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FACTORIAL STRUCTURE AND VALIDITY  
OF THE SHORT VERSION  
OF THE AUTHENTIC LEADERSHIP QUESTIONNAIRE  
IN POLISH SAMPLES

The concept of authentic leadership refers to high ethical standards, sincerity and open communication in organizations. The aim of the presented paper was to test factorial structure and validity of the Authentic Leadership Questionnaire (ALQ). Two studies were conducted on two Polish samples: longitudinal Study 1 on a sample of employees of different professions and cross-sectional Study 2 on nurses. Four alternative models were tested with the use of confirmatory factor analysis. The four-factor model based on the short 13-items version of the ALQ was revealed to fit the data best. The four ALQ dimensions: leader self-awareness, relational transparency, internalized moral perspective and balanced processing were confirmed in both samples. Analysis of relationships between authentic leadership, job satisfaction, organizational commitment, turnover intention and burnout in followers confirmed concurrent and predictive validity of the short version of the measure.

**Keywords:** authentic leadership; job satisfaction; organizational commitment; turnover intention; burnout; confirmatory factor analysis; concurrent validity; predictive validity.

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## INTRODUCTION

Surveys show that 50% of corporate managers fail in doing their job (Van Vugt, Hogan, & Kaiser, 2008). The reason why it happens can be that they are required to demonstrate leadership competencies which may have little to do with their practical knowledge. These competencies are needed for increasing effectiveness in subordinates and inspiring them to exceed, which is one of leadership's main goals (Tonkin, 2013). Many existing leadership theories propose different types of behaviors which are supposed to be fruitful in managing teams. One of them is the authentic leadership theory, which, according to its authors, was developed to comprise the best qualities of different leadership conducts which include characteristics of transformational, ethical and charismatic leaders (Avolio & Gardner, 2005).

A growing number of studies on authentic leadership has shown its links to a variety of positive outcomes in employees and organizations (Gardner, Cogliser, Davis, & Dickens, 2011). Such studies were possible thanks to the development of the Authentic Leadership Questionnaire (ALQ; Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008). Establishing the validity of this measure is, however, still in progress. Moreover, some of the previous studies confirmed the postulated four-factor structure (Walumbwa et al., 2008), while others failed to confirm the factorial structure of full 16-item ALQ version due to low factor loadings of some items (Moriano, Molero, & Lévy Mangin, 2011). This raises the question of shortening the measure as well as verifying the factorial structure and psychometric properties of ALQ in different national samples. The presented research answers this call. In the article, we propose a shortened version of the ALQ Multi-Rater Form, which allows employees to assess how authentic they think their leader is, and to verify its psychometric properties in samples from Poland, proposing in this way also its Polish adaptation.

In this paper we first describe the concept of authentic leadership and the questionnaire. Afterwards, we discuss its relationships with other variables which can be later treated as a proof of validity of the short version of the ALQ in our research. In order to examine the factorial structure of the construct and test its alternative models, as well as to show the concurrent and predictive validity of the tool, two studies were conducted. We present the results of these studies and discuss them in subsequent sections of the article.

### **The concept of authentic leadership**

At the present time when unethical behavior of many company managers is unveiled, it is especially significant to put attention to behaviors of leaders whose work ethic, attitude and skills are aimed not only at the development of a firm, but also at the personal growth of its employees (Peus, Wesche, Streicher, Braun, & Frey, 2012). Many theoretical conceptions of different types of leader conduct have been coined to portray various leader attitudes and their potential success in organizations. Out of the most popular, transformational leadership (Bass, 1985) is considered as a theoretical and empirical base for other concepts of leadership. It is defined as the ability to influence followers by modifying their values and self-esteem and shift their focus from personal gain towards the good of the organization (Kark, Shamir, & Chen, 2003). In turn, the idea of introducing sincerity and authenticity in work relationships, rather than manipulating or working towards hidden purposes brought about the theory of authentic leadership (Avolio & Gardner, 2005). The essence of authenticity in leadership lies in high ethical standards of the leader, being true to one's identity, personal values and convictions, as well as a genuine desire to serve others through leadership (George, 2003). Avolio, Gardner, Walumbwa, Luthans, and May (2004) posit that because of the demonstrated high morality and integrity, the leader communicates with clarity, and is able to build credibility and win the respect and trust of followers, which is important in any organization (Jaklik & Laguna, 2015).

