017).

The test of the factor analysis approach was carried out using the IBM SPSS Amos 21 software. The confirmatory factor analysis was applied to the single-dimensional measurement model of parental psychological control. The accuracy of the measurement model was evaluated using several fit indices, including the Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). If the values of GFI, AGFI, CFI, and TLI are greater than 0.9 and those of RMSEA and SMRS are less than 0.08, the measurement model can be considered to have a satisfactory fit (Kline, 2014; Schreiber et al., 2006; van de Schoot et al., 2012). The internal consistency of the measurement model was assessed using Omega reliability, where a reliability coefficient of greater than 0.7 was required (Hair et al., 2014). Furthermore, multi-group analysis was employed to evaluate the measurement invariance across parent status, gender, and age groups. If the difference in CFI coefficients is less than -0.010 and the difference in RMSEA coefficients is less than 0.015, the measurement model can be said to have measurement invariance (Chen, 2007).

Results

The results of the PCAR analysis (Table 1) show that the measure accounted for 38.1% of the variance. Additionally, the variance explained by the items was higher than the variance explained by the first contrast. The variance not accounted for by the first contrast was 12.6%, and the eigenvalue of the first contrast was 1.632. These findings suggest that the Indonesian version of the PCS-YSR may be unidimensional, as it has a proportion of variance explained greater than 30%, a variance not accounted for by the first contrast of less than 15%, and an eigenvalue of the first contrast less than 3.0.

Table 1. Standardized residual variance of the Indonesian version of the PCS-YSR.

	Eigenvalues	Observed (%)
Total raw variance	12.924	100.0
Raw variance explained by measures	4.924	38.1
Raw variance explained by persons	2.242	17.3
Raw variance explained by items	2.682	20.8
Raw unexplained variance (total)	8.000	61.9
Raw variance unexplained in 1st contrast	1.632	12.6

The Indonesian version of the PCS-YSR has infit coefficients in the range of 0.86 to 1.10 and outfit coefficients in the range of 0.81 to 1.25, as shown in Table 2. These results satisfy the criteria for infit and outfit coefficients, which should be between 0.7 and 1.3, indicating that the items accurately measure the unidimensional construct. It was also found that the items of the Indonesian version of the PCS-YSR have item difficulties ranging from -1.09 to 0.78. The Indonesian version of the PCS-YSR has an item reliability coefficient of 0.99, but only a person reliability coefficient of 0.64. The person separation index is 1.34 and the item separation index is 12.61, suggesting that the Indonesian version of the PCS-YSR meets the criteria for item reliability and separation but not for person reliability and separation. The Wright Map (Figure 1) illustrates the distribution of person abilities and item difficulties in the Indonesian version of the PCS-YSR. The Indonesian version of the PCS-YSR is capable of identifying low parental psychological control, but with varying item difficulties. Finally, on the basis of the DIF tests, it has been found that the items from the Indonesian version of the PCS-YSR do not show any differences in the responses between the groups of parents, gender (Table 3), and age (Table 4).

Table 2. Measure, infit, and outfit estimation of the Indonesian version of the PCS-YSR.

Item	Measure	Infit	Outfit
1. <i>Selalu berusaha mengubah apa yang saya rasakan atau pikirkan mengenai berbagai hal</i> Is always trying to change how I feel or think about things	-1.09	1.10	1.25
2. <i>Mengubah topik pembicaraan setiap saya ingin mengatakan sesuatu</i> Changes the subject whenever I have something to say	0.30	1.07	1.01
3. <i>Sering mengganggu saya</i> Often interrupts me	0.51	1.03	1.07
4. <i>Menyalahkan saya terhadap masalah anggota keluarga lain</i> Blames me for other family members' problems	0.78	0.88	0.81
5. <i>Mengungkit kesalahan masa lalu saat orang tua saya mengkritik saya</i> Brings up past mistakes when s/he criticizes me	-0.01	1.01	0.98
6. <i>Kurang bersahabat dengan saya jika saya tidak melihat segala sesuatu sesuai dengan dirinya</i> Is less friendly with me if I do not see things her/his way	0.00	0.86	0.81
7. <i>Menghindari menatapku ketika saya telah mengecewakannya</i> Will avoid looking at me when I have disappointed her/him	-0.03	1.08	1.02
8. <i>Jika saya telah melukai perasaannya, berhenti berbicara kepada saya sampai saya menyenangkannya lagi</i> If I have hurt her/his feelings, stops talking to me until I please her/him again	-0.46	1.00	0.96

