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Authentic Leadership Measures: An Authentic Measure for Authentic Leadership?

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Abstract

This study broadly addresses some of the criticisms associated with authentic leadership theory related to measurement and antecedents. Measurement: One purpose of this study was to verify the dimensionality of authentic leadership by testing the construct validity of three measures for authentic leadership: the Authentic Leadership Questionnaire (ALQ), the Authentic Leadership Inventory (ALI), and the Authentic Leadership Integrated Questionnaire (AL-IQ), proposed by Levesque-Cote et al. (2018) as an improvement on the previous two scales. This study was designed to replicate and extend Levesque-Cote et al. (2018) study with an English-speaking sample to further test the structural validity of the AL-IQ. This study was not designed to test the nomological network, associated outcomes for Authentic Leadership, or convergent and divergent validity. As such, we first employed confirmatory factor analysis (CFA), experimental structural equation modeling (ESEM), and bifactor analytic modeling (BAM) to validate the structure of the two original scales and the combined AL-IQ. In line with the Levesque-Cote et al. (2018) study, a four-factor ESEM model best fit the data for the AL-IQ, suggesting that the scale will work similarly in English-speaking samples. Antecedents: A second purpose of this study was to examine correlations between the three measures of authentic leadership and the perceived emotional intelligence of leaders. This study failed to establish discriminant validity between authentic leadership and emotional intelligence, as there were very strong correlations between all four scales, suggesting that emotional intelligence is an essential part of authentic leadership.

Introduction

The development of a theory for Authentic Leadership (AL) has been marred by persistent criticism. Criticism includes the need for more studies with AL in terms of culture and gender, factor development for internalized moral perspective, empirical redundancy with other theories of moral leadership (ethical leadership, servant leadership) empirical redundancy with transformational leadership, the definition for AL, exploring the nomological network associated with AL (is there a positivity bias built into the theory), the practice or application

of AL to the workplace, developing antecedents to drive training interventions and coaching, and measuring AL (See Crawford et al., 2020; Sidani & Rowe et al., 2018; Gardner et al., 2021; Allvesson et al., 2019; Banks et al., 2016; Lemoine et al., 2019; Hoch et al., 2016). One purpose of this study was to address the psychometric issues associated with authentic leadership by extending the work of Levesque-Cote et al. (2018) with the AL-IQ in an English-speaking sample. This study is broadly focused on the structural validity of the AL-IQ. A second purpose of this study was to determine if emotional intelligence is an antecedent for AL. In this article, we will briefly describe AL, describe related constructs with a focus on emotional intelligence, address AL measurement issues before outlining the purpose, method, and results of the current research. Finally, we discuss the theoretical and practical implications, research limitations, and offer recommendations for future research with both the AL-IQ and AL at large.

Authentic Leadership

Over the last twenty-five years, the topic of authenticity and leadership has garnered the attention of both leadership practitioners and scholars. Attention to authenticity and leadership often surfaces when leaders face conflicting social pressure and grapple with complex ethical issues, forcing them to juggle responsibilities to self, followers, and stakeholders (Alverson & Einola, 2019; Novicevic et al., 2006). The theoretical development of AL must be understood within this context especially related to ethical failures in the United States corporate sector (Alverson & Einola, 2019; Iszatt-White & Kempster, 2019). One of the first to present AL to the public at large, George (2003) called for a new approach to leadership based upon self-awareness and values. George suggested self-awareness involves knowing one's strengths and weaknesses along with one's developmental needs related to leadership. George (2007) also stressed the importance of a leader knowing her personal values and ethical boundaries. The development of George's (2007) AL model was based upon qualitative interviews with successful leaders and a meta-analysis of empirical leadership studies. In building his model, George (2015) also relied upon the work of Abrahm Maslow, Carl Rogers, Douglas McGregor, Daniel Goleman, and Warren Bennis. Specifically, George (2015) mentions the importance of emotional intelligence from Goleman, crucible events from Bennis and Thomas, and Bennis who stressed the importance of character to leadership. George (2003) was also influenced by Max DuPree who broadly stressed the importance of serving others (servant leadership) and moral purpose.

Some see the development of a theory for AL resulting from the failure of charismatic and transformational leadership theory in addressing corporate ethical failures in the 1990s (Iszatt-White & Kempster, 2019). As such, Bass and Steidlmeier (1999) introduced the idea of authentic transformational leadership, which has not gained much traction in the literature (See also Bass B. & Riggio R. 2006). The actual development of a theory for AL originated with Luthans and Avolio (2003) who called for a new leadership style with a strong moral component, being authentic to one's true self, and leadership role modeling. As previously noted, the theoretical development of AL is best understood in the historical and social context of corporate ethical failures. In light of the original focus on morals/ethics, it is surprising the factor structure for the moral domain of AL is criticized as being poorly developed (Luthans & Avolio 2003; Avolio & Gardner, 2005; May et al., 2003; Crawford et al., 2020; Sidani & Rowe et al., 2018; Gardner et al., 2021; Alvesson et al., 2019).

Definition of Authentic Leadership

According to Crawford et al. (2020) the most commonly used definition for AL is that of Walumbwa et al. (2008):

> *A pattern of leader behavior that draws upon and promotes both positive psychological capacities and positive ethical climate, to foster greater self-awareness, an internalized moral perspective, balanced processing of information, and relational transparency on the part of leaders working with followers, fostering positive self-development* (p. 94).

Researchers have criticized this definition on various grounds. Banks et al. (2016) pointed out that it did not explain the four factors of AL. Crawford et al. (2020) and Lemoine et al. (2019) faulted the lack of parsimonious distinction related to what is and what is not considered AL. Sidani and Rowe (2018) and Lemoine et al. (2019) criticized this definition for the inclusion of both antecedents and consequences. Finally, Alvesson and Einola (2019) objected to the inclusion of outcomes in the definition, as this results in poor construct validity and an inability to specify the factor structure. Taken as a whole, these criticisms are significant as poor construct definition often results in problems with how a specific construct relates to a developed measure (Sidani & Rowe, 2018). As a result, some researchers have offered new definitions for AL. One definition offered by Crawford et al. (2020) is an authentic leader is one who influences and motivates followers to achieve goals through sincerity and positive moral perspective, enabled through heightened awareness, and balanced processing. Another definition offered by Sidani and Rowe (2018) focused more upon leader-follower interactions, defining AL as legitimated follower perceptions of a leader's authenticity which are activated by moral judgements. Problems associated with the definition for AL contributes to measurement-related concerns and undermines theory development.

Factor Structure for Authentic Leadership

The four factors of AL are self-awareness (SA), relationship transparency (RT), balanced processing (BP), and internalized moral perspective (IMP) (Walumbwa et al., 2008). Self-awareness involves understanding one's strengths and weaknesses, core values, identity, motives, goals, and how leader behavior impacts followers (Northouse, 2010). Relational transparency is the process of openly sharing information and the true expressions of one's thoughts and feelings (Peterson et al., 2012). Balanced processing refers to objectively analyzing all relevant information before making a decision and allowing others to openly challenge deeply held ideas or beliefs within an organization (Diddams & Chang, 2012). Internalized moral perspective refers to a leader's behavior and actions being guided by clear set of moral standards rather than others or organizational pressure (Peterson et al., 2012).

Researchers have questioned the factor structure of AL, particularly when it comes to internalized moral perspective. As previously noted, this factor has been criticized for being underdeveloped. As such, Gardner et al. (2021) pointed out the need to address the fact that a leader can be authentic but not ethical. Sidani and Rowe (2018) criticized this factor for not including followers in a shared value system with leaders. Finally, Crawford et al. (2020) criticized the overall factor structure for not including informal influence, or the ability of a leader to inspire and motivate followers to accomplish goals of their own, regardless of rank or position. Other aspects of poor factor structure will be discussed under Measuring AL. Problems associated with the factor structure for AL contributes to measurement-related concerns and undermines theory development.

Research on Authentic Leadership

Prior research on AL has investigated the association between AL and attitudinal and behavioral outcomes in organizational settings (Banks et al., 2016; Gardner et al., 2011; 2021). This is consistent with the original development of AL, focused on a normative and functionalist approach designed to measure organizational outcomes (Iszatt-White & Kempster, 2019). For example, perceptions of AL are strongly correlated with follower job satisfaction (Azanza et al., 2013; Jensen & Luthans, 2006; Levesque-Cote et al., 2018), follower satisfaction with supervisor (Banks et al., 2016; Walumbwa et al., 2008), group and organizational performance (Banks et al., 2016), task performance (Leroy et al., 2012; Levesque-Cote et al., 2018), trust in leadership (Clapp-Smith et al., 2009), organizational commitment (Jensen & Luthans, 2006; Walumbwa et al., 2008), and organizational citizenship behaviors (Walumbwa et al., 2008). Overall, the research on AL is criticized for an overfocus on measuring organizational outcomes at the expense of understating antecedents and a lack of qualitative research (Banks 2016; Hoch, Bommer, & Dulebohn, 2016; Iszatt-White & Kempster, 2019). However, Gardner et al. (2021) challenges these views suggesting research on AL shows all of the signs of a fully developing theory of leadership. Problems associated with research on AL seems to be associated with poor development of the antecedents for AL. This not only creates challenges for training interventions or coaching to develop AL but also undermines theory development.