Authentic leadership is defined as "a process that draws from both positive psychological capacities and a highly developed organizational context, which results in both greater self-awareness and self-regulated positive behaviors on the part of leaders and associates, fostering positive self-development" (Luthans & Avolio, 2003, p. 243). It consists of two core components: self-awareness and self-regulation (Walumbwa et al., 2008). Being self-aware is having an insight into oneself, understanding one's strengths and weaknesses, as well as being conscious of one's impact on other people. Self-regulation is expressed in three types of behaviors: relational transparency, internalized moral perspective and balanced processing of information. Relational transparency is showing one's genuine self to other people by openly sharing information and expressing true thoughts and feelings, while, at the same time, trying to minimize inappropriate emotions and behaviors. Internalized moral perspective is defined as following one's moral standards and values in decision making and behavior at work, rather than yielding to societal or organizational pressures. Balanced processing

of information, as opposed to biased processing, is expressed in an objective analysis of all available data before making a business decision (Avolio & Gardner, 2005).

Avolio and colleagues (2004) propose that contact with authentic leaders results in heightened meaningfulness and significance of work. A trustful and personal relationship between the leader and followers, which is what authentic leadership stands for, increases employees' dedication, a sense of ownership and pride in the profession. As employees become more authentic themselves, they realize that they can achieve more, which should elevate the quality of their activities (George, Sims, McLean, & Mayer, 2007). Theoretical analyses of the outcomes of authentic leadership postulate that authentic leaders strengthen their followers' self-efficacy, feelings of confidence, optimism, resilience, job satisfaction, and extra-role performance (Avolio et al., 2004).

Since the emergence of the concept, a positive impact of authentic approach in promoting human capital and achieving positive outcomes has been proven by a growing number of empirical studies. Authentic leadership was examined in various environments including enterprises, schools, hospitals, and even the military (e.g., Laschinger, Wong, & Grau, 2013; Hannah, Avolio, & Walumbwa, 2011). The outcomes of authentic leadership include trust in leadership, identification with supervisor, job performance and work happiness (Gardner et al., 2011), employee job satisfaction (Azanza, Moriano, & Molero, 2013) as well as employee creativity and work-related flow (Zubair & Kamal, 2015). In more recent time-lagged studies, authentic leadership was found to predict follower performance outcomes through learning goal orientation (Mehmood, Hamstra, Nawab, & Vriend, 2016) and through team reflexivity (Lyubovnikova, Legood, Turner, & Mamakouka, 2015). The consequences of the authentic leaders–followers relationship were recently summarized by Banks, McCauley, Gardner, and Guler (2016). The meta-analysis of 100 independent samples revealed that authentic leadership is related to attitudinal and behavioral outcomes such as: job satisfaction, follower satisfaction with the leader, creativity, engagement, group or organization performance, organizational citizenship behavior of followers, organizational commitment, empowerment, as well as low counterproductive work behaviors and turnover intentions.

### **Authentic Leadership Questionnaire**

The field of research on authentic leadership is dynamically growing, and its development is dependent on a valid measurement of the construct. Authentic

Leadership Questionnaire (ALQ) proposed by Walumbwa and colleagues (2008) originated from the conception of authentic leadership (Avolio & Gardner, 2005) and is broadly applied in research. The original version of the ALQ consists of 16 items composing four lower-order factors which are contained in the higher order factor of authentic leadership. Its four subscales capture four authentic leadership dimensions: leader self-awareness, relational transparency, internalized moral perspective, and balanced processing. This model was validated on the data from the United States and the People's Republic of China (Walumbwa et al., 2008). It needs to be stressed that in the original concept it is the perception of authenticity of the leader in the eyes of the followers which is measured by ALQ (Multi-Rater Form). Example item is: *My Leader says exactly what he or she means*. Modifications to this measure allowing the assessment of authentic leadership as rated by the leaders themselves are also available (Self-Rater Form; Avolio, Gardner, & Walumbwa, 2007).

So far two national adaptations of the ALQ were published. The Spanish version was elaborated by Moriano and colleagues (2011), and the Turkish version by Tabak, Polat, Coşar, and Türköz (2012). These studies confirmed the original factorial structure of the measure; however, in the Spanish sample three items which showed low factors loadings were eliminated from the measure (items 4 and 5 from the dimension of relational transparency and item 7 from the dimension of internalized moral perspective). This suggests that further studies concerning factorial structure of the measure in different cultural contexts are needed, as well as that the short 13-item version may be worthy of further validation. The shortened version may be useful in studies including many measures which are time consuming, and in on-line research. Therefore, we attest the psychometric properties of the ALQ Multi-Rater Form. As until now the psychometric properties of the Polish version of the measure have not been available, our research also provides and attests the Polish adaptation of the ALQ (Multi-Rater Form). Because of the rapidly growing interest in the concept of authentic leadership, it is of vital importance to carefully test the reliability and validity of the ALQ scales in different national samples.

