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Not getting laid: Consumer acceptance of precision fermentation made egg

Oscar Z. THOMAS

Mark CHONG
Singapore Management University, markchong@smu.edu.sg

Angela K. Y. LEUNG
Singapore Management University, angelaleung@smu.edu.sg

Tricia M. FERNANDEX

Shu Tian NG

Leader-Expressed Humility: Development and Validation of Scales Based on a Comprehensive Conceptualization

Kraivin Chintakananda
Faculty of Business Administration, University of Macau
Avenida da Universidade, Taipa, Macau, China
Email: kraivinc@um.edu.mo

James M. Diefendorff
Department of Psychology, The University of Akron
Akron, OH 44325, USA
Email: jdiefen@uakron.edu

Burak Oc
Lee Kong Chian School of Business, Singapore Management University
50 Stamford Road 178899, Singapore
Email: burakoc@smu.edu.sg

Michael A. Daniels
Sauder School of Business, University of British Columbia
679-2053 Main Mall, Vancouver, B.C. V6T 1Z2, Canada
Email: michael.daniels@sauder.ubc.ca

Gary J. Greguras
Lee Kong Chian School of Business, Singapore Management University
50 Stamford Road 178899, Singapore
Email: garygreguras@smu.edu.sg

Michael R. Bashshur
Lee Kong Chian School of Business, Singapore Management University
50 Stamford Road 178899, Singapore
Email: mbashshur@smu.edu.sg

Corresponding author: Kraivin Chintakananda, Faculty of Business Administration, University of Macau, Avenida da Universidade, Taipa, Macau, China.
E-mail: kraivinc@um.edu.mo **Tel:** +853 88224658

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Abstract

We introduce new leader humility scales capturing a theoretically rich conceptualization of leader-expressed humility aligned with traditional and ethically-grounded philosophies. These scales draw from recent inductive research (Oc et al., 2015) identifying nine dimensions of leader-expressed humility: (1) having an accurate view of self, (2) recognizing follower strengths and achievements, (3) modeling teachability and being correctable, (4) leading by example, (5) showing modesty, (6) working together for the collective good, (7) empathy and approachability, (8) showing mutual respect and fairness, and (9) mentoring and coaching. The first three dimensions overlap with the most prominent conceptualization of leader-expressed humility in the literature (i.e., Owens et al., 2013). However, the latter six dimensions are unique and represent an expanded understanding of the humble behaviors of leaders, which have implications for leaders and their ethical behavior in organizations. We conducted three studies resulting in two versions of the leader-expressed humility measure: 1) a 27-item scale with the nine dimensions (i.e., the "Leader-Expressed Humility" [LEH] scale) and 2) a 9-item brief scale (i.e., the "Brief LEH" scale) comprised of one item from each of the nine dimensions. As an initial step, we generated a pool of items that reflected each dimension. Next, we validated the LEH and Brief LEH scales in Study 1 and cross-validated the Brief LEH scale in Study 2 with two samples of subordinates in Singapore. As a final step, in Study 3, we cross-validated the Brief LEH scale with a sample of subordinates in the United States.

Keywords Leader humility · Scale development · Leadership · Ethics

Leader-Expressed Humility:

Development and Validation of Scales Based on a Comprehensive Conceptualization

Introduction

As an important component of moral character, humility predicts ethical behavior in the workplace (Cohen & Morse, 2014; Cohen et al., 2014) and is considered a foundational moral virtue necessary for developing other virtues (Wright et al., 2017). Humility keeps leaders grounded in how they view themselves, allowing them to develop in ways that benefit the collective (Li, 2016). Further, because humility emphasizes low self-focus and high other-focus, it is an active ingredient in treating others ethically (Wright et al., 2017). Leader humility enables groups to perform better and addresses complex and morally ambiguous business problems (Argandoña, 2015; Chiu et al., 2016; Owens & Hekman, 2012). Humble leaders tend to employ "a stance of egalitarianism rather than superiority or servility in their communications with others" (Morris et al., 2005, p. 1341). This creates a context in which subordinates feel psychologically safe (Hu et al., 2018), are motivated to engage in behaviors that improve work processes (Bharanitharan et al., 2019), and experience better well-being (Oc et al., 2020). More generally, leader humility relates to a variety of positive, ethical outcomes such as employee citizenship (e.g., Cho et al., 2021), prosociality (e.g., Carnevale et al., 2019), and ethical behaviors (e.g., Naseer et al., 2020). Thus, acting with humility is a fundamental part of how an effective, moral leader behaves (Argandoña, 2015; Frostenson, 2016).