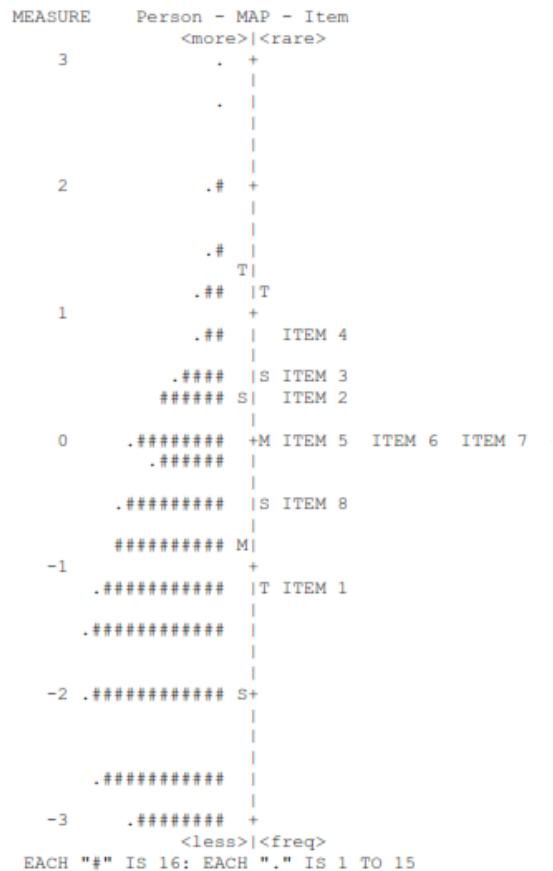


Figure 1. The Wright Map of the Indonesian version of the PCS-YSR.

Table 3. Differential item functioning across parent status and gender of the Indonesian version of the PCS-YSR.

	Father vs mother			Male vs female		
	ΔDIF	p	CUMLOR	ΔDIF	p	CUMLOR
Item 1	0.07	0.371	0.14	-0.10	0.186	-0.10
Item 2	0.00	1.000	-0.01	-0.32	0.001	-0.38
Item 3	-0.33	0.001	-0.39	0.05	0.544	0.08
Item 4	0.10	0.286	0.11	0.09	0.366	0.07
Item 5	0.35	0.000	0.44	0.07	0.403	0.05
Item 6	-0.27	0.001	-0.45	0.08	0.342	0.08
Item 7	-0.05	0.548	-0.08	0.13	0.117	0.17
Item 8	0.11	0.151	0.14	0.00	1.000	0.05

Table 4. Differential item functioning across age groups of the Indonesian version of the PCS-YSR.

	Early vs middle adolescent			Early vs late adolescent			Middle vs late adolescent		
	ΔDIF	p	CUMLOR	ΔDIF	p	CUMLOR	ΔDIF	p	CUMLOR
Item 1	-0.20	0.036	-0.23	-0.20	0.035	-0.21	0.00	0.980	0.04
Item 2	-0.11	0.313	-0.14	-0.20	0.058	-0.26	-0.09	0.379	-0.13
Item 3	-0.16	0.149	-0.21	-0.15	0.172	-0.16	0.01	0.911	0.03
Item 4	-0.05	0.691	-0.03	0.05	0.650	0.07	0.10	0.385	0.10
Item 5	0.06	0.573	0.07	0.12	0.225	0.15	0.06	0.518	0.10
Item 6	0.07	0.501	0.08	0.30	0.003	0.44	0.23	0.022	0.33
Item 7	0.20	0.049	0.24	0.05	0.636	0.05	-0.15	0.120	-0.21
Item 8	0.17	0.090	0.21	0.02	0.855	0.03	-0.15	0.118	-0.19

Table 5 shows the model accuracy index from the Indonesian version of PCS-YCR. Initially, the unidimensional model from the Indonesian version of PCS-YSR had a less accurate model fit to the data. However, after modifying the model by correlating the measurement error between items 7 and 8, the unidimensional model had a satisfactory model fit with factor loadings of 0.392 to 0.697. The correlation of measurement error between items 7 and 8 was based on the modification index suggestion and similarity of item content. The unidimensional model also had a satisfactory model fit when tested on data from fathers, mothers, males, females, early adolescents, middle adolescents, and late adolescents separately. In addition, the measurement model from the Indonesian version of PCS-YCR has an Omega reliability coefficient greater than 0.7 both in the overall data and in each separate data for parents, gender, and age.