### **Correlates of authentic leadership**

To assess the concurrent and predictive validity of the ALQ, we investigate correlations of its scales with measures of other organizational constructs which are theoretically postulated to be connected with authentic leadership. Since authentic leaders facilitate high quality relationships through their high ethics

and transparency in relationships, they should encourage organizational commitment and job satisfaction, as well as prevent burnout and turnover intention in their employees. We explain this in detail below stating our hypotheses related to the validity of the ALQ.

Job satisfaction involves two types of attitudes that people may experience at work: how they feel and what they think about it (Organ & Near, 1985). Job satisfaction is associated with high quality relationships between employees and supervisors (Hsieh, 2016), and in previous studies it was found to be positively related to authentic leadership (Wong & Laschinger, 2013; Giallonardo, Wong, & Iwasiw, 2010). Therefore, we expect positive relationship between perceiving a leader as authentic and being satisfied with one's job, confirming concurrent (Hypothesis H1a) and predictive validity (Hypothesis H1b) of the ALQ.

Organizational commitment understood as a relationship between the employee and their workplace which determines a desire to stay in the organization (or to leave it), is expressed in three dimensions describing affective, continuance and normative commitment (Meyer & Allen, 1991; see also Łaguna, Mielniczuk, Żaliński, & Wałachowska, 2015). Affective commitment refers to an emotional attachment and identification with the workplace; continuance commitment is of instrumental character and is reflected in one's concerns that leaving the organization would involve excessive cost; normative commitment reflects the person's moral obligation to stay with the organization. Jensen and Luthans (2006) showed that the affective component of commitment is more strongly related to authentic leadership than other components. When managers are perceived as more authentic, their employees wish to remain within the organization basically because they want to, not because of a sense of obligation or fear of losing resources which their work provides. Therefore, we expect positive relationship between authentic leadership and affective organizational commitment, confirming concurrent (Hypothesis H2a) and predictive validity (Hypothesis H2b) of the ALQ.

Burnout is defined as a psychological response to chronic work stress which is characterized by emotional exhaustion and disengagement from the performed tasks (Halbesleben & Demerouti, 2005). Emotional exhaustion refers to being overextended and deprived of one's emotional and physical resources which is caused by an excess of job demands (Baka & Basińska, 2016). It is manifested by overall exhaustion, lack of energy to work, as well as touchiness and impulsiveness. The other component, disengagement, is described as withdrawal from coworkers, clients and an overall context of work: tasks, organization values and culture (Baka & Basińska, 2016). Supportive leadership ought to

counteract burnout by building healthy work environments. This was confirmed by empirical research: authentic leadership is negatively related to burnout (Laschinger et al., 2013), and positively related to work engagement, which in turn, is negatively correlated with burnout (Adil & Kamal, 2016). These findings suggest that we can expect negative relationship between authentic leadership and burnout, confirming concurrent (Hypothesis H3a) and predictive validity (Hypothesis H3b) of the ALQ.

Turnover intention – an intention to leave the organization (Mobley, Griffeth, Hand, & Meglino, 1979) – causes problems for companies as it is an expression of withdrawal behavior in the workplace. An increase in turnover rates can be caused, among other factors, by poor leader-member exchange (Griffeth, Hom, & Gaertner, 2000). Unobscured communication and free exchange of ideas within the organization encouraged by authenticity of managers should prevent employees from wishing to abandon the workplace. Azanza and colleagues (2015) found that authentic leadership has a negative effect on turnover intention of employees. Thus, we also expect negative relationship between authentic leadership and turnover intention, confirming concurrent (Hypothesis H4a) and predictive validity (Hypothesis H4b) of the ALQ.

## STUDY 1

The aim of the first study was to test alternative measurement models of the concept of authentic leadership as captured by the ALQ and to verify the psychometric properties of the questionnaire. The research was conducted in two waves of measurement with a two-week interval (Time 1 and Time 2), which allows to examine the predictive validity and temporal stability of the ALQ scales.

### Method

**Participants.** In the first study wave (Time 1) 350 Polish employees (including 223 women, 63.7% of the sample) took part, their age ranged between 18 and 64 years ( $M = 33$ ,  $SD = 9.1$ ). The majority of the participants (166 employees) worked in services, 66 in education, 29 in administration, 20 in production/craftsmanship, 16 were lawyers, and 10 worked in construction companies. Most of the participants had received higher education (82% of the sample), the remaining 18% had received secondary education. They lived in

different regions of Poland: mainly in Lubelskie, Podkarpackie, Mazowieckie, and Małopolskie Provinces.

**Procedure.** The participants were contacted individually by trained researchers at work or during professional trainings, after obtaining agreement of their supervisors. They completed paper-and-pencil versions of the measures, including the ALQ, anonymously. To allow the identification of each participant at Time 2, they were provided with unique personal codes. The confidentiality of the study was assured as the completed questionnaires were put into sealed envelopes. Participation in the study was voluntary and the participants did not receive any financial gratification. The employees were contacted again after two weeks (Time 2). As 258 employees took part in Time 2 measurement, the return rate was 74% of the total Time 1 sample. Univariate analyses of variance indicated that there were no significant differences in sex, age, and main work characteristics between the participants who took part in both study waves and participants who dropped out after Time 1 (for all ANOVA  $F$  test  $p > .05$ ).