Despite its theoretical and practical importance, humility received scant research attention in leadership research until the development of the first leader humility scale by Owens and colleagues (Owens & Hekman, 2012; Owens et al., 2013). These authors identified three dimensions of leader-expressed humility, including (1) a manifested willingness to see oneself accurately, (2) a displayed appreciation of others' contributions and strengths, and (3) teachability or the willingness to learn and accept feedback. This

foundational work was a much-needed catalyst for increased research on this topic. However, Oc et al. (2015) argued that the dominant conceptualization of leader humility (Owens & Hekman, 2012; Owens et al., 2013) were missing key elements of humility identified in other non-management and adjacent literatures including philosophy and religion (see also Van Tongeren et al., 2019; Van Tongeren et al., 2023; Wright et al., 2017). We argue that these missing elements have implications for understanding leaders and their ethical behavior in organizations (Van Tongeren et al., 2023; Wright et al., 2017).

Owens and Hekman (2012) initially used a qualitative, inductive analysis of interviews with leaders to conceptualize leader humility and derive its dimensions. However, the sample used to develop their framework was male dominated (84% male), long-tenured (average of over 17 years), and comprised of leaders in highly hierarchical organizational structures (e.g., military, finance, religion) with centralized decision making. Further, 31% of the sample were leaders from one mortgage banking firm in the northwestern United States. Thus, the conceptual definition and ultimately the operationalization of leader-expressed humility was based on leaders with a restricted set of characteristics. As such, there may be questions about the comprehensiveness and generalizability of the leader humility framework that emerged.

Owens et al. (2013) later introduced the first leader-expressed humility scale. Using a deductive approach, they focused their conceptual review of the literature on articles published (a) in the prior *10 years*, (b) in psychology or organizational behavior outlets, and (c) where the primary goal was to define humility. However, this set of criteria did not incorporate the long history of work on humility in other disciplines, such as philosophy and religion (e.g., Richards, 1988; Roth, 1973). In fact, Owens et al. (2013, p. 1519) recognized this and stated that the authors "differentiate [their] social conceptualization of humility from the more […] *philosophical* approaches to humility." We argue that this relatively narrow focus excluding philosophical and religious views of humility from consideration may have

omitted other conceptually relevant behavioral dimensions of leader-expressed humility. In short, a broader set of facets of expressed humility may exist in leaders than was conceptualized by Owens and colleagues.

Research on leader humility is still in its infancy, and as with any new construct, there is the need to explore its underlying complexity. Just as research on leadership has expanded over the years to build on and refine various leadership theories and concepts (Dinh et al., 2014), research on leader humility has expanded on the pioneering work of Owens et al. (2013). For instance, Ou et al. (2014) introduced a conceptualization of leader humility that included Owens et al.'s (2013) three behavioral dimensions and added three new motivational and cognitive dimensions: (1) low self-focus, (2) self-transcendent pursuit, and (3) transcendent self-concept.

In another attempt to more fully understand the concept of leader humility, Oc and colleagues (2015) used qualitative methods, with larger and more diverse samples than past work in terms of position, occupation, industry, and gender (see Tables 2 and 3 of Oc et al. [2015]). Oc et al. (2015) started by conducting 25 semi-structured interviews with working professionals until they reached "the point of theoretical saturation (Strauss & Corbin, 1998), the point at which additional interviews do not add any new information" (p. 72). Their initial analysis identified nine categories of humble leader behaviors. Oc et al. then sought to replicate the interview results with an open-ended questionnaire administered to 307 supervisors. Results revealed that the nine dimensions generalized to this new group of supervisors. Of these nine dimensions, three were the same as those identified by Owens et al. (2013; i.e., having an accurate view of self, recognizing follower strengths and achievements, and modeling teachability and being correctable) and six were new, including: (1) leading by example, (2) showing modesty, (3) working together for the collective good, (4) empathy and approachability, (5) showing mutual respect and fairness, and (6) mentoring and coaching. These additional six dimensions of Oc et al. (2015) align with humility