Table 5. Model fit and composite reliability of the Indonesian version of the PCS-YSR.

	Model fit indices									ω
	χ ²	df	χ ² /df	GFI	AGFI	TLI	CFI	RMSEA	SRMR	
Total sample (1)	415.292	20	20.765	0.944	0.899	0.817	0.869	0.106	0.058	0.778
Total sample (2)	134.588	19	7.084	0.981	0.965	0.944	0.962	0.059	0.034	0.770
Fathers	62.657	19	3.298	0.982	0.966	0.952	0.967	0.051	0.035	0.749
Mothers	94.180	19	4.957	0.975	0.952	0.934	0.955	0.067	0.038	0.788
Males	87.162	19	4.587	0.973	0.949	0.928	0.951	0.067	0.041	0.772
Females	69.819	19	3.675	0.983	0.968	0.954	0.969	0.052	0.033	0.768

Early adolescent	61.479	19	3.236	0.975	0.953	0.937	0.957	0.063	0.040	0.771
Middle adolescent	64.686	19	3.405	0.974	0.952	0.926	0.950	0.064	0.041	0.756
Late adolescent	57.679	19	3.036	0.977	0.957	0.949	0.965	0.057	0.036	0.782

The results of the multi-group analysis (Table 6) showed that the Indonesian version of PCS-YSR did not demonstrate measurement invariance across parents. The scalar test revealed that the difference in CFI coefficient was larger than -0.010, despite the difference in RMSEA coefficient being less than 0.015. On the other hand, the Indonesian version of PCS-YSR demonstrated measurement invariance for gender and age as the difference in CFI coefficient was less than -0.010 and the difference in RMSEA coefficient was less than 0.015 in both the metric and scalar invariance tests.

Table 6. Measurement invariance of the Indonesian version of the PCS-YSR.

	Model fit indices				Model comparison		
	χ^2	df	χ^2	CFI	RMSEA	Δ CFI	Δ RMSEA
Measurement invariance across parents							
1. Configural invariance	156.836	38	4.127	0.961	0.042		
2. Metric invariance (compared to 1)	165.439	45	3.676	0.960	0.039	-0.001	-0.003
3. Scalar invariance (compared to 2)	217.564	53	4.105	0.946	0.042	-0.014	-0.003
Measurement invariance across gender							
1. Configural invariance	156.985	38	4.131	0.961	0.042		
2. Metric invariance (compared to 1)	162.788	45	3.618	0.961	0.038	0.000	-0.004
3. Scalar invariance (compared to 2)	181.564	53	3.426	0.957	0.037	-0.004	-0.001
Measurement invariance across age groups							
1. Configural invariance	183.845	57	3.225	0.958	0.035		
2. Metric invariance (compared to 1)	190.476	71	2.683	0.96	0.031	0.002	-0.004
3. Scalar invariance (compared to 2)	215.706	87	2.479	0.957	0.029	-0.003	-0.002

Discussion

The evaluation of the psychometric properties of the Indonesian version of the PCS-YSR was performed using both the Rasch model and factor analysis approaches. The results from the Rasch model test indicated that the Indonesian version of the PCS-YSR measures a sound unidimensional construct. The results from the confirmatory factor analysis were consistent and found the Indonesian version of the PCS-YSR to have a satisfactory unidimensional model fit. Despite this, the Indonesian version of the PCS-YSR showed low person reliability, although item and Omega reliability were found to be high. Finally, the DIF test found no evidence of bias between parent, gender, and age groups. However, the Indonesian version of the PCS-YSR only fulfilled measurement invariance between gender and age groups, while measurement invariance between parents was not achieved.

The findings regarding the unidimensional model of the Indonesian version of the PCS-YSR support previous research conducted by Kearney and Bussey (2015) and the measurement tool conceptualization by Barber (1996). Additionally, previous studies (Baumgardner & Boyatzis, 2018; Filippello et al., 2018; Miller, 2012; Padilla-Walker et al., 2014; Romm et al., 2019) also found satisfactory reliability for the PCS-YSR, as found in this study. However, the findings regarding measurement invariance and the Rasch model approach analysis are novel in terms of the psychometric properties of the PCS-YSR. This is because the majority of previous studies only reported the Alpha reliability of the PCS-YSR.