**Measures.** To measure *authentic leadership*, we administered the Polish version of the ALQ (described in detail in the previous section) at Time 1 and Time 2. The items were rated on a 5-point scale, from 0 = *not at all* to 4 = *frequently, if not always*. To ensure conceptual equivalence to the English original version, collaborative-iterative translation was carried out (Douglas & Craig, 2007). Firstly, the questionnaire was translated into Polish by three independent translators. Secondly, all three versions were discussed, the inconsistencies resolved, and the final version of the instrument was agreed upon.

To assess *job satisfaction*, we applied the Satisfaction With Job Scale (Zalewska, 2003) based on the Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) at Time 2. It is composed of five statements which concern a comprehensive outlook on work viewed as a complex phenomenon and is assessed on the basis of personal criteria. An example item is: *The conditions of my work are excellent*. The responses are rated on a 7-point scale from 1 = *totally disagree* to 7 = *totally agree*. The Cronbach's alpha in the present study was  $\alpha = .89$ .

To measure *burnout*, we used the Oldenburg Burnout Inventory (Demerouti, Bakker, Vardakou, & Kantas, 2002; Polish adaptation by Baka & Basińska, 2016) at Time 2. It is composed of 16 items (e.g., *During my work, I often feel emotionally drained*), the responses are given on a 4-point scale, from 1 = *definitely agree* to 4 = *definitely disagree*. The internal consistency in the presented study was  $\alpha = .86$ .



In order to assess *affective organizational commitment*, the affective subscale of Organizational Commitment Scale (Meyer & Allen, 1991; Polish adaptation Bańka, Wołowska, & Bazińska, 2002) was used at Time 2. It includes 6 items (example item: *The organization has a great deal of personal meaning for me*), the responses are given on a 5-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. The Cronbach's alpha in the present study was  $\alpha = .85$ .

*Turnover intention* was measured by means of a three-item instrument developed on the basis of the measures proposed by Mobley and colleagues (Mobley et al., 1979) and Cammann, Fichman, Jenkins and Klesh (1979) and used at Time 2. The responses are provided on a 5-point scale from 1 = *strongly disagree* to 5 = *strongly agree* (example item: *I often think about quitting my job*). The internal consistency in the present study was  $\alpha = .90$ .

**Data analysis strategy.** To test the factorial structure of the ALQ, we performed a confirmatory factor analysis (CFA) using Amos 23. As in previous studies (Walumbwa et al., 2008), three alternative models were tested. Firstly, we specified a one-factor model (Model 1) with authentic leadership as a latent factor and 16 indicators corresponding to the items of the measure. Next, we specified a hierarchical factor model (Model 2; also called second-order factor model, Walumbwa et al., 2008), in which the items loaded on the four corresponding lower-order latent factors, which in turn loaded on the second-order latent factor of authentic leadership. Thirdly, we built a four-factor model (Model 3; also called first-order factor model; Walumbwa et al., 2008), in which the items loaded on their four corresponding latent factors depicting four authentic leadership dimensions: self-awareness, relational transparency, internalized moral perspective, and balanced processing of information; the factors were allowed to correlate with each other. Finally, having chosen the model that fitted the data better than all the alternative models, we allowed its further modifications by excluding items for which factor loadings were lower than .40 to obtain the short version of the instrument (Model 4).

Missing data was handled using a regression imputation. To assess model fit, we applied recommended model fit indices: chi-square ( $\chi^2$ ), root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), comparative fit index (CFI), and Akaike Information Criterion (AIC). For RMSEA and SRMR values below .08 indicate acceptable fit, and values above .10 indicate poor fit; for CFI values higher than .90 show an acceptable model fit; in case of the AIC, the lower the value, the better the model fits the data (Brown, 2006). To test the differences between alternative models, we calculated the differences in chi-square ( $\Delta\chi^2$ ) and in CFI ( $\Delta\text{CFI}$ ) (Brown, 2006).

Delta CFI which is less than .01 ( $\Delta\text{CFI} < .01$ ) would indicate lack of significant differences between models (Cheung & Rensvold, 2002).

To verify validity of the measure, we analyzed correlations between the ALQ scales (applied at Time 1 and at Time 2) and other variables measured at Time 2.