Emotional Intelligence

The empirical study of emotional intelligence (EI) intensified with the work of Salovey and Mayer (1990) who understood it as a subset of social intelligence. Salovey and Mayer's abilities or skills model of EI includes the ability to monitor one's and others' feelings and emotions, to discriminate among them, and to use this information to guide one's thinking and actions (Mayer et al., 2008). Similarly, Bar-On's (2006) competencies model focuses on an individual's latent abilities, assessed through performance of tasks and self-report measures (thus, a "mixed-type"). Finally, the personality-trait model of EI assumes individual differences in four primary latent variables: perception of emotions, managing one's own emotions, managing others' emotions, and the utilization of emotions, assessed through a self-report questionnaire (Schutte et al., 2009; Schutte et al., 1998). Scores on the corresponding psychometric measures for all three models (ability, self-report, and mixed) show a relationship between effective leadership and effective leadership style and have predicted organizational outcomes including job satisfaction, task performance, and organizational citizenship behaviors (Miao et al., 2016).

Numerous studies provide evidence of the positive association between EI and AL. Miao et al. (2018) conducted a meta-analysis of EI (ability, self-report, and mixed types) and AL and reported a strong correlation between self-report EI and AL ($r = .52$) and mixed EI and AL ($r = .49$). Saher, Saleem, and Iqbal (2013), using the Assessing Emotions Scale and the eight-item version of the ALQ, reported a very strong correlation between EI and AL ($r = .85$). Adiguzel and Kuloglu (2019), using the Bar-On, self-report scale with fifteen dimensions for EI, along with the ALI reported a strong correlation ($r = .51$). Kotze and Nel (2015) using the five-dimensional Rahim Emotional Quotient, self-report, along with the ALQ reported correlations between scores on the ALQ and the EI factors of self-awareness ($r = .23$), self-regulation ($r = .22$), empathy ($r = .24$), social skills ($r = .23$), and motivation ($r = .15$). Kotze and Nel (2017) also used the Rahim Emotional Quotient and the ALQ and reported similar correlations with empathy ($r = .28$), self-awareness ($r = .26$), social skills ($r = .26$), and self-regulation ($r = .25$).

These positive correlations suggest a significant overlap of the two constructs, which is germane to this study in terms of developing antecedents to drive training interventions and coaching for AL development.

Measuring Authentic Leadership

The development of a theory for authentic leadership (AL) has been limited by controversies surrounding psychometric measurement of the construct, including article retractions associated with the ALQ (Peterson, 2014; Walumbwa, 2014). However, the primary concerns include both the ALQ and the ALI. Both the ALQ and ALI were designed to measure the multidimensional nature of authentic leadership, with its proposed four factors. However, empirical evidence establishing the multidimensional nature of the construct is weak (Banks et al., 2016; Gardner et al., 2021; Levesque-Cote et al., 2018). There are several possibilities for this weak empirical support.

The first is the original decision by researchers to frame AL as a multidimensional construct. Measuring multidimensional constructs creates a unique set of reliability, validity, and criterion related measurement issues (Edwards 2001; Lemoine et al., 2019). Another possibility is weak discriminant validity between the factors. For example, Levesque Cote et al. (2018) highlighted an item from the ALQ ("My leader seeks feedback to improve interactions with others") that could also tap into relational transparency due to its use of "interactions with others." Similarly, "seeks feedback" may also tap into balanced processing. A third possibility is that investigations into the factor structure of the ALQ and ALI have relied upon only confirmatory factor analysis (CFA) (See Crede & Harms, 2015; Gardner et al., 2021). The primary drawback of using CFA alone is the restrictive nature of factor loadings, hindering any association with other related dimensions (Marsh et al., 2014). This could preclude consideration of potential cross-loadings and understanding the nature of the construct as a whole. A final possibility is weak construct validity, or the extent to which a measure captures the underlying construct of interest (Bagozzi & Edwards, 1998). Weak construct validity occurs when a construct is too broad, incorporating aspects of other distinct constructs (Messick, 1994). For example, there are strong correlations ($.72 \leq rs \leq .75$) between transformational leadership and AL, especially when measuring with the ALQ (Banks et al., 2016; Hoch, Bommer & Dulebohn, 2016). Finally, critical to this study are the reported correlations between EI and AL. In summary, the problems associated with the ALQ and ALI are weak empirical evidence establishing the multidimensional nature of the construct and weak construct validity.

The Authentic Leadership Questionnaire (ALQ)

The most widely used scale is the Authentic Leadership Questionnaire (Pioli et al., 2020). The 16-item ALQ is comprised of four factors: self-awareness, relational transparency, balanced information processing, and internalized moral perspective. The original validation process for the ALQ included content validation and model testing using confirmatory factor analysis. Confirmatory factor analysis supported a second order factor structure in both American and Chinese samples (Walumbwa et al., 2008). Caza et al. (2010) also found the second order model best fit the data in a study from New Zealand. In the Walumbwa et al. (2008) study, scores on the four factors of the ALQ were positively correlated with ethical and transformational leadership, though the relationships were not strong enough to suggest conceptual redundancy. Convergent validity was established showing positive correlations between perceptions of AL and follower job satisfaction and individual job performance. Pioli

et al. (2020) reported use of the ALQ in twelve research studies, validating outcomes associated with engagement, team performance, organizational identity, innovation, and organizational justice. Other studies provide evidence of the factor structure and generalizability of the ALQ in other cultures, including New Zealand (Caza et al., 2010), Portugal (Rego et al., 2013), Germany (Peus et al., 2012), Brazil and Portugal, (Cervo et al., 2016), and Pakistan (Akbar et al., 2019).

It is important to note that factor development with the ALQ is not without controversy. Sidani and Rowe (2018) suggested the ALQ is problematic as a weak definition for AL results in poor construct conceptualization. Crede and Harms (2015) criticized previous research with the ALQ, including incorrect analysis and not comparing alternative models, such as bi-factor analytic modeling. As previously noted, there were three article retractions associated with the ALQ. In a follow-up article on the development of ALQ, the authors acknowledge problems associated with the development of the ALQ:

> *Revisiting the analyses that were reported in the Walumbwa et al. (2008) article to examine the construct validity of the authentic leadership, it is important to explicitly state that we did not report the use of modification indices in the structural equation analyses to covary the error variance of some of the indicators of fit statistics, a procedure described in many structural equation modeling (SEM) textbooks* (Avolio et al., 2017, p. 400).

Although the authors acknowledged problems, Avolio et al. (2017) defended the ALQ on several fronts. First, the authors pointed out that the analysis of the ALI by Neider and Schriesheim (2011) produced a factor structure identical to that of the ALI, suggesting the ALI is nothing new. Second, Caza et al. (2010) found the ALQ supported a second order model as the best fit to the data. Third, Neider and Schriesheim (2011) advanced the idea that modeling authentic leadership as either a four-factor or higher-order model should depend on the situation or context under study. Finally, using CFA guidelines established by Crede and Harms (2015) including the addition of bi-factor modeling, Avolio and colleagues reexamined the original Walumbwa et al. (2008) data set. Results showed that the higher-order model best explained the covariation among manifest variables, lower order factors, and variation in lower order factors and manifest variables (Avolio et al., 2017).

The Authentic Leadership Inventory (ALI)

Neider and Schriesheim (2011) developed the ALI in response to concerns over the ALQ that included the following. First, too few people (doctoral students and subject matter experts) participated in the content validation process. Second, there was conceptual ambiguity over differences between AL and transformational leadership. Third, the full version of the ALQ, with 16 questions, is restricted to those who commercially purchase the measure (the 8-item version of the ALQ is commercially available to the public at large). Finally, Neider and Schriesheim (2011) questioned the employment of confirmatory factor analysis with the use of "garbage parameters" that could inflate model fit for the ALQ.

The ALI is a 14-item, multi-dimensional scale with the four factors of self-awareness, relational transparency, balanced information processing, and internalized moral perspective. Using the theoretical framework of Walumbwa et al. (2008), Neider and Schriesheim (2011) developed 14 new items and paraphrased two of the eight ALQ items available to the public. In three studies, they conducted content validation on the ALI with the 8-item version of the ALQ, as well as a series of confirmatory factor analyses using data obtained by having participants

rate 2008 presidential candidates (McCain and Obama) and their current supervisor. After dropping two items, model testing provided evidence in support of the theorized four factors. Internal consistency reliability (alpha) coefficients for the ALI subscales ranged from $.74 \leq r_{\alpha} \leq .85$. Convergent validity for the ALI was established showing a positive relationship between perceptions of authentic leadership and followers' satisfaction with supervisor, organizational commitment, and job satisfaction.

Neider and Schriesheim (2011) then compared a one-factor model, a four-factor correlated model, and a four-factor second order model. Results provided strong evidence for the four factor versus the one factor model, but there was little difference between the second order and correlated factors models. However, in combined studies using the ALI, Steffens et al. (2016) found support for the higher-order model of authentic leadership. Several studies have established the reliability of the ALI with Cronbach's alpha coefficients ranging from $.74 \leq r_{\alpha} \leq .90$ (Balogun et al., 2020; Men & Stacks, 2014; Stander et al., 2015). More broadly, Pioli et al. (2020) reported the ALI was used to establish convergent validity between AL and job satisfaction, engagement, optimism and confidence, innovation, and organizational communication and effectiveness. Finally, Stander et al. (2015) provided evidence of the factor structure and generalizability of the ALI to a South African context.