research suggesting that leader-expressed humility extends beyond Owens et al.'s (2013) three dimensions (Van Tongeren et al., 2023; Wright et al., 2017). These additional six dimensions also align with philosophical and religious perspectives of humility which assert that humble individuals recognize that there is larger reality than oneself (e.g., the universe) and that others' interests, needs, and concerns are legitimate. Thus, humble leaders consider subordinates' interests and needs to be at least as important as their own and see the two as intertwined (Nielsen & Marrone, 2018; Wright et al., 2017). According to this perspective, humble leaders judge their self-importance vis-à-vis universal truths and moral laws (Greenberg, 2005; Morris et al., 2005) as well as the needs of the larger group to which they belong, which includes subordinates who depend on them (Peterson and Seligman, 2004; Tangney, 2002). Table 1 in the Online Supplement provides a summary of the nine dimensions from Oc et al., including their definitions and ethical elements.

The nine dimensions observed in Oc et al. (2015) (including the three that overlap with Owens et al. [2013]) align well with prominent philosophical and religious traditions from around the world and throughout the ages[1], (see Table 2 in the Online Supplement). For instance, the *showing modesty* dimension of humility of Oc et al. (2015) is an important virtue and related to humility in almost every philosophical and religious tradition. Showing modesty by letting go of worldly materials (in Buddhist and Sikh perspectives), relinquishing arrogance (in Islamic, Judaic, and Confucian perspectives), and letting go of the self (in Hindu and Taoist perspectives) is discussed in conjunction with humility in these teachings. Consistent with these ideas, the Oc et al. (2015) framework defines this dimension of leader humility as those who do not seek status, personal recognition, or attention.

The *working together for the collective good* and *showing mutual respect and fairness* dimensions identified in Oc et al. (2015) are also prominent in many philosophical and religious perspectives including Christianity, Hinduism, Taoism, and Confucianism. In these traditions, humble individuals are thought to deemphasize the self in favor of working with

others to benefit the collective and to be a part of some greater good. For example, Lao Tzu, the founder of Taoism, argues that: "All streams flow to the sea because it is lower than they are. Humility gives it its power. If you want to govern the people, you must place yourself below them. …" (Chapter 66). In addition, humble individuals emphasize that they are no better than others and strive to treat others equally with respect, compassion, and justice. Evidence of the *showing mutual respect and fairness* dimension can be seen for example in the writings of Augustine, "wherever there is humility there is also charity" (Morris et al., 2005, p. 1329).

Finally, whereas the *leading by example, empathy and approachability* and *mentoring and coaching* dimensions emerge prominently in Eastern philosophical and religious traditions, elements of these concepts also can be found in Western traditions. According to Christian, Sikh, Taoist, and Confucian perspectives, humility involves letting go of power and status differences and embracing opportunities to be helpful and available to others. Humble leaders realize their responsibility to act as they would expect others to act (i.e., holding themselves to the same standards they expect of others), which requires that they behave appropriately toward subordinates. This belief translates into leading by example. By removing the barriers created by power and status differences, humble leaders become more approachable and empathetic. Finally, humble individuals believe that others deserve to not only be empowered, but also shown compassion and love. These beliefs are enacted by leaders through coaching and mentoring. Taken together, there is evidence that the humility dimensions observed by Oc et al. (2015) have a foundation in universal human virtues recognized through the ages by philosophical and religious traditions throughout the world. Table 2 in the Online Supplement elaborates on the connections between these humility dimensions and traditional philosophical and religious teachings.

In the current research, we follow the more expansive and inclusive view of leader humility observed by Oc et al. (2015). We develop and validate two versions of the leader-

expressed humility measure: 1) a 27-item dimensional scale (i.e., the "Leader-Expressed Humility" [LEH] scale) consisting of the nine dimensions identified by Oc et al. and 2) a 9-item brief scale (i.e., the "Brief LEH" scale) of leader-expressed humility. Given that self-reported humility is subject to self-enhancement bias (Tangney, 2000), both scales are validated for subordinate ratings.