## Results

**Factorial structure of the ALQ.** First, we specified three alternative models on the data from Time 1 (Table 1). Neither one-factor model (Model 1), nor hierarchical model (Model 2) reached the acceptable model fit criteria. Only the four-factor model in which the items loaded onto the four correlated components of authentic leadership fits the data quite well, except for RMSEA which slightly exceeded .08 value. Values of  $\Delta\chi^2$  and  $\Delta\text{CFI}$  for model comparisons confirm that the four correlated factor model fits the data better than the two alternative models (Table 1). In this model, however, factor loadings of three items (4 and 5 from relational transparency, and 7 from internalized moral perspective) were low (.24 to .33) while all other factors loadings were much higher (.67 to .87). Similarly to the Spanish adaptation of the ALQ (Moriano et al., 2011), we decided to remove these three items proposing the short version of the measure. In consequence, all subsequent analyses are based on the 13-item ALQ version.

The four-factor model with 13 items (Model 4; Table 1) fits the data better than the one-factor model and better than the hierarchical model.<sup>1</sup> In this model all factor loadings are high (.63-.87). The RMSEA value, however, exceeds .08, still being lower than .10. When we allowed one covariance between two error terms (for items 3 and 8) all the model fit indices confirmed acceptable model fit ( $\chi^2_{(58)} = 188.469$ ,  $p < .001$ , CFI = .959, RMSEA = .080, SRMR = .032).

To further verify the four-factor model of the short ALQ version (Model 4), we tested it (without any covariance between error terms) on the Time 2 sample ( $N = 257$ ). This confirmed its good fit, again except for RMSEA ( $\chi^2_{(59)} = 250.479$ ,  $p < .001$ , CFI = .943, RMSEA = .096, SRMR = .037). As a consequence of these analyses, we accepted the four-factor model as the final one and therefore describe the psychometric properties of the short ALQ version below. In this version self-awareness scale contains 3 items, relational transparency 4 items, internalized moral perspective 3, and balanced processing of information consists of 3 items.

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<sup>1</sup> Additionally tested hierarchical model with 13 items also turned out to fit worse than the four-factor model with 13 items ( $\chi^2_{(65)} = 291.585$ ,  $p < .001$ , CFI = .928, RMSEA = .100, SRMR = .041, model comparison  $\Delta\chi^2_{(6)} = 62.245$ ,  $p = .001$ ,  $\Delta\text{CFI} = .018$ ).

Table 1

*Goodness-of-Fit Indices of Alternative Measurement Models in a Sample of Employees (Study 1, N = 350)*

Model	$\chi^2$	<i>df</i>	<i>p</i>	RMSEA	SRMR	CFI	AIC	Model comparison	$\Delta\chi^2$	$\Delta df$	<i>p</i>	$\Delta CFI$
Model 1. One factor: authentic leadership	510.036	104	.001	.123	.074	.849	574.036	M1 vs M4	280.696	45	.001	.097
Model 2. Hierarchical: four factors and higher order factor authentic leadership	469.675	104	.001	.100	.053	.896	533.675	M2 vs M4	240.335	45	.001	.050
Model 3. Four factors: self-awareness, relational transparency, internalized moral perspective, balanced processing of information	366.577	98	.001	.089	.046	.924	474.577	M3 vs M4	137.237	39	.001	.022
Model 4. Four factors: self-awareness, relational transparency, internalized moral perspective, balanced processing of information (13 items)	229.340	59	.001	.091	.035	.946	293.340	–	–	–	–	–

*Note.* RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual; CFI = Comparative Fit; AIC = Akaike Information Criterion.

In the short ALQ version four scales co-vary from .87 (between self-awareness and internalized moral perspective) to .96 (between relational transparency and balanced processing of information). These high correlations suggest that it is also possible to calculate the total score of authentic leadership, as well as its four dimensions.

Table 2 shows the descriptive statistics, reliability, and correlations between four ALQ scales as measured at Time 1 and Time 2.

Table 2

*Descriptive Statistics, Reliability, and Correlations Between the Short Version of ALQ Scales in a Sample of Employees at Time 1 (N = 350) and Time 2 (N = 258; Study 1)*

ALQ scale	Time 1			Time 2			1	2	3	4
	<i>M</i>	<i>SD</i>	$\alpha$	<i>M</i>	<i>SD</i>	$\alpha$				
1. Self-awareness	8.20	4.10	.88	8.26	4.09	.90	<b>.82</b>	.75	.75	.77
2. Relational transparency	6.29	3.26	.80	6.44	3.18	.80	.75	<b>.86</b>	.75	.73
3. Internalized moral	6.65	3.25	.79	6.70	3.06	.81	.73	.76	<b>.82</b>	.74
4. Balanced processing of information	6.53	3.30	.84	6.56	3.02	.82	.77	.74	.72	<b>.82</b>

*Note.* Correlations between scales at Time 1 are presented below the diagonal and correlations at Time 2 above the diagonal; correlations demonstrating test-retest reliability are presented on the diagonal (in bold italics); all correlations are statistically significant at a level of  $p < .001$  (two-tailed).