The Authentic Leadership-Integrated Questionnaire (AL-IQ)

Starting with the existing measures for AL (ALQ and ALI), Levesque-Cote et al. (2018) employed confirmatory factor analysis (CFA) and exploratory structural equation modelling (ESEM) to examine the construct validity of both instruments in a French-speaking sample of private workers in Canada. For the ALQ, the CFA data revealed that seven of the sixteen items loaded on other factors besides the targeted latent variable, with large cross loadings suggesting significant overlap among the factors. For the ALI, six of fourteen items did not load on the targeted factors with many large cross loadings, and there were strong correlations among the four factors of authentic leadership when using CFA. In both cases, the ESEM model, which allows all items to load on all factors while "targeting" the theorized domain, was superior to CFA (which restricts loadings on non-targeted factors to zero).

Levesque-Cote et al. (2018) then combined all thirty items from the ALQ and ALI in an ESEM model for the purpose of identifying a subset of items that would best represent the four factors of the construct. The ESEM showed excessive overlap with the ALQ and ALI, highlighting a failure to capture the distinctiveness among the four components of AL. Items were therefore chosen according to three criteria: (1) items which presented their highest loading on their primary a priori factor (2), that they have no large ($\geq .30$) or unexplained cross loading (3) that they pass a review by two independent judges. The resulting 14-item Authentic Leadership-Integrated Questionnaire (AL-IQ) had 3-4 items loading on one of four factors. The first and second order four-factor models provided a satisfactory fit to the data, as well as being invariant across genders.

Levesque-Cote et al. (2018) then used the AL-IQ on a second sample of French-Canadian workers in the public sector. The results again supported the four-factor model ESEM model as superior, with no differences between first and second order CFA models. Convergent validity was established showing positive associations between perceptions of AL and higher levels of job satisfaction, work performance, and lower levels of psychological stress.

The results from the Levesque-Cote et al. (2018) study contribute to the ongoing process of establishing construct validity with AL. First, the Levesque-Cote et al. (2018) study highlighted

the utility of ESEM for investigating multidimensional constructs like AL. This study adds to a growing body of empirical evidence related to ESEM, including established leadership constructs, such as transformational and ethical leadership (Boamah & Tremblay, 2018; Langlosis et al., 2014). A second contribution is the inability of the ALQ and the ALI to capture clear distinctions between the four factors of authentic leadership. This raises concerns with outcomes tied to authentic leadership measures, conceptual overlap, and correspondence between the prior subscales (Levesque-Cote et al., 2018). A third contribution is that this study supports the generalizability of AL theory across genders and work sectors. For example, results from this study showed the AL-IQ as appropriate for both men and women and across public and private works sectors. However, in this study, women were more inclined to recognize relational transparency, balanced processing, and internalized more perspective.

The Current Research

This study addresses some of the criticism associated with AL theory development related to measuring AL and developing antecedents to drive training interventions and coaching. Measurement: The purpose of this study was to explore the structural validity and the structural reliability of the three authentic leadership measures currently found in the literature (Authentic Leadership Questionnaire; Authentic Leadership Inventory; Authentic Leadership-Integrated Questionnaire) by extending and replicating the analytic methods from the Levesque-Cote et al. (2018) in an English-speaking sample. This approach is consistent with Pioli et al. (2020) who called for applying the AL-IQ to other populations to validate and consolidate the measure. To expand on Levesque-Cote et al. (2018), we employed confirmatory factor analysis (CFA), experimental structural equation modeling (ESEM), and bi-factor analytic modeling (BAM) to test the AL-IQ. Antecedents: To establish discriminant validity, we tested the relationship between the three measures of authentic leadership (ALQ, ALI, AL-IQ) and a commonly used measure of emotional intelligence.

We had three main questions:

1. *What is the dimensionality of the three authentic leadership measures currently found in the literature (ALQ, ALI, and AL-IQ)?*
2. *Will the AL-IQ replicate in an English-speaking sample when fitting the same factor analytic modeling strategy?*
3. *What is the relationship between the three measures of authentic leadership and emotional intelligence when fitting with the same factor analytic modeling strategy?*

Method

Participants and Procedure

Participants were recruited through Amazon's Mechanical Turk (MTurk) in 2019. All questions were presented in English. Participants were in the hierarchical role of the follower/subordinate, evaluating a current or recent leader on AL and EI. Internal Review Board approval granted by the University of Oklahoma. Informed consent was obtained from all individual participants included in the study.

A total of 410 participants completed 4 surveys in exchange for $4.00 through MTurk. After discarding 24 cases for taking too little time (less than two minutes) or selecting the same response for all items, the final sample consisted of N = 386 (44.6% female, mean age = 39.36, SD = 10.68). The sample was primarily white (84.7%), Asian (6.2%), Black (4.9%),

Hispanic or Latino/a (3.1%), Pacific Islander (0.5%), and American Indian (0.3%). Reported educational levels included four-year degree or higher (56.9%) and an associate degree, certification, or some college classes (26.8%). Sectors of work employment included the private sector (66.5%), the public sector (27.0%), and non-profit organizations (6.5%). (Full demographic information appears in *Table 1*).

***Table 1*: Demographic Information**

Job Function		
Which of the following does your current job function most closely fit?		
Retail/customer service	89	23.1
Manufacturing/industry	64	16.6
Business	120	31.2
Health/social services	53	13.8
Operations	59	15.3
Current Employer		
How long have you been with your current employer?		
Six months of less	12	3.1
One year	15	3.9
Two years	33	8.6
2-5 years	125	32.5
5+ years	200	51.9
Current Supervisor		
How long have you had your current supervisor/boss?		
Six months of less	28	7.3
One year	37	9.6
Two years	59	15.3
2-5 years	137	35.6
5+ years	124	32.2

Measures

Participants in the study completed the following surveys in this order: (1) the Authentic Leadership Questionnaire (2) the Authentic Leadership Inventory (3) the Authentic Leadership-Integrated Questionnaire (4) the Modified, Assessing Emotions Scale. The means, standard deviations, internal consistency reliabilities (alpha), and zero-order Pearson correlations appear in *Table 2*, with the 95% confidence intervals in brackets (all confidence intervals were obtained using bias-corrected and accelerated bootstrapping [N = 5,000]).

Table 2: ***Internal consistency reliability, mean, standard deviations, and zero-order correlations between the Assessing Emotions Scale (AES), the Authentic Leadership Questionnaire (ALQ), the Authentic Leadership Inventory (ALI), and the Authentic Leadership-Integrated Questionnaire (AL-IQ)***

	α	M	SD	ALQ	ALI	AL-IQ
AES	.963	3.58	0.71	.836 [.802, .867]	.878 [.850, .902]	.871 [.844, .894]
ALQ	.953	3.61	0.86		.928 [.911, .943]	.913 [.891, .931]
ALI	.950	3.72	0.84			.959 [.949, .967]
AL-IQ	.950	3.71	0.83			

Note: **All four variables were negatively skewed; reflected square root transformations corrected them to normality prior to correlational analyses. Confidence intervals obtained with bias-corrected and accelerated bootstrapping (*N* = 5,000).**

Authentic Leadership Questionnaire. The Authentic Leadership Questionnaire (ALQ; Walumbwa et al., 2008) is a 16-item scale (α = .95) asking participants to measure how each statement fits their current or last supervisor on a five-point scale (Not at all; Once in a while; Sometimes; Fairly often; Frequently if not always). The ALQ contains four questions focusing on self-awareness, five on relational transparency, three on balanced processing, and four on internalized moral perspective. (*See* Appendix for ALQ).

Authentic Leadership Inventory. The Authentic Leadership Inventory (ALI; Neider & Schriesheim, 2011) is a 16-item questionnaire (α = .95) asking participants to measure how each statement fits their current or last supervisor on a five-point scale (Disagree strongly; Disagree; Neither agree nor disagree; Agree; Agree strongly). The ALI contains four questions focusing on self-awareness, four on relational transparency, four on balanced processing, and four on internalized moral perspective. (*See* Appendix for ALI).

Authentic Leadership-Integrated Questionnaire. The Authentic Leadership-Integrated Questionnaire (AL-IQ; Levesque-Cote et al., 2018) is a 14-item questionnaire (α = .95) asking participants to rate how each statement fits their current or last supervisor on a five-point scale (Never; Seldom; Sometimes; Often; Always). The AL-IQ contains three questions focusing on self-awareness, three on relational transparency, four on balanced processing, and four on internalized moral perspective. (*See* Appendix for AL-IQ).

Emotional Intelligence. The Modified Assessing Emotions Scale (AES; Schutte et al., 2009; Schutte et al., 1998; Gong et al., 2018; Ng et al., 2010), is a 33-item, self-report inventory (α = .96). A modified version of the Assessing Emotions Scale was used in this study, asking followers to evaluate the EI of their current or last supervisor. Specifically, the scale asked participants to indicate how each statement fits their current or last supervisor on a five-point scale ranging from Strongly disagree to Strongly agree. The original AES contains ten questions focusing on perceptions of emotions ("I expect good things to happen"), nine on managing one's emotions ("I have control of over my emotions"), eight on managing others' emotions ("By looking at facial expressions, I recognize the emotions people are experiencing"), and six on the utilization of emotions ("Some of the major events in my life have led me to re-evaluate what is important and not important"). (*See* Appendix for Modified AES).