The factor structure of the Indonesian version of the PCS-YSR is indeed robust and consistent with a unidimensional model. This was confirmed through the results of the confirmatory factor analysis, which found that the PCS-YSR has a satisfactory level of unidimensional model accuracy. The robustness of the PCS-YSR's factor structure is further supported by the good infit and outfit estimates obtained from the Rasch model test, which indicate that the items in the PCS-YSR accurately measure the unidimensional construct (Bond & Fox, 2013; Linacre, 2002). However, the Indonesian version of the PCS-YSR only explains a variance of no more than 40%, indicating that there is still a significant amount of variance that cannot be explained by the Indonesian version of the PCS-YSR when used to measure parental psychological control. Additionally, some items in the Indonesian version of the PCS-YSR have factor loadings less than 0.5, suggesting that some items are not as effective in measuring their latent variables.

The low proportion of explained variance and factor loadings of some items in the PCS-YSR may be attributed to the variations in the content of the items. Specifically, the PCS-YSR consists of four different content variations: invalidating feelings (item 1), limiting verbal expressions (items 2-3), personal attacks (items 4-5), and love withdrawal (items 6-8) (Barber, 1996). The differences in content among the items may also contribute to the low person reliability, as individuals may respond differently across different content items. This implies that the PCS-YSR is a formative measurement model, meaning that the items cannot be interchangeable (Coltman et al., 2008). One possible solution is to treat the PCS-YSR as a measurement model with four distinct factors, but this cannot be achieved at present due to the limited number of items per factor. In fact, some researchers have recommended a minimum of three items per factor (Brown, 2006; Markus & Borsboom, 2013). Thus, to test the PCS-YSR as a measurement model with four factors, it would be necessary to add new items that reflect the behavior indicators of each factor.

The unidimensional model can still be considered the best model for the Indonesian version of PCS-YSR, but there are some important points to note regarding its items. First, the accuracy of the unidimensional model was achieved by measuring the error correlation between items 7 and 8. These items, "Will avoid looking at me when I have disappointed her/him" and "If I have hurt her/his feelings, stops talking to me until I please her/him again," share similarities in terms of their content. Both indicate a form of love withdrawal, which is an unhappy expression from parents (Barber, 1996). Second, item 1, "Is always trying to change how I feel or think about things," is the item that is easiest to agree with, while item 4, "Blames me for other family members' problems," is the most difficult to agree with. This suggests that changing a child's feelings or thoughts is a form of psychological control that parents often use, while blaming a child for family problems is a form of psychological control that parents use less frequently.

The items in the Indonesian version of PCS-YSR did not show any differences in response between groups, including parents, gender, and age groups. However, regarding measurement invariance, the Indonesian version of PCS-YSR only satisfies gender and age group measurement invariance, whereas there is an identified response bias between parents. This is a common occurrence due to differences in the meaning of parental psychological control between fathers and mothers, especially in Indonesia where fathers and mothers have different roles in the family. Typically, fathers in Indonesia make final decisions in the family, while mothers are responsible for maintaining family harmony (Handayani & Abdillah, 2019; Sarwono, 2013). The division of roles between fathers and mothers can lead to differences in child-rearing practices, particularly in the application of parental psychological control. Although there are differences in response related to parental psychological control practices between fathers and mothers in terms of measurement invariance, no specific items were found to be the source of response differences based on DIF testing.

This study reveals that the Rasch model approach and factor analysis, despite having different philosophical backgrounds, can complement each other in their results. Both approaches can be utilized to identify similar aspects yet provide distinct information. For instance, CFA gives insight into the validity of the tested factor structure, whereas PCAR can reveal the proportion of variance explained by the measure, as well as its dimensionality. Furthermore, both DIF and measurement invariance aim to identify differences in responses

between groups, but their focus of analysis differs. DIF provides a more item-specific analysis, while measurement invariance offers an overall view of response differences between groups. In the event that measurement invariance is found to be lacking, the DIF information can be utilized to identify items that may elicit diverse responses across groups.