These scales make three contributions to the leader humility and business ethics literatures. First, these scales are based on an expanded and theoretically rich conceptualization of leader-expressed humility that aligns with both management theory as well as prominent philosophical and religious traditions. In addition, our LEH scale provides leadership researchers with three-item measures of each of the nine dimensions so that they can separately examine the effects of distinct humility dimensions in predicting outcomes. The Brief LEH scale is practically useful, especially when an overall assessment of leader-expressed humility is desired. Second, we contribute to the business ethics literature by aligning the nine dimensions of Oc et al. (upon which the current scales are based) with theory and insight from traditional, ethically-grounded philosophical and religious teachings. Third, we theorize (and empirically demonstrate) how leader-expressed humility predicts important outcomes, including subordinate perceptions of relationship quality (i.e., trust in and liking for the leader) and leader job performance, controlling for leader integrity (another important ethics-related leadership construct). We also demonstrate that our overall humility scale explains incremental variance (with magnitudes close to or over 10% for many criteria, amounts deemed to be substantial in previous research, e.g., Mount et al., 2000; Uggerslev et al., 2012) in both leader and subordinate outcomes beyond existing leader humility scales (i.e., Owens et al., 2013; Ou et al., 2014) across samples. Thus, we provide researchers and practitioners with updated and theoretically broader valid measures of leader-expressed humility.

Overview of Studies

We conducted three studies to develop our LEH and Brief LEH scales. In Study 1 we started with 54 items and reduced the number to 27 items for the LEH scale (i.e., three items for each of the nine dimensions) and 9 items for the brief scale (i.e., one item representing each of the nine dimensions). We then assessed the reliability and validity of these scales with a sample of subordinates in Singapore. In Study 2, we used a sample of subordinates in Singapore to cross-validate and assess the reliability and validity of the Brief LEH scale. In Study 3, we used a sample of subordinates in the United States to assess the reliability and validity of the Brief LEH scale. We also examined the incremental validity of the Brief LEH scale above leader integrity as well as Owens et al. and Ou et al. humility scales examined in Studies 1, 2, and 3. See Table 1 for additional information for each study.

Analytic Strategy

We used Mplus (Muthén & Muthén, 1998–2017) to investigate factor structure and item performance in all three studies. Several indicators of model fit were examined, including (a) the χ^2 Goodness of Fit statistic, (b) the Tucker Lewis Index (TLI), (c) the root mean square error of approximation (RMSEA), (d) the standardized root mean square residual (SRMR), and (e) the comparative fit index (CFI). Consistent with recommendations in previous research, a model is considered to have a satisfactory fit if (a) its $\chi 2$/df ratio is below 3 (Kline, 2005), (b) CFI and TLI values are above .95 (Hu & Bentler, 1999), (c) SRMR is less than 0.08 (Hu & Bentler, 1999; MacCallum et al., 1996), (d) RMSEA values are at or below .10 (MacCallum et al., 1996).

We employed the weighted least squares means and variance adjusted (WLSMV) estimator for all CFAs. According to Finney and DiStefano (2006), WLSMV estimator is more robust than maximum likelihood in that it does not require the assumption of normally distributed and continuous data and therefore is suitable for Likert-type data which are

discrete and tend to be not normally distributed by nature (Finney & DiStefano, 2006). This is especially true when the response scale includes five or fewer response options and the data are skewed (which is common when the underlying construct being evaluated is positive). Given that our leader humility scales employed a 5-point scale (1 = "strongly disagree" to 5 = "strongly agree"), we followed the recommendation of Finney and DiStefano (2006) and used WLSMV estimator for all CFAs.