Data Analyses

Data cleaning and preliminary analyses were performed using SPSS version 24. CFA and ESEM (ML, target rotation) were performed make use of MPlusj 7. The MPlus code is available in supplementary materials. Following Levesque-Cote et al. (2018) first and second order confirmatory factor analyses (ICM assumptions) and Exploratory Structural Equation Modelling (ESEM) were performed on the ALQ, ALI, and the AL-IQ. To compare subscales across the three scales, factor scores were extracted from ESEM and correlated with AES scores. Factor scores

for all subscales but the ALQ-BP and ALIQ-SA were negatively skewed. The ALI-RT, ALI-MP, ALQ-SA, ALQ-RT, ALQ-MP, ALIQ-BP, ALIQ-RT were corrected to normality with reflected square root transformations. The ALIQ-MP and ALI-BP required logarithmic transformations.

Model Testing

Confirmatory Factor Analysis (CFA)

The use of CFA to examine multidimensional constructs has dominated organizational and leadership research over the last thirty years (Crede & Harms, 2015, 2019). CFA is typically used to assess the hypothesized item or construct relationship and the hypothesized distinction among latent constructs reflected in the data (Crede & Harms, 2019). The primary weaknesses with CFA are the use of independent cluster models (ICM), constraining an item to correspond only to a single factor, while also constraining cross loadings to zero. In relation to measures for authentic leadership, several examples of problems exist with using ICM. For example, in using CFA to test the ALQ, the observation of residual associations among items not explained by prior items resulted in the inclusion of two post hoc correlations for the model of interest (Walumbwa et al., 2008; Levesque-Cote et al., 2018). A similar issue occurred in the development of the ALI, with two items excluded from the measure (Neider & Schriesheim, 2011).

Exploratory Structural Equation Modeling (ESEM)

In contrast to CFA, ESEM permits simultaneous cross loadings, allowing the identified factors to influence each other (Levesque-Cote et al., 2018; Hair et al., 2010). ESEM incorporates EFA and CFA, ensuring that all models are fitted without the restrictive limitations of CFA. As previously discussed, a growing body of empirical research supports the ESEM model as a better fit to the data with multidimensional leadership constructs. Boamah and Tremblay (2018) found that ESEM had a superior fit to CFA in measuring correlations with the Multifactor Leadership Questionnaire 5X (MLQ-5X) and transformational leadership. Langlosis et al. (2014) found that the ESEM had a superior fit when measuring with the Ethical Leadership Questionnaire (ELQ) and ethical leadership. Regarding measures for authentic leadership, only the Levesque-Cote et al. (2018) study used ESEM to examine the factor structure of AL.

Bi-factor Analytic Modeling (BAM)

Bi-factor analytic modeling facilitates hypothesizing relationships between each specific dimension, along with relationships between a global factor and covariates. The BAM is mathematically equivalent to a second-order model when using constraints from the Schmid-Lieman transformation (Chen et al., 2006). In fact, the second-order model is nested into the bi-factor model through factor loadings. This nesting allows the for the comparison of second-order models with the bi-factor model. However, the BAM provides distinct advantages over the second-order model. The most significant advantage is with test measurement invariance among the domain factors (Chen et al., 2006). Murray and Johnson (2013) reported empirical evidence supporting the superior fit of the BAM compared to the second order model. However, the authors urged caution as the preferred model depends on the purpose of the measurement model. In regard to measures for authentic leadership, only Avolio et al. (2017) used the BAM to examine factor structure of the ALQ.

Fit Criteria

To evaluate model fit, we used the Tucker-Lewis Index (TLI), the Comparative Fit Index (CFI), the Standard Root Mean Square Residual (SRMSR), and the Root Mean Square Error of Approximation (RMSEA). There is widespread general agreement on the use of the Tucker-Lewis Index (TLI), the Comparative Fit Index (CFI), the Standard Root Mean Square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA) (Crede & Harms, 2015; Browne & Cudeck, 1993). In this study, the cut off scores for global fit indices are TLI = .90; CFI = .90; and RMSEA = .08 (Browne & Cudeck et al., 1993; Hair et al., Hennessey et al., 2017). We acknowledge there is a debate in academic circles on what is considered fit criteria for model testing. For example, Kline et al, (2015) argues for the inclusion of the chi-square test when using ESEM. However, one could argue the chi-square test deviates with larger sample size, such as this study. The purpose of this study was not to be an end all in terms of resolving this debate. Rather, we are simply reporting the fit criteria used for this study understanding some editors simply view the world differently which is what drives academia.

Results

Factor Structure and Model Comparison

The ALQ

Table 3: **Results from confirmatory and exploratory analyses for the Authentic Leadership Questionnaire (ALQ), Authentic Leadership Inventory (ALI), and Authentic Leadership Integrated Questionnaire (AL-IQ)**

	Par	χ^2	df	SRMSR	RMSEA [90% CI]	PCLOSE	CFI	TLI	SBC
ALQ									
First Order	54	516	98	.045	.105 [.096, .114]	< .001	.911	0.891	14764
Second Order	51	608	101	.200	.114 [.105, .123]	< .001	.892	0.871	14848
ESEM									
Four Factors	90	184	62	.020	.071 [.060, .083]	.002	.974	0.950	14532
ALI									
First Order	48	330	71	.042	.097 [.087, .108]	< .001	.936	0.918	12342
Second Order	45	412	74	.134	.109 [.099, .119]	< .001	.917	0.898	12414
Bifactor	56	247	63	.032	.087 [.076, .099]	< .001	.955	0.935	12280
ESEM									
Four Factors	78	116	41	.017	.069 [.054, .084]	.018	.982	0.959	12210
AL-IQ									
First Order	48	402	71	.053	.110 [.099, .120]	< .001	.920	0.898	12190
Second Order	45	481	74	.172	.119 [.109, .130]	< .001	.902	0.879	12262

ESEM Four Factors	78	92.46	41	.015	.057 [.042, .073]	< .001	.988	0.972	11965

***Note:* N = 486. For all three scales, the four-factor model was best fitting (compared with one, two, and three factors) in ESEM (χ^2_{change} *p*s < .001). The bifactor models for the ALQ and the ALIQ either had nonpositive definite theta matrices or failed to converge. *Par*: parameters in model. SRMSR: standardized root mean square residual. RMSEA: Root Mean Square Error of Approximation. PCLOSE: one-sided probability of close fit (RMSEA=.05). CFI: Comparative fit Index. TLI: Tucker-Lewis Index. SBC: Schwarz's Bayesian information criterion.**

The results for the ALQ are consistent with the Levesque-Cote et al., (2018) study, with the ESEM four-factor model providing the best fit to the data with all global fit indices (*see* Table 3 for details of all models). The ESEM four-factor model was superior with the established cut off scores for TLI (.95), CFI (.97), and RMSEA (.07). The first order and second order models with CFA did not meet the established cut off scores for model fit in this study (*see* Figures 1 and 2 for graphical representations of these models). Examination of the residuals from these models suggested a high number of correlated error terms at the item level, thus decreasing the overall fit of the model. The ESEM model counteracts this effect by not constraining the cross-loadings across factors and, hence, improving the overall fit. Finally, the BFA model resulted in a non-positive-definite theta matrix and thus failed to converge with the ALQ. Typically, this result is indicative of an overfitted model. Kline (2015) suggested steps to mitigate an overfitted model. However, these steps run the risk of upward bias when using fit indices.

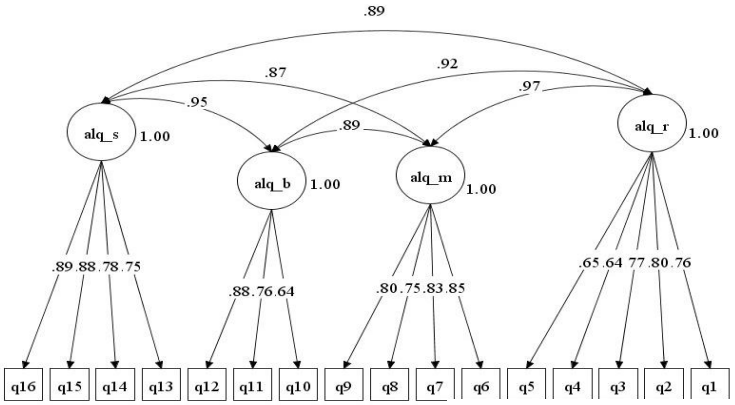

***Figure 1:* ALQ Correlated Factors Model**

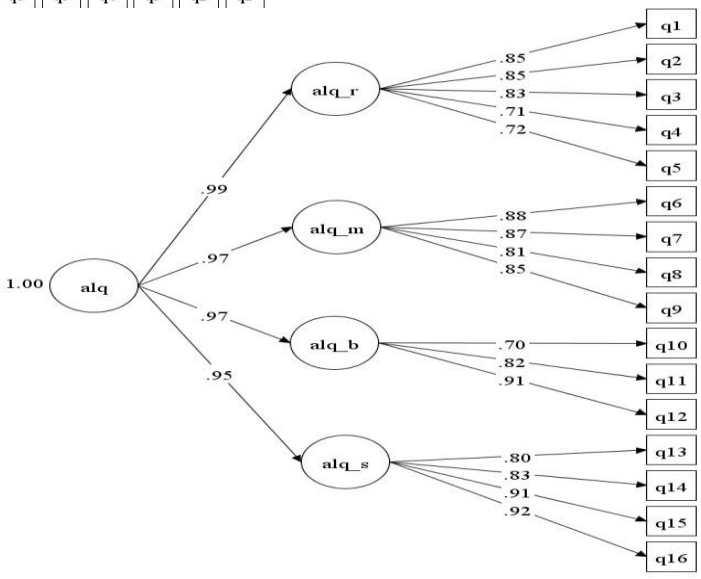

***Figure 2*: ALQ Second Order Model**

The ALI

The results for the ALI are also consistent with the Levesque-Cote et al. (2018) study, with the ESEM four-factor model providing the best fit to the data by all global fit indices (*see* Table 3). The first order and second-order models for CFA did meet the established cut off scores for model fit except for the RMSEA (*see* Figures 3 and 4 for graphical representations of these models). Examination of the residuals from these models again suggests a high number of correlated error terms at the item level, thus decreasing the overall fit of the model. The ESEM model, as before, counteracts this effect by not constraining the cross-loadings across factors and hence improving the overall fit.