**Reliability of the short version of the ALQ scales.** To analyze the reliability of the scales, first the Cronbach's alpha coefficients were calculated for two measurement times. The scales of the short version of the ALQ showed high levels of internal consistency as Cronbach's alpha coefficients varied between .79 to .88 at Time 1, and between .80 and .90 at Time 2 (Table 2). The highest indicators in both measurement times were obtained for self-awareness scale. The overall score of authentic leadership also shows high internal consistency ( $\alpha = .95$ , both at Time 1 and Time 2).

Next, we performed test-retest analysis on 258 employees who took part in both study waves to verify the temporal stability of the short version of the ALQ scales. The correlations for each scale (Table 2) after two weeks were all proved to be statistically significant and high: for self-awareness, for relational transparency, and for balanced processing of information  $r = .82$  ( $p < .001$ ), for internalized moral perspective  $r = .86$  ( $p < .001$ ), and for the overall score of authentic leadership  $r = .92$  ( $p < .001$ ). Moreover, the test-retest correlations for each scale are higher than any correlations between the scales measured at Time 1 or Time 2.

**Validity of the short version of the ALQ scales.** To determine validity of the short version of the ALQ scales, the correlations between authentic leadership and four criteria variables: job satisfaction, affective organizational commitment, burnout, and turnover intention were calculated (Table 3).

Table 3

*Correlations Between the Short Version of ALQ Scales (Applied at Time 1 and at Time 2) and Other Variables (Measured at Time 2) in a Sample of Employees (N = 258; Study 1)*

ALQ scale	Correlations between ALQ scales applied at Time 1 and other variables at Time 2				Correlations between ALQ scales applied at Time 2 and other variables at Time 2			
	Job satisfaction	Organizational commitment	Burnout	Turnover intention	Job satisfaction	Organizational commitment	Burnout	Turnover intention
Self-awareness	.26***	.43***	-.17**	-.36***	.29***	.42***	-.24***	-.29***
Relational transparency	.23***	.36***	-.19***	-.32***	.25***	.38***	-.27***	-.30***
Internalized moral perspective	.30***	.42***	-.25***	-.38***	.25***	.39***	-.25***	-.28***
Processing of information	.27***	.36***	-.18**	-.38***	.30***	.41***	-.26***	-.30***

Note. \*\*  $p < .01$ ; \*\*\*  $p < .001$  (two-tailed).

To assess concurrent validity, we analyzed correlations between the short version of the ALQ scales and all criteria variables measured at the same study wave, namely at Time 2. We found statistically significant and positive correlations of the ALQ scales with job satisfaction (ranging from  $r = .25$  to  $r = .30$ ), and affective organizational commitment (ranging from  $r = .38$  to  $r = .42$ ), and negative correlations with burnout (ranging from  $r = -.24$  to  $r = -.27$ ) and turnover intention (ranging from  $r = -.28$  to  $r = -.30$ ). This confirms hypotheses H1a, H2a, H3a, and H4a, providing evidence for the concurrent validity of the measure.

To assess predictive validity, we analyzed correlations between the short version of the ALQ scales applied at Time 1 and all criteria variables measured at Time 2, assuming that authentic leaders may influence subsequent attitudes of their followers (Gardner, Avolio, Luthans, May, & Walumbwa, 2005). For all ALQ scales (Table 3) we obtained statistically significant and positive correlations with job satisfaction (ranging from  $r = .26$  to  $r = .30$ ), and with affective organizational commitment (ranging from  $r = .36$  to  $r = .43$ ), and negative correlations with burnout (ranging from  $r = -.17$  to  $r = -.25$ ) and turnover

intention (ranging from  $r = -.32$  to  $r = -.38$ ). This confirms hypotheses H1b, H2b, H3b, and H4b, providing evidence for the predictive validity of the ALQ.

## DISCUSSION

In relation to the factorial structure of authentic leadership, the results of the study demonstrated that the four correlated factors model fits the data better than the two alternative models. To obtain the short version of the ALQ, we have removed three items with factor loadings lower than .40, which was also done by Moriano and colleagues (2011) in the Spanish adaptation of the ALQ. What is important, exactly the same three items showed low factor loadings in both Polish and Spanish samples. Subsequent analyses confirmed high reliability and validity of the 13-item ALQ version. Internal consistency and test-retest reliability indices showed high reliability of all scales. Correlations between ALQ scales in our study at Time 1 range from .73 to .77 and at Time 2 from .73 to .77, being very similar to those obtained with the use of the Spanish 13-item version in which they ranged from .71 to .79 (Moriano et al., 2011). In terms of concurrent validity, it was found that perceived authentic leadership was positively related to employee job satisfaction and affective organizational commitment, and negatively to burnout and intention to leave the organization. The predictive validity of scales was confirmed as well. The results show that if employees perceive their leader as authentic, they are more satisfied with their job, more committed, less likely to leave the organization, and less burnt out. These results confirm good psychometric properties of the short version of the ALQ in the Polish sample of employees of different professions. As the instrument was shortened, it is however valuable to confirm its factorial structure on other independent samples.