Study 1: Item Generation and Validation of the LEH and Brief LEH Scales

In Study 1, we developed subordinate-rated leader humility scales. First, we generated six items for each of the nine dimensions identified by Oc et al. (2015), resulting in 54 items. Second, we performed CFAs with the 54 items with the goal of reducing the number of items to three per dimension for a total of 27 items. Using these 27 items, we confirmed the 9-dimension structure of leader-expressed humility (Oc et al., 2015) and verified that these dimensions loaded on a second-order overall humility factor. Third, we performed a CFA using one item per dimension to assess a brief, global 9-item leader-expressed humility scale. Finally, we evaluated the nomological network (e.g., convergent and discriminant validity) of the LEH and Brief LEH scales and established their criterion-related and incremental validity.

Item Generation and Refinement

To develop our measures of leader-expressed humility, we followed best practices outlined by Hinkin (1995), which include generating and retaining content valid items, examining the scale's factor structure and item performance, and demonstrating convergent, discriminant, and criterion-related validity of the new scales. Using the theoretical conceptualization observed in Oc et al.'s (2015) work on humble leader behaviors, five members of the author team who have expertise in leadership research wrote behavioral items that 1) were precise and simple, 2) were not double-barreled, and 3) were not leading (Hinkin, 1995). This

process resulted in an initial pool of 83 items, ranging from 7 to 13 items for each of the nine dimensions. Across numerous iterations, the same five authors met to discuss the items, refine them, and reduce them to ensure content validity. These meetings happened shortly after deriving the initial item pool (Hinkin, 1995). The steps above resulted in a final item pool that contained 6 items for each of the 9 dimensions. See Table 3 in the Online Supplement for the complete list of the 54 items.

Sample and Procedure

Survey invitations were sent to 2,164 full-time working adults in Singapore that had previously participated in studies conducted by the author team. Respondents were emailed invitations including the survey link and were asked to complete the survey within one week. As an incentive, respondents could choose among the following options (a) be paid S$5, (b) receive one entry into a drawing for S$100, where there was one S$100 prize for every 20 respondents choosing this option, (c) donate S$5 to one of several charities (e.g., Singapore Red Cross, Food from the Heart), or (d) decline the incentive.

Of the 2,164 individuals invited to participate in the study, 473 participated in the survey (21.86% response rate) and had unique direct supervisors. The survey included two attention check items. Of the 473 who participated in the survey, 81 (17.12% of respondents who responded) failed at least one attention item.[2] Hence, we omitted these respondents from the analyses as they represent threats to the internal validity of the study (Tye-Williams, 2018). Our final sample included 370 respondents (17.10% useable response rate).[3] See Table 4 in the Online Supplement for the summary of demographic characteristics of the final sample.

Measures

Respondents completed the 54 leader humility items. To assess the nomological network of the scale, they completed Owens et al.'s (2013; α = .93) and Ou et al.'s (2014; α = .93) leader humility scales for convergent validity. We also asked respondents to assess their leaders' arrogance (11-item scale, Johnson et al., 2010; α = .94) and openness to experience (8-item scale, Saucier, 1994; α = .80) to examine discriminant validity. In addition, respondents rated their leaders' job performance (3-item scale, Motowidlo & Van Scotter, 1994; α = .85) to assess criterion-related validity of the scales, including whether our new measures added incremental prediction beyond established measures. All items were measured on a 5-point scale. Finally, respondents provided demographic information.

Results

Confirmatory Factor Analysis

As an initial step, we conducted a confirmatory factor analysis (CFA) of the full 54 item set, which included six items for each of the nine dimensions. Both the 9-factor structure and 9-factor structure with a second-order factor fit the data well. The second-order factor loadings for all nine dimensions were positive and high. See Table 3 in the Online Supplement for the 54-item set and see Appendix A in the Online Supplement for the results.

From these models, we sought to reduce the survey length by selecting three items per dimension using a combination of considerations including: (a) item wording clearly tapped the core aspect of the dimension definition, (b) the item had a high factor loading, and (c) the corrected item-total correlation was high. Table 2 lists all 27 items.

We conducted a CFA on the LEH scale and found support for the 9-factor structure (χ^2 = 555.40, *df* = 288, $p < .001$; χ^2/df ratio = 1.93; RMSEA = .05; SRMR = .03; TLI = .99; CFI = .99). Further, this 9-factor structure fit significantly better than all other more parsimonious structures (see Table 5 in the Online Supplement for alternative models). Both

the factor loadings (see "1st order factor" column in Table 2) and the scale internal consistency reliabilities (see Table 6 in the Online Supplement) were high. These results indicate the nine dimensions are reliably measured with three items per dimension.