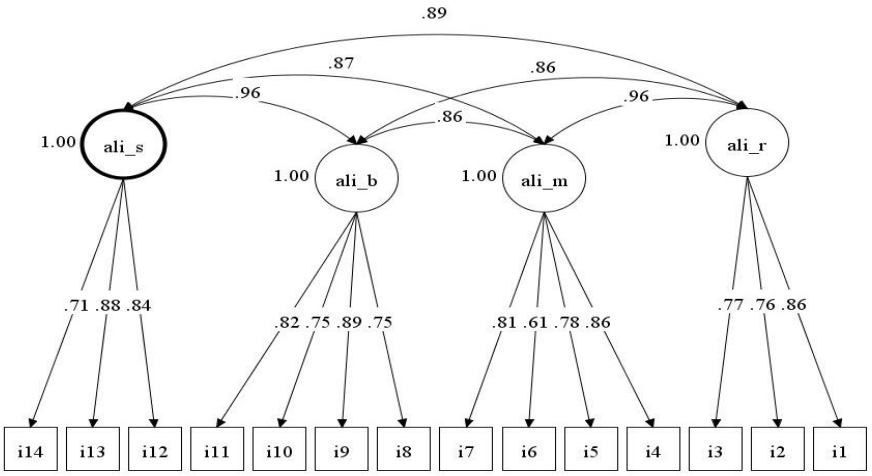

Figure 3: **ALI Correlated Factors Model**

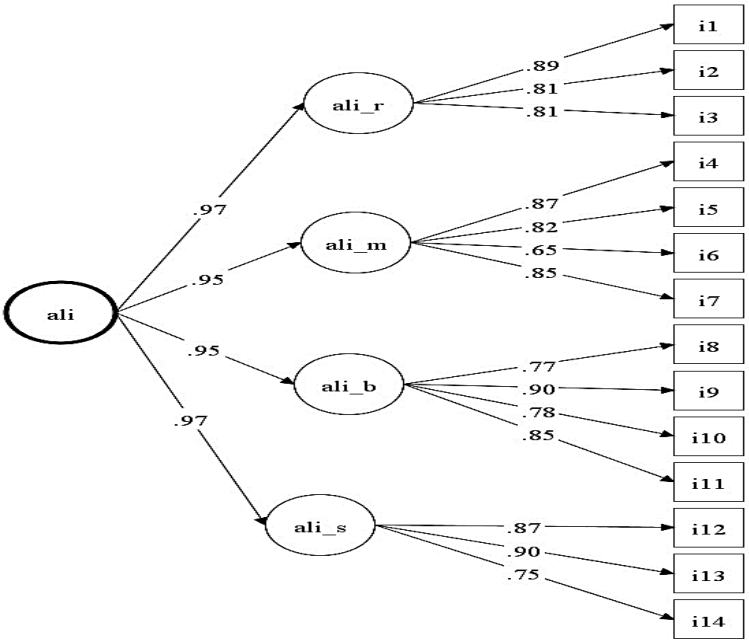

Figure 4: **ALI Second Order Model**

The data results for the BAM model also resulted in an acceptable fit on all but the RMSEA index (.087). Although the BAM model is the conceptually clearest of all the models (*see* Figure 5), the results for the ESEM four factor model appears to better fit to the data on all critical indices.

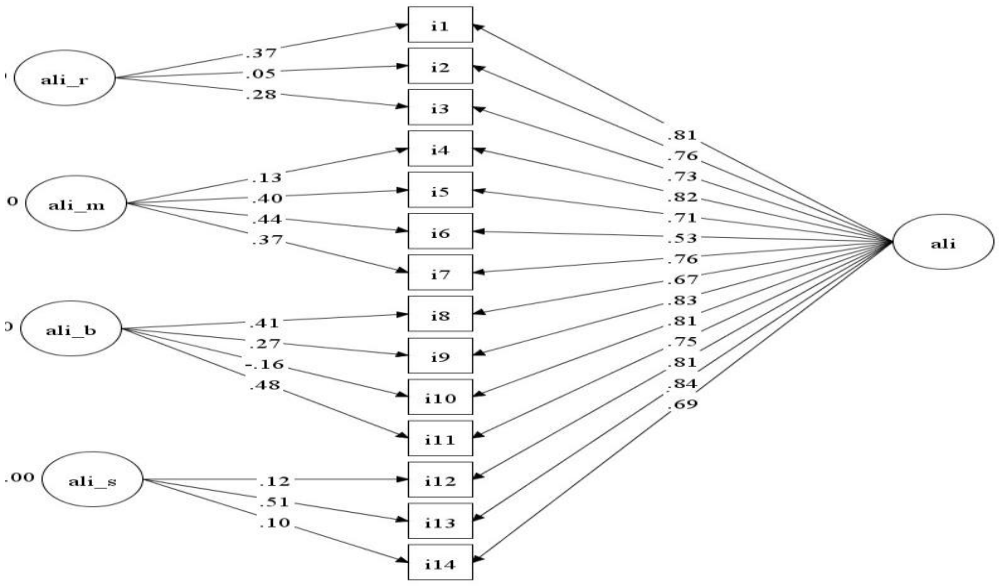

Figure 5: **ALI Bifactor Model**

The AL-IQ

Following the Levesque-Cote et al. (2018) analytic strategy, we fit the 4-factor ESEM model with all 30 items from the combined ALQ and ALI scales (see Table 4). As shown in *Table 3*, the four-factor model fit the data well (TLI = .92; CFI = .94, RMSEA = .068). However, when examining the factor loading after a targeted rotation in which all undesirable cross-loadings were targeted to zero, we see several cross-contamination of loadings across the different factors (highlighted in yellow, *Table 4*). The desirable factor loadings in *Table 4* (identified in bold) indicate the scales which should load highly on each factor. There were also items that loaded negatively on their target factor (highlighted in red, *Table 4*). Because this solution would make the resulting factor scores nearly uninterpretable, we followed the Levesque-Cote et al. (2018) study and reduced the number of items from 30 to 14.

Table 4: **Standardized loadings on the four hypothesized factors of Self-Awareness (SA), Relational Transparency (RT), Moral Perspective (MP), and Balanced Processing (BP) for the 30-item combined ALI and ALQ**

	SA	RT	MP	BP
ALQ_SA1	**0.188** *	0.319***	0.033	0.417***
ALQ_SA2	**0.394** **	0.125	0.148*	0.283***
ALQ_SA3	**0.412** **	0.151*	0.185**	0.271***
ALQ_SA4	**0.442** **	0.223**	0.221***	0.141**
ALQ_RT1	-0.108	**0.750*****	0.235	-0.082
ALQ_RT2	0.128*	**0.522*****	0.052	0.266***
ALQ_RT3	0.087	**0.329*****	0.088	0.505***
ALQ_RT4	0.010	**0.377****	0.295*	0.011
ALQ_RT5	-0.050	**0.428*****	0.239**	0.102*
ALQ_MP1	0.040	0.599***	**0.351*****	-0.098
ALQ_MP2	-0.141*	0.356***	**0.650*****	-0.015
ALQ_MP3	-0.028	0.042	**0.491*****	0.444***
ALQ_MP4	0.025	0.258**	**0.501*****	0.100*

ALQ_BP1	0.112	-0.062	0.301***	**0.519***
ALQ_BP2	0.584***	0.293***	0.120	**-0.156***
ALQ_BP3	0.451***	0.346***	0.012	**0.246***
ALI_SA2	**0.494***	-0.040	0.340***	0.187***
ALI_SA4	**0.528***	0.151*	0.117	0.231***
ALI_SA5	**0.362***	0.116	0.253**	0.089
ALI_RT1	0.093	**0.523***	0.377***	-0.091
ALI_RT2	0.230***	**0.331***	0.212*	0.130**
ALI_RT3	0.236***	**0.366***	0.306***	-0.108*
ALI_MP1	0.133**	0.421***	**0.382***	0.009
ALI_MP2	0.060	-0.173*	**0.937***	-0.021
ALI_MP3	0.025	-0.054	**0.682***	-0.046
ALI_MP4	0.151**	-0.036	**0.736***	0.022
ALI_BP1	0.257***	-0.041	0.167*	**0.588***
ALI_BP2	0.450***	0.233**	0.031	**0.357***
ALI_BP3	0.701***	0.204**	0.176*	**-0.219***
ALI_BP4	0.263***	0.213***	0.047	**0.518***
Standardized Factor Correlations				
SA				
RT	.624			
MP	.621	.767		
BP	.422	.383	.492	

Note: **The 4-factor model fit the data best. $\chi^2(df = 321) = 888.09$, $p < .001$. RMSEA =.068 90% CI [.062, .073], SRMSR = .024, CFI = .944, TLI = 0.92. Rotation = target (Levesque-Cote et al., 2018).**

The results for this reduced item AL-IQ are also consistent with the Levesque-Cote et al. (2018) study, with the ESEM four-factor model providing the overall best fit to the data in this study. The number of large cross-loadings was dramatically reduced from the original 30-item combined measure, and consistent with the results reported by Levesque-Cote et al. (2018) (see Table 5). Again, only the ESEM four-factor model fits the data well across all three global indices (TI = .97; CFI = .988; RMSEA = .057). The fit of the first- and second-order CFA models mostly failed on the RMSEA criterion (see Figures 6 and 7 for graphical depictions of these models as fitted). Finally, the results for the BAM model again displayed either non-positive definite theta matrices or failed to converge in this study.