This study adds to the existing knowledge on the psychometric properties of the PCS-YSR, which was previously studied in other research. In addition to providing information on measurement invariance based on factor analysis, this study also offers information on the psychometric properties of PCS-YSR through the Rasch model approach. The results of the Rasch model and factor analysis tests suggest that the Indonesian version of PCS-YSR can be used to assess adolescents' perceptions of parental psychological control in the Indonesian sample. However, there are some limitations to this study that future researchers should take into account. Firstly, the translation of PCS-YSR into Indonesian was done through forward translation, which may not be as reliable in terms of ensuring the equivalence of meaning between the original and Indonesian versions compared to the back-translation method. Secondly, this study only involved adolescent participants, so the findings may not be applicable to different developmental stages. Moreover, the use of PCS-YSR is not limited to adolescents, as it can also be used to measure children's and emerging adults' perceptions of parental psychological control.

Conclusion

The conclusion of this study is that the Indonesian version of the PCS-YSR has satisfactory psychometric properties based on both the Rasch model and factor analysis approaches. Although the Rasch model approach and factor analysis provide different information, they together provide a more comprehensive understanding of the psychometric properties. The Indonesian version of PCS-YSR can be used to measure adolescent perceptions of parental psychological control. Moreover, the Indonesian version of PCS-YSR is not affected by response bias due to group differences, including between parents, gender, and age groups.

Disclosure Statement

The authors report there are no competing interests to declare.

Informed Consent

All procedures were in accordance with the ethical standard of the responsible committee on human experimentation (national and institutional). Informed consent was obtained from all individual subjects participating in the current study.

Animal Rights

No animal was used in the current studies.

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Validación de la versión indonesia de la Escala de control psicológico - autoinforme adolescente: modelo de Rasch y análisis factorial

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Palabras clave: adolescentes, análisis factorial, control psicológico, crianza de los hijos, modelo Rasch

RESUMEN

La Escala de Control Psicológico - Autoinforme Adolescente (PCS-YSR, siglas en inglés de Psychological Control Scale-Youth Self-Report) se ha utilizado ampliamente para evaluar las percepciones del control psicológico parental en diversos períodos de desarrollo y países. Sin embargo, la información sobre las propiedades psicométricas de la PCS-YSR es limitada, especialmente en muestras indonesias. Por lo tanto, este estudio tuvo como objetivo evaluar las propiedades psicométricas de la versión indonesia de la PCS-YSR utilizando tanto el enfoque del modelo Rasch como el análisis factorial. El estudio empleó un método de muestreo por conveniencia, que involucró 886 adolescentes de entre 12 y 20 años. El enfoque del modelo Rasch incluyó el Análisis de Componentes Principales de Residuos Rasch, la estimación de *infit* y *outfit*, la confiabilidad de la persona y el ítem, y la función diferencial del ítem. El enfoque del análisis factorial involucró el análisis factorial confirmatorio, la confiabilidad Omega y la invarianza de la

medición. Los resultados del enfoque del modelo Rasch mostraron que la versión indonesia del PCS-YSR solo explicó un modelo unidimensional con una varianza del 38,1%, a pesar de tener estimaciones de *infit* y *outfit* aceptables. Por otro lado, los resultados del análisis factorial confirmatorio indicaron un ajuste satisfactorio para un modelo unidimensional, aunque algunos ítems tenían cargas factoriales inadecuadas. Además, los ítems de la versión indonesia del PCS-YSR no exhibieron sesgo de respuesta entre los grupos. Sin embargo, la versión indonesia del PCS-YSR logró la invarianza de la medición solo en los grupos de género y edad, mientras que no se logró la invarianza de la medición en los padres. Estos hallazgos sugieren que la versión indonesia del PCS-YSR se puede utilizar para medir las percepciones de control psicológico parental en muestras indonesias, dadas sus propiedades psicométricas satisfactorias basadas en los enfoques del modelo Rasch y del análisis factorial.