We also specified a model in which the nine first-order humility dimensions loaded onto a second-order humility dimension. The fit statistics of the second-order model indicated good fit with the data (χ^2 = 577.02, *df* = 315, $p < .001$; χ^2/df ratio = 1.83; RMSEA = .05; SRMR = .03; TLI = .99; CFI = .99).[4] In addition, the second-order factor loadings for all the dimensions were high (see the loadings in **bold** in Table 2). These results suggest that these dimensions (a total of 27 items) may be combined into a composite scale (the internal consistency reliability for such a scale is $\alpha = .97$). Thus, the results provide empirical support for the second-order factor of the nine dimensions of leader humility.

The Brief LEH Scale. Recognizing that there may be interest in both a multidimensional conceptualization of leader-expressed humility (e.g., when making predictions about how different aspects of humility may relate to different antecedents or outcomes) as well as a shorter measure of overall leader-expressed humility (e.g., when the general humility construct is of interest to researchers and/or survey space is limited), we further reduced the LEH (27-item) scale to a brief 9-item measure by selecting one item from each dimension using the same three considerations listed above: (a) the item wording tapped the core aspect of the underlying dimension definition, (b) the item had the highest average loading across the 54 and 27 item sets, and (c) the corrected item-total correlation was high.

The fit statistics of the 1-factor model indicated good fit with the data (χ^2 = 70.91, *df* = 27, $p < .001$; χ^2/df ratio = 2.63; RMSEA = .07; SRMR = .02; TLI = .99; CFI = .99), all items had high loadings ranging from .66 to .88, and the scale had a high internal consistency reliability estimate of .91 (see Table 7 in the Online Supplement).

Nomological Network Analysis

Convergent Validity. Convergent validity was assessed by correlating the LEH scale and the Brief LEH scale with two existing scales of leader humility: Owens et al.'s (2013) scale and Ou et al.'s (2014) scale (which includes Owens et al.'s scale and ten additional new items). Results indicated that our overall LEH scale significantly correlated with Owens et al.'s scale (r = .86) and with Ou et al.'s scale (r = .85) (see Table 6 in the Online Supplement). The Brief LEH scale also significantly correlated with Owens et al.'s scale (r = .85) and with Ou et al.'s scale (r = .83) (see Table 8 in the Online Supplement). These results provide evidence of convergent validity for the developed scales.

Distinctiveness from Arrogance and Openness to Experience. In an effort to provide evidence for empirical distinctiveness of the LEH and Brief LEH scales with leader arrogance and openness to experience, we performed CFAs of these constructs. Owens et al. (2013) suggested that arrogance is a characteristic of narcissists and is in contrast with humility. Owens et al. (2013) also suggested that openness to experience and humility are related but distinct: While a humble individual is open to others' feedback, openness to experience refers to how the individual is open to new experience and information in general and has little to do with how receptive an individual is to others' feedback.

We conducted chi-square difference tests (Mplus DIFFTEST options) with WLSMV estimator to examine if our leader-expressed humility scales are distinct from the examined constructs. For the LEH scale, we conducted chi-square difference tests comparing a 10-factor model with a series of 9-factor models in which we combined each of the nine leader-expressed humility dimensions with leader arrogance or openness to experience. We also conducted chi-square difference tests comparing a 2-factor model (i.e., the LEH scale and leader arrogance, the LEH scale and openness to experience) with a 1-factor model (i.e., combining the LEH scale with leader arrogance or openness to experience). All chi-square difference tests were significant, in support of our predicted factor structure (p < .001). For

the Brief LEH scale, we followed the same procedure comparing a 2-factor model with a 1-factor model. All chi-square difference tests were again significant ($p < .001$) for both leader arrogance and openness to experience, indicating that they are distinct constructs.