Table 5: **Standardized parameter estimates for the Authentic Leadership Integrated Questionnaire (ALIQ) measurement models**

	CFA					**ESEM**				
Items	**SA (λ)**	**RT (λ)**	**MP(λ)**	**BP (λ)**	**δ**	**SA (λ)**	**RT (λ)**	**MP (λ)**	**BP (λ)**	**δ**
AL-IQ_SA1	0.801***				.359***	**0.420***	0.187**	0.064	0.326***	.328***
AL-IQ_SA2	0.785***				.383***	**0.277***	0.173**	0.187**	0.304***	.398***
AL-IQ_SA3	0.777***				.397***	**0.157**	0.234***	0.253***	0.269**	.418***
AL-IQ_RT1		0.849***			.280***	0.114*	**0.744***	0.056	0.052	.261***
AL-IQ_RT2		0.736***			.458***	0.023	**0.511***	0.246**	0.019	.463***
AL-IQ_RT3		0.870***			.244***	0.066	**0.712***	0.076	0.104*	.258***

AL-IQ_MP1			0.840**		.295***	0.042	0.338***	**0.644****	-0.118*	.259***
AL-IQ_MP2			0.851**		.276***	-0.152***	-0.133*	**1.079****	-0.007	.176***
AL-IQ_MP3			0.773**		.403***	0.128	-0.003	**0.396****	0.401***	.330***
AL-IQ_MP4			0.821**		.326***	0.055	-0.016	**0.878****	-0.085	.300***
AL-IQ_BP1				0.796***	.366***	0.272**	-0.123*	0.160**	**0.575****	.318***
AL-IQ_BP2				0.778***	.395***	0.622***	-0.035	0.159**	**0.242****	.217**
AL-IQ_BP3				0.883***	.220***	-0.079	-0.054	0.011	**0.974****	.062
AL-IQ_BP4				0.707***	.499***	-0.012	0.425***	0.074	**0.371****	.419***
Standardized Factor Correlations										
SA	--					--				
RT	.827***	--				.249***	--			
MP	.872***	.865***	--			.522***	.735***	--		
BP	.984***	.769***	.829***	--		.603***	.575***	.706***	--	

***Note:* *p < .05; **p < .01; ***p< .001. CFA = confirmatory factor analysis (ICM); ESEM = exploratory structural equation model; Factors: SA = Self-awareness; BP = Balanced processing; RT = Relational transparency; MP = moral/ethical perspective; λ = standardized factor loading, δ = standardized item uniqueness.**

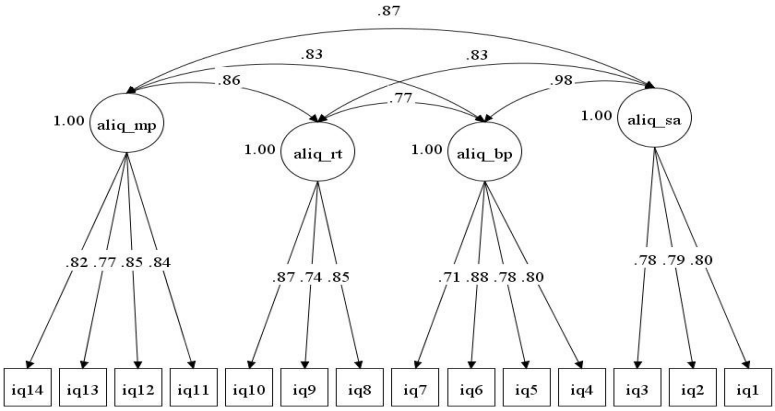

***Figure 6:* AL-IQ Correlated factors model (mp=moral perspective/ /rt=relational transparency /bp =balanced processing/ sa=self-awareness)**

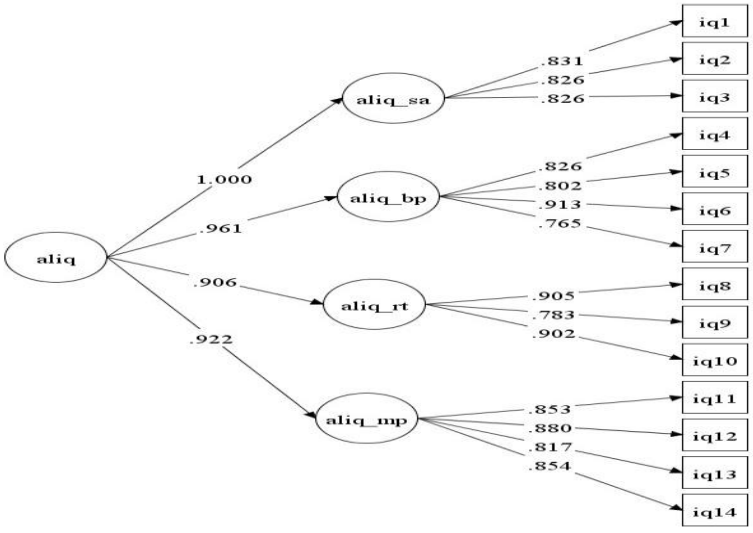

***Figure 7:* AL-IQ, Second-Order Model (sa =self-awareness/ bp=balanced processing /rt=relational transparency /mp=moral perspective)**

Discriminant Validity and the Modified Assessing Emotions Scale

To examine discriminant validity, the final version of the AL-IQ was used with the modified AES for leaders. Factor scores from the ESEM model were calculated and used to assess the degree of overlap with the emotional intelligence measure (modified AES). Finally, for the purposes of the next analysis, the alpha coefficient was calculated for each of the four AL-IQ subscales: SA: r_α = .828, BP: r_α = .865, RT: r_α= .856, IMP: r_α = .820.

The overall results for the zero-order Pearson correlations between the modified AES and the factor scores for the ALQ, ALI, and AL-IQ appear in Table 6. For the ALQ, the zero-order Pearson correlations with the AES and the ALQ show a strong positive relationship between three factors of SA, RT, and MP, all with scores above r = .70. However, the BP (r = -.015), SA (r =.091), and RT (r = -.038) factors were not related to the modified AES, and IMP factor was negatively correlated (r = -.119, p = .020). For the ALI and the AES, the correlations also showed a strong relationship (rs > .70) with RT, MP, and BP, with the relationship with SA more moderate (r = .59). Finally, for the AL-IQ and the modified AES, the relationship among the four factors and the modified AES was also very strong (rs > .71) except for SA (r = .615). See Table 6 for all correlations between AES and factor scores and Table 7 for correlations between AES and total scores on all AL scales.

Table 6: **Zero-order Pearson correlations between scores on the Assessing Emotions Scale (AES) and the factor scores for the three scales (ALQ, ALI, ALIQ)**

	AES	SA	RT	MP
ALQ				
SA	.821 [.783, .855]			
RT	.785 [.743, .822]	.821 [.782, .853]		
MP	.708 [.635, .769]	.734 [.671, .787]	.774 [.722, .818]	
BP	-.015 [-.110, .079]	.091 [-.003, .185]	-.038 [-.139, .061]	-.119[-.202,-.031]
ALI				
SA	.588 [.492, .670]			
RT	.836 [.798, .868]	.661 [.585, .727]		
MP	.763 [.712, .804]	.530 [.439, .614]	.756 [.705, .800]	
BP	.751 [.700, .795]	.335 [.225, .442]	.745 [.690, .793]	.672 [.609, .729]
ALIQ				
SA	.615 [.551, .674]			
RT	.803 [.761, .839]	.700 [.645, .749]		
MP	.714 [.639, .775]	.314 [.213, .407]	.603 [.523, .675]	
BP	.801 [.754, .840]	.614 [.549, .669]	.749 [.697, .795]	.779 [.718, .828]

Note: **95% confidence intervals (bias corrected and accelerated, *N* = 5,000) in brackets.**

Table 7: **Zero-order Pearson correlations between scores on the Assessing Emotions Scale (AES) and total scores on the three authentic leadership scales (ALQ, ALI, ALIQ)**

	AES	ALQ	ALI	AL-IQ
AES	--			
ALQ	.836	--		
ALI	.878	.928	--	

AL-IQ	.871	.913	.959	--

Note: **All correlations significant at $p < .001$.**

This addresses our third question in terms of, we found no evidence of discriminant validity between AL and EI. Specifically, the modified AES scale shows high correlations with the four proposed factors of authentic leadership, suggesting a high degree of overlap between the two constructs as measured and thus less discriminant validity than desirable. Three potential reasons for this follow in the discussion section.