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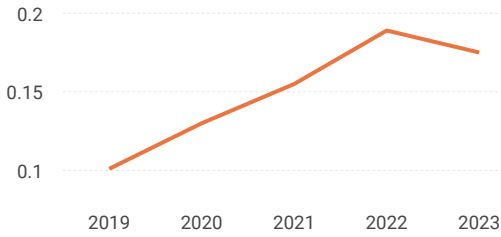
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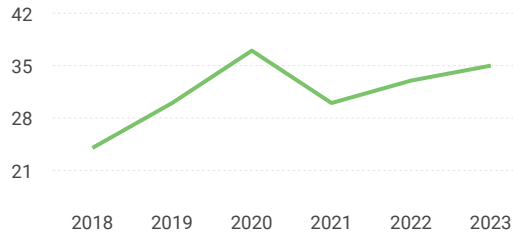
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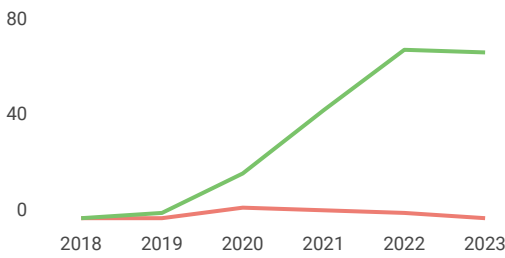
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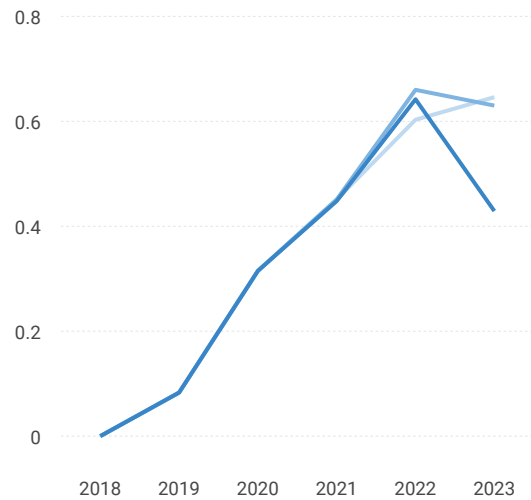
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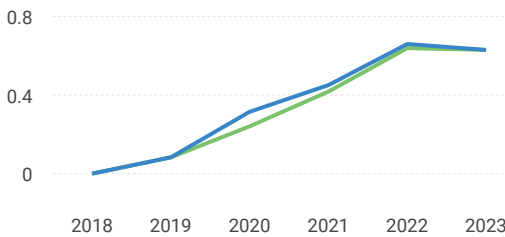
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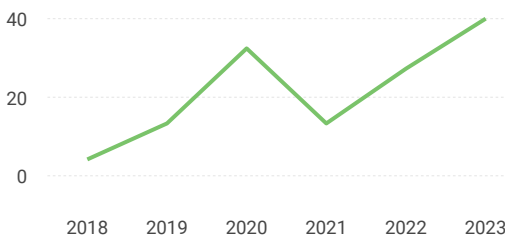
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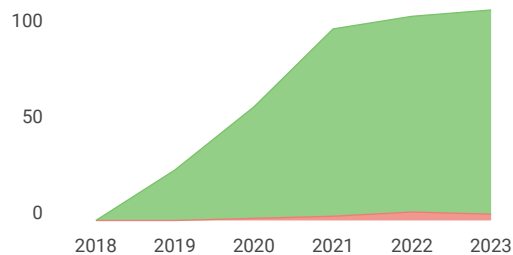
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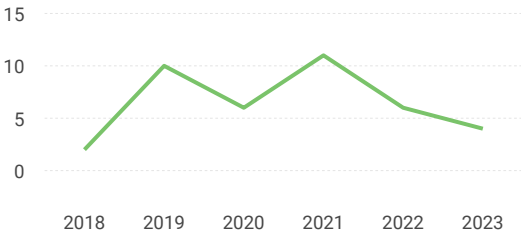
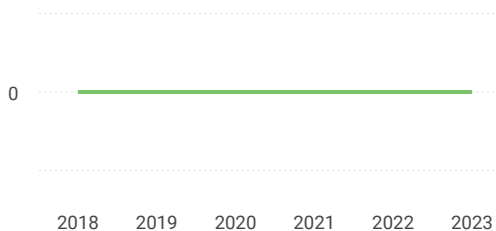


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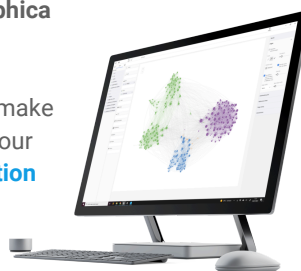
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