## STUDY 2

The aim of this study was to further attest the factor structure of authentic leadership on another sample, i.e., on nurses. The data was gathered as a part of a bigger research project allowing us also to further validate the short version of the ALQ.

## Method

**Participants.** The study was conducted on 101 female nurse, aged 23 to 60 ( $M = 41$ ,  $SD = 9.8$ ) from Tarnów and Kraków regions. The education level of the nurses was the following: bachelor's degree (47%), master's degree (26%) and secondary education in the field of nursing (27%). They all worked in a hospital (52%) or in a clinic (48%).

**Procedure.** Participants were recruited in individual contact with trained researchers at work, with the agreement of their supervisors. Each nurse received a set of paper-and-pencil measures, and was informed of the purpose, confidentiality and anonymity of the study. The participation was voluntary and the participants did not receive any remuneration. They were informed that they were free to resign from the participation without stating the reasons; however, none of the participants decided to resign and all the measures were returned in sealed envelopes without any missing data.

**Measures.** To measure *authentic leadership*, the Polish version of the ALQ (described in the previous sections) was used.

**Data analysis strategy.** The same strategy as used in Study 1 was applied to test factorial structure of the measure.

## Results

**Factorial structure of the short version of the ALQ.** To further verify the factorial structure of the ALQ, we attested four alternative models, the same as in Study 1. The model with four correlated latent factors (Model 3) fit the data better than the one-factor model and better than the hierarchical model, however none of them reached acceptable fit criteria (Table 4). As in Study 1, attesting the short version of the ALQ, we also specified a four-factor model using 13 items (Model 4). Standardized regression weights of the deleted items ranged from .25 to .71. This model obtained acceptable fit in all fit indices, except of RMSEA, which was, however, lower than .10. Moreover, this model was found to fit the data better than any model based on 16 items. These findings provided further support for the decision to exclude three items from the measure and confirmed that four correlated factors of the short ALQ version are a better representation of authentic leadership than the alternative models. All ALQ scales were positively correlated (Table 5).

Table 4

*Goodness-of-Fit Indices of Alternative Measurement Models in a Sample of Nurses (N = 101; Study 2)*

Model	$\chi^2$	df	p	RMSEA	SRMR	CFI	AIC	Model comparison	$\Delta\chi^2$	$\Delta df$	p	$\Delta CFI$
Model 1. One factor: authentic leadership	297.485	104	.001	.136	.096	.795	361.485	M1 vs M4	198.981	45	.001	.154
Model 2. Hierarchical: four factors and higher order factor authentic leadership	297.485	104	.001	.136	.096	.795	361.485	M2 vs M4	198.981	45	.001	.154
Model 3. Four factors: self-awareness, relational transparency, internalized moral perspective, balanced processing of information	246.982	98	.001	.123	.091	.842	322.982	M3 vs M4	148.478	39	.001	.107
Model 4. Four factors: self-awareness, relational transparency, internalized moral perspective, balanced processing of information (13 items)	98.504	59	.001	.082	.051	.949	162.504	–	–	–	–	–

*Note.* RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual; CFI = Comparative Fit; AIC = Akaike Information Criterion.

Table 5

*Descriptive Statistics, Reliability, and Correlations Between the Short Version of ALQ Scales in a Sample of Nurses (N = 101; Study 2)*

ALQ scale	M	SD	$\alpha$	1	2	3
1. Self-awareness	9.64	3.52	.91			
2. Relational transparency	13.01	3.81	.75	.52		
3. Internalized moral perspective	10.22	3.63	.65	.63	.60	
4. Balanced processing of information	7.64	2.72	.82	.66	.58	.82

*Note.* All correlations are statistically significant at a level of  $p < .001$  (two-tailed).



**Reliability of the short version of the ALQ scales.** In the sample of nurses, the Cronbach's alpha reliability indices (Table 5) are generally high, being the highest for self-awareness ( $\alpha = .91$ ) and lowest for internalized moral perspective ( $\alpha = .65$ ). The Cronbach's alpha for the overall score of authentic leadership was high  $\alpha = .93$ .

## DISCUSSION

The model with four correlated latent factors including 13 ALQ items fit the data better than any of the alternative models (Walumbwa et al., 2008). Exclusion of three items, the same as in Study 1, resulted in a best model fit. The short version of the ALQ scales was found to have satisfactory to high internal consistency.