Discussion

This study broadly addresses some of the criticisms associated with authentic leadership theory related to measurement and antecedents. Measurement: One purpose of this study was to explore the structural validity and the structural reliability of the three measures for AL, by extending and replicating the analytic methods from the Levesque-Cote et al. (2018) study, to an English-speaking sample. This study was not designed to test the nomological network or associated outcomes for AL. To establish convergent validity, the study employed confirmatory factor analysis, exploratory structural equation modeling, and bi-factor analytic modeling on the three measures for AL. Antecedents: A second purpose of the study was to establish discriminant validity for AL. To establish discriminant validity, the study examined correlations between the three measures of AL and emotional intelligence using a modified version of the AES for leaders. The results from this study are twofold. One result is the extension and replication of the Levesque-Cote et al. (2018) study to an English-speaking sample. Results also established the convergent validity of the AL-IQ using the four factor ESEM model, which was superior to the CFA and BAM. A second result was the failure in establishing discriminant validity between AL and EI, as there were strong correlations between the two constructs.

Theoretical Implications

The theoretical implications from this study include the following, related to measuring AL. First, this study replicated and extended the Levesque-Cote et al. (2018) study to an English-speaking sample. This is critical as in the Levesque-Cote et al. (2018) study, the ALQ and the ALI had to be translated from English to French (Pioli et., al 2020; Levesque-Cote et al., 2018). This study begins the process of establishing inter-linguistic validity of the AL-IQ with an English-speaking sample. Second, consistent with the Levesque-Cote et al. (2018) study, our study found that the four-factor ESEM model provided the best overall fit for the data. The ESEM was superior to both the CFA and BAM for assessing and capturing the multidimensional factor structure of AL. ESEM remains a critical tool for assessing multidimensional constructs, as it is unbiased in the presence or absence of cross loadings (Edwards, 2001; Langlosis, et al., 2014; Levesque-Cote et al., 2018). Third, the study failed to establish discriminant validity between the constructs of AL and EI. The correlations between the AL measures and the modified AES scale for leaders were all very strong, suggesting at least three different conceptual possibilities.

One possibility is that the AL measures and the modified AES scale are tapping the same construct, although the correlations are not high enough to indicate this as the most probable explanation. This is supported by previous research showing a strong correlation between AES scores and AL, using the ALQ (Saher et al., 2013). A second possibility is high levels of emotional intelligence are potentially a direct cause and/or antecedent of authentic

leadership. A final possibility is there is a strong mono-method effect (relationships between the variables measured with the same method, i.e., MTurk) which contaminates all items on the survey, although the finding of a better-fitting four-factor model compared to both a single factor model or a bifactor model argues against this as the primary reason for the lack of discriminant validity (Campbell et al., 1959; Podsakoff et al., 2003). Despite the use of MTurk, MTurk still offers value as participants tend to better resemble the general population than undergraduate or Internet samples (Arditte et al., 2016; Buhrmester et al., 2011).

Practical Implications

The practical implications from this study include the following related to developing AL (Cooper et al., 2005; Baron et al., 2015). First, Northouse (2019) suggested the theoretical model for AL is designed to describe specific leader behaviors. The strong construct validity of the AL-IQ makes it possible to use questions from the scale to describe AL behaviors as part of training interventions or coaching. Second, the strong correlations in this study between AL and EI provides another tool for training interventions or coaching designed to develop AL. As previously discussed, starting points for developing AL using EI include empathy, self-awareness, social skills, and social regulation (Kotze & Petrus, 2015; 2017). The outcomes for EI and AL are significant for addressing the criticism that AL theory is too focused on measuring outcomes and not identifying antecedents (Banks et al., 2016; Hoch, Bommer, & Dulebohn, 2016; Iszatt-White & Kempster, 2019). Other areas of application for the leadership practitioner are discussed in the conclusion of this article.

Research Limitations

The research limitations from this study include the following items. First, was the monomethod used to collect survey data. The high correlations among the measures in this study may suggest similar response pattern by participants. It is also possible that the use of MTurk contributed to a similar response pattern Cheung et al. (2017) discussed research design pertaining to mono-method bias and suggested that the best way to control for bias is to secure multiple sources of data (e.g., multiple raters to counter common method bias in measurement studies (see Podsakoff et al., 2003). Here, we had research limitations with securing data from multiple raters, as MTurk is not designed to collect multilevel data. Future studies should consider other forms of data collection. However, as suggested before, it is also important to point out the presence of a pure mono-method bias would result in either the BAM model or the single factor model to emerge as the best fitting model. As this was not the case, we cannot attribute all the high correlations to a pure mono-method effect (Campbell et al., 1959; Podsakoff et al., 2003).

A second limitation was the use of self-reported data collection at one time-point. Self-report data holds the possibility of bias in terms of social desirability and impression management (Gardner et al., 2021). Montabon et al. (2018) suggested the importance of longitudinal studies to counter common method bias. Longitudinal studies are also critical as theories of moral leadership (including AL) often develop over a longer period of time (Hoch, Bommer, & Dulebohn, 2016).

A third limitation was the use of MTurk to collect data, making it difficult to assess the nomological network of AL and any associated outcomes. However, that was not the purpose of this study as we were focused on establishing the structural validity of the AL-IQ. Again, we

simply had research limitations with securing data from multiple raters, as MTurk is not designed to collect multilevel data.

Future Research

The limitations with this study have been presented, along with call outs for future research listed below. However, the AL-IQ is a step in the right direction for developing an authentic measure for authentic leadership. The replication and extension of the Levesque-Cote et al. (2018) with this study is another step in addressing the fundamental criticism associated with AL theory, failure to develop a sound measure for the construct. However, future research must focus on these areas of development. One area for future research broadly related to validity for AL is factor versatility. Several researchers argue the multidimensional nature of authentic leadership allows for factor versatility in that cross-contamination of loadings should be modeled as part of the measure (Gardner et al., 2021; Avolio et al., 2017; Alvesson et al., 2019; Banks et al., 2016; Diddams et al., 2012). In fact, Levesque-Cote et al. (2018) acknowledged factor versatility in their study with the AL-IQ. However, the researchers stressed caution as most of the rating outcomes with the AL-IQ occurred with the second-order model. Future studies with factor versatility could be based on either the objectives of a study or the context of a study (Avolio et al., 2018; Neider & Schriesheim, 2011; Levesque-Cote et al., 2018). As noted below, testing the AL-IQ in other work sectors, contexts or cultures will help to facilitate this research goal.

A second area for future research with the AL-IQ is a research design addressing multiple data points, leader feedback, and the addition of test-retest reliability. Future research should also test the association between AL-IQ with other performance measures of EI, such as the MSCEIT 2.0 (Mayer et al., 2004). This could facilitate the determination of what other factors of emotional intelligence beyond those mentioned in this study may apply to training interventions or coaching to develop AL.

A third area of interest is the expansion of the AL-IQ to other cultures, genders, work sectors, and contexts (Crawford et al., 2020). In this study, 45% of the participants were female and 85% were white. Future research should address AL in terms of how the theory applies to male, female, or those with differing gender orientation. The 85% of whites represented in this study fails in providing meaningful comparison across groups. Testing the AL-IQ in sectors such as the military, medical, and disaster response holds significant potential, particularly in light of the recent emergence of a worldwide pandemic. Expanding the AL-IQ to other cultures will also help to counter what Gardner et al. (2021) calls the idea of AL as a representation of a swashbuckling-type of North American culture and leadership (see Han et al., 2019).

A final area of interest is embedding the measures for AL into a nomological network which can predict outcomes. We need other researchers to pick up the ball and conduct research focused on the nomological network, associated outcomes, and convergent and divergent validity.

Conclusion

In light of the persistent criticism associated with AL theory, what does the leadership practitioner do with AL. We offer serval ideas in terms of leadership tools. First, AL theory provides tools for leader self-development. However, we must stress the development of AL theory and empirical outcomes does not equate to good leadership. The application of AL theory to the workplace does not produce a hero like leader who does all the right things to

save an organization. Rather, the development of AL theory provides tools (self-awareness, relational transparency, balanced processing, and internalized moral perspective) for the leadership practitioner. The leadership practitioner may want to look at the True North Field Book for tools focused at the individual level on self-awareness, life stories, and crucible events (Craig et al., 2023). This study has also shown emotional intelligence is another critical tool for AL development. The leadership practitioner may want to look at Goleman's (1998) Working with Emotional Intelligence.

Second, AL theory provides tools for enhancing group and organizational level performance. Empirical outcomes seem to show that AL provides elevated levels of group and organizational performance (Banks et al., 2016; Piccolo et al., 2012; Korku & Kaya, 2022; Blake, 2020). This stands in contrast to Transformational Leadership (TL), which is focused on performance in general. However, Banks et al., (2016) stressed there needs to be more research on specific performance outcomes tied to both AL and TL, as these constructs may be redundant. A starting point for the leadership practitioner may be simply starting with the question what is the purpose of a specific group and then determining if the inclusion of AL is appropriate in terms of sector, culture, mission, and team composition. The True North Field Book provides valuable tools for authentically leading teams (Craig et al., 2023). Might the application of EI and AL together be another valuable tool for enhancing group and organization performance. We need more empirical research in this area, but job satisfaction, task performance, and organizational citizenship behaviors seem to be enhanced for groups in which leaders deploy AL and EI (Miao et al., 2016).

Finally, AL theory provides tools for moral/ethical self-awareness and development. Like many theories of leadership, AL developed in a historical context and time (Rodriguez et al., 2017; Alverson & Einola, 2019; Novicevic et al., 2006). For AL theory, the context and time was ethical failures within the United States corporate sector in the 1990's. As Northouse (2019) noted these ethical failures triggered societal demand for genuine and trust-worthy leaders. These demands also triggered the academic community in developing theories like AL to address corporate ethical failures. However, the failure to fully develop the moral factor of AL is still a significant concern which will continue to draw criticism related to the development of the theory.

We must also stress applying the moral factor of AL does not equate to good moral or ethical leadership. The moral factor of AL is not a magical bullet designed to alleviate moral and ethical failures within organizations. However, in an age of social media saturation, declining levels of trust in traditional institutions, and the perceived eroding of social norms, the importance of a moral approach to leadership cannot be understated. The critical question becomes what does AL theory add to the literature in terms of moral leadership. AL theory provides tools for the leadership practitioner related to clarity or self-awareness around one's moral or ethical values, the importance of leader ethical role modeling, and the importance of a transparent ethical decision-making process, to name a few. A starting point for the leadership practitioner may be identifying one's own ethical temptations, identifying common ethical challenges for corporate or strategic leaders, identifying sector specific ethical challenges, and building ethical cultures and organizations in a global marketplace where values and ethics are culturally embedded. The True North Field Book provides valuable tools for identifying one's values and establishing ethical boundaries in the workplace (Craig et al., 2023).

Clearly, there is more work to do with the theory for AL. As already noted, issues to be addressed include more studies on AL in terms of culture and gender, factor development for internalized moral perspective, empirical redundancy with other theories of moral leadership, empirical redundancy with TL, the definition for AL, exploring the nomological network associated with AL, the practice or application of AL to the workplace, developing antecedents to drive training interventions and coaching, and measuring AL. As we were greatly limited by time, funding, and access to participants, this research addressed two aspects of AL theory, how AL is measured and an antecedent for AL. For those researchers who have ample time, funding, and access to participants, it is now time for you to pick up the ball and conduct multi-level and longitudinal research that moves AL theory forward. There is no perfect research study. This is not a perfect research study but we have addressed some of the criticisms associated with AL related to measuring the construct and identifying possible antecedents.

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Appendix

The Authentic Leadership Questionnaire:

Instructions: The following survey items refer to your leader's style, as you perceive it. Judge how frequently each statement fits his or her leadership style using the following scale:

0=not at all, 1=once in a while, 2=sometimes 3=fairly often 4=frequently is not always

My Leader:

1. says exactly what he or she means. 0 1 2 3 4
2. admits mistakes when they are made. 0 1 2 3 4
3. encourages everyone to speak their mind. 0 1 2 3 4
4. tells you the hard truth. 0 1 2 3 4
5. displays emotions exactly in line with feelings. 0 1 2 3 4
6. demonstrates beliefs that are consistent with actions. 0 1 2 3 4
7. makes decisions based on his or her core values. 0 1 2 3 4
8. asks you to take positions that support your core values. 0 1 2 3 4
9. makes difficult decisions based on high standards of ethical conduct. 0 1 2 3 4
10. solicits views that challenge his or her deeply held positions..... 0 1 2 3 4
11. analyzes relevant data before coming to a decision. 0 1 2 3 4
12. listens carefully to different points of view before coming to conclusions. 0 1 2 3 4

13. seeks feedback to improve interactions with others. 0 1 2 3 4
14. accurately describes how others view his or her capabilities. …….. 0 1 2 3 4
15. knows when it is time to reevaluate his or her positions on important issues. 0 1 2 3 4
16. shows he or she understands how specific actions impact others. 0 1 2 3 4

The Authentic Leadership Inventory:

Response choices are: 1 Disagree strongly; 2 Disagree; 3 Neither Agree nor Disagree; 4 Agree; and 5 Agree strongly.

1. My leader clearly states what he/she means……... 1 2 3 4 5
2. My leader shows consistency between his/her beliefs and actions. …….. 1 2 3 4 5
3. My leader asks for ideas that challenge his/her core beliefs……... 1 2 3 4 5
4. My leader describes accurately the way that others view his/her abilities……. 1 2 3 4 5
5. My leader uses his/her core beliefs to make decisions. …….. 1 2 3 4 5
6. My leader carefully listens to alternative perspectives before reaching a conclusion… 1 2 3 4 5
7. My leader shows that he/she understands his/her strengths and weaknesses……. 1 2 3 4 5
8. My leader openly shares information with others…….. 1 2 3 4 5
9. My leader resists pressures on him/her to do things contrary to his/her beliefs……. 1 2 3 4 5
10. My leader objectively analyzes relevant data before making a decision……. 1 2 3 4 5
11. My leader is clearly aware of the impact he/she has on others…… 1 2 3 4 5
12. My leader expresses his/her ideas and thoughts clearly to others…… 1 2 3 4 5
13. My leader is guided in his/her actions by internal moral standards……. 1 2 3 4 5
14. My leader encourages others to voice opposing points of view……... 1 2 3 4 5

The Authentic Leadership-Integrated Questionnaire:

My leader…

1. … encourages others to voice opposing points of view.
2. … solicits comments to improve his/her way of interacting with others.
3. … clearly states what he/she means.
4. … acts in accordance with his/her stated beliefs.
5. … asks for ideas that challenge his/her core beliefs.
6. … describes precisely how others' views his/her abilities.
7. … openly express his/her thoughts.
8. … bases his/her decisions on its fundamental values.
9. … indicates that he/she understands how certain actions can influence other people.
10. … expresses his/her ideas and thoughts clearly to others.
11. … encourages me to make decisions that are consistent with my fundamental values.
12. … carefully listens to alternative perspectives before reaching a conclusion.
13. … makes decisions based on a rigorous ethical code.
14. … objectively analyzes relevant data before making a decision.

The Modified, Assessing Emotions Scale:

Directions: Each of the following items asks about your leader's emotions or reactions associated with emotions. After deciding whether a statement is generally true, use the 5-point scale to respond to the statement. Please circle the "1" if you strongly disagree that this is like your leader, the "2" if you somewhat disagree that this is like your leader, "3" if you neither agree nor disagree that this is like your leader, the "4" if you somewhat agree that this is like your leader, and the "5" if you strongly agree that this is like your leader.

There are no right or wrong answers. Please give the response that best describes your leader.
1 = strongly disagree
2 = somewhat disagree
3 = neither agree nor disagree
4 = somewhat agree
5 = strongly agree

1. My leaders knows when to speak about my personal problems with others……..1 2 3 4 5
2. When faced with obstacles, my leader remembers times when he/she faced similar obstacles and overcame them……1 2 3 4 5
3. My leader expects that he/she will do well on most things he/she tries…….…… 1 2 3 4 5

4. My leaders finds it easy to confide in others…….. 1 2 3 4 5
5. My leader finds it hard to understand the non-verbal messages of other people……..…… 1 2 3 4 5
6. Some major life events have led my leader to re-evaluate what is important and not important…….. 1 2 3 4 5
7. When my leader's mood changes, he/she see new possibilities…….....……..1 2 3 4 5
8. My leader believes emotions are one of the things that make my life worth living…….. 1 2 3 4 5
9. My leader is aware of his/her emotions as experienced…… 1 2 3 4 5
10. My leader expects good things to happen……... 1 2 3 4 5
11. My leaders likes to share emotions with others…….. 1 2 3 4 5
12. When my leader experiences a positive emotion, he/she knows how to make it last…….. 1 2 3 4 5
13. My leader arranges events others enjoy……... 1 2 3 4 5
14. My leaders seeks out activities that makes him/her happy……. 1 2 3 4 5
15. My leader is aware of the non-verbal messages he/she sends to others……..... 1 2 3 4 5
16. My leaders presents him/herself in a way that makes a good impression on others…… 1 2 3 4 5
17. When my leaders is in a positive mood, solving problems is easy for him/her……... 1 2 3 4 5
18. By looking at their facial expressions, my leader recognizes the emotions people are experiencing……. 1 2 3 4 5
19. My leaders knows when his/her emotions change……... 1 2 3 4 5
20. When in a positive mood, my leader is able to come up with new ideas……1 2 3 4 5
21. My leader has control over his/her emotions……1 2 3 4 5
22. My leader easily recognizes his or her emotions as experienced……1 2 3 4 5
23. My leader motivates him/herself by imagining good outcomes with the tasks I take on……1 2 3 4 5
24. My leaders compliments others when they have done something well……1 2 3 4 5
25. My leader is aware of the non-verbal messages other people send…….....1 2 3 4 5
26. When another person tells my leader about an important event in his or her life, I almost feel as though he/she experienced this event myself …… 1 2 3 4 5
27. When my leader feels a change in emotions, he/she tends to come up with new ideas……...1 2 3 4 5
28. When faced with a challenge, my leader gives up because he/she believe they will fail……1 2 3 4 5
29. My leaders knows what other people are feeling just by looking at them……1 2 3 4 5
30. My leader helps other people feel better when they are down……..1 2 3 4 5
31. My leader uses good moods to help others keep trying in the face of obstacles ……1 2 3 4 5
32. My leader can tell how other people are feeling by listening to the tone of their voice……...1 2 3 4 5
33. It is difficult for my leader to understand why people feel the way they do…… 1 2 3 4 5

About the Authors

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