## GENERAL DISCUSSION

The aim of the research was to attest psychometric properties of the Polish version of the ALQ. We have analyzed its factorial structure in two samples of Polish employees and nurses. The results confirmed the four-factor structure of the short 13-item version of the ALQ and acceptable psychometric characteristics of its scales, simultaneously proving that it fits the data better than the 16-item version.

The analyses revealed that out of the alternative models, the four correlated factor model based on 13 items fits the data best in two independent Polish samples, better than the hierarchical model. The findings of the Turkish (Tabak et al., 2012) and Spanish (Moriano et al., 2011) adaptation studies supported the hierarchical model; however, the Spanish data required eliminating three items from the model for a better approximation with the data, the example which we followed. Nevertheless, in none of the two Polish samples analyzed in our research did the hierarchical model reach the acceptable fit criteria, even after excluding three times with lowest factor loadings (see footnote 1). This suggests that the hierarchical model based on 16 ALQ items does not achieve cross-culture-measurement invariance, as configural equivalence (Little, 1997; Laguna, Mielniczuk, Razmus, Moriano, & Gorgievski, 2017) of this model was not reached in Polish samples nor in the Spanish sample (Moriano et al., 2011). Configural equivalence is a prerequisite for more strict measurement invariance

levels and when it is not achieved, further steps of invariance testing cannot be performed (Little, 1997). This suggests that dimensionality of the full version of the ALQ and factor loadings of its items should be carefully analyzed in future studies in different cultures. Conversely, the short 13-item ALQ version attested in our research was further confirmed in another study as cross-culturally invariant, obtaining not only configural but also partial scalar invariance level in samples from the Netherlands, Poland and Spain (Wałachowska, 2017). Since short instruments gain more interest, especially in on-line research (Łaguna, Bąk, Purc, Mielniczuk, & Oleś, 2014), this short ALQ version may be useful in future studies.

The results of both studies confirm reliability of the short 13-item version of the ALQ scales, their high internal consistency as well as high temporal stability. Since the ALQ was designed to measure authenticity of the leader in different contexts, we examined two independent samples of participants: employees of different professions and nurses. Even though the factorial structure was confirmed in both samples, internal consistency of the internalized moral perspective scale was found to be lower in the sample of nurses, however still acceptable for research purposes. This suggests that the ALQ scales are sensitive to the sample's characteristics. This could be explained by sample specificity and homogeneity: in comparison to the sample of employees of different professions, the nurses were considerably older and they were all female.

In regard to concurrent and predictive validity of the short version of the ALQ, the positive relationships with job satisfaction and organizational commitment, as well as negative relationships with turnover intention and burnout were confirmed. These findings are in agreement with previous research results (Azanza et al., 2015; Azanza et al., 2013; Laschinger et al., 2013) upholding the validity of the short version of the ALQ. Furthermore, as one of our studies was time-lagged, authentic leadership can be regarded a predictor of higher job satisfaction and organizational commitment, as well as lower levels of burnout and turnover intention.

The presented study confirmed that authentic leadership is related to job satisfaction and commitment in employees, which proves that such leader attitudes are a valuable resource for an organization (Avolio & Gardner, 2005), especially in a long-term perspective. In general, costs of outsourcing and hiring new employees are higher than training current team members and their leaders. Hence, coaching of leaders could be directed at boosting their authenticity, as authentic leadership lowers followers' burnout as well as their intention to leave the organization.

Our research is, however, not free from some limitations. Firstly, despite the fact that we examined two independent samples, most of our participants received higher education, they mostly resided in south-eastern and southern Poland, and the sample from Study 2 consisted of women only. The samples' specificity limits our conclusions and thus more research is welcome to test the validity of ALQ on other samples. Secondly, the purpose of this research was to deepen the understanding of how subordinates perceive authenticity in their superiors which they did using a Multi-Rater Form of the ALQ. However, there is a need to validate the Polish version of the ALQ Self-Rater Form, in which the leaders state how authentic they view themselves. A separate adaptation of that form would allow scholars to compare results between managers and their employees thus inspiring future research.

Concluding, the results of our studies suggest that the short 13-item version of the ALQ resulted in a reliable and valid measure. Its scales can be applied in both academic research and work environments. As leadership is considered a core element of management, it inevitably arouses the interest of scholars from different disciplines. This is not surprising, as leaders define the mission of an organization, set specific goals, manage and motivate the efforts of employees (Ensley, Pearce, & Hmieleski, 2006), and may stimulate their innovativeness (Purc et al., 2015). That is why it is important to study leadership for both scientific and practical purposes. To do this, a valid measure capturing this construct is necessary, and we believe the short version of the ALQ presented here fulfills these criteria.

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