Criterion-Related Validity and Incremental Prediction

To assess criterion-related validity, we used subordinates' ratings of their leaders' job performance as the dependent variable. Past research has positively associated expressed humility with job performance (Owen et al., 2013). Results from our analyses are presented in Table 8 in the Online Supplement. All correlations were significant in the expected directions ($p < .001$). These results provide criterion-related validity evidence for the LEH and Brief LEH scales.

Next, we examined whether our scales incrementally predict leader job performance after controlling for the Owens et al. (2013) humility scale, Ou et al. (2014) humility scale, leader arrogance, or leader openness to experience.[5] Results indicated that our Brief LEH scale (see Table 3) and LEH scale (see Table 4) incrementally predicted ratings of leader job performance beyond the Owens et al. measure and the Ou et al. (2014) measure. In addition, our Brief LEH scale (Table 3) and the LEH scale (Table 4) incrementally predicted performance beyond leader arrogance or leader openness to experience. These results demonstrate that our newly developed LEH and Brief LEH scales explain substantial incremental variance in leader job performance beyond existing scales of leader humility and other relevant characteristics.

The results above provide initial validity evidence for our LEH scale and Brief LEH scale of leader-expressed humility. CFA analyses indicated good fit for the LEH and Brief LEH scales. The LEH and Brief LEH scales predicted leader job performance above Owens et al.'s or Ou et al.'s scale. Further note that the LEH (27-item) and Brief LEH (9-item) scales are rather highly correlated with each other ($r = .98$; see Table 8 in the Online

Supplement). Because the Brief LEH scale has good reliability and validity evidence and may be practically useful for research interested in overall leader-expressed humility, we focused our subsequent efforts on further validating this scale.

Study 2: Cross-Validation of the Brief LEH Scale

There were three purposes of Study 2. First, we performed CFAs to cross-validate our brief scale as rated by subordinates. Second, we assessed convergent validity of our brief scale with other leader humility scales. Finally, to further examine the criterion-related and incremental validity of our brief scale, in Study 2 we included important criteria relevant to individual and team functioning, as well as leader-member relations. Specifically, we focused on subordinates' job satisfaction and promotive and prohibitive voice given their implications for the functioning of teams and the downstream consequences for team and organizational outcomes (e.g., Bashshur & Oc, 2015; Judge et al., 2001). We also focused on subordinates' liking of, and trust in, the leader and leader-member exchange (LMX) as they are key proxies for the quality of leader-member relations and relevant leader(ship) outcomes (Brower et al., 2000).

Sample and Procedure

As part of a voluntary class project, students recruited subordinates that met the study's three inclusion criteria: 1) employed full-time, 2) able to complete surveys online, and 3) fluent in English (the language in which the surveys were administered).

Data were collected with two subordinate online surveys, separated by two weeks. The first survey included the leader humility scales and two attention check items, and the second survey included the outcome variables and one attention check item. Respondents who failed any attention check item were omitted from analyses.

The first survey invitation was sent to 405 subordinates. Of these, 364 subordinates completed the survey (89.88% responses rate). These 364 subordinates were invited to

participate in Survey 2. Three hundred thirty-three participants completed the second survey (82.22% responses rate). Two hundred seventy-five subordinates correctly responded to all attention check items in Survey 1 (67.90% usable responses rate)[2] and a total of 240 subordinates completed both surveys and passed all attention check items (59.26% usable responses rate).[6] See Table 4 in the Online Supplement for the summary of demographic characteristics.

Measures

Subordinates completed the Brief LEH (9-item) measure in which the reference was "my supervisor" (α = .86) in Survey 1. To assess convergent validity of our brief scale, subordinates also completed Owens et al.'s (2013; α = .93) and Ou et al.'s (2014; α = .91) leader humility scales and provided demographic information in Survey 1. In Survey 2, to assess criterion-related validity and incremental predictive validity of our brief scale, subordinates reported their job satisfaction (3-item scale, Cammann et al., 1983; α = .79), liking for the leader (3-item scale, adapted from Wayne & Ferris, 1990; α = .91), LMX (12-item scale, Liden & Maslyn, 1998; α = .90), trust in the leader (10-item scale, Mayer & Gavin, 2005; α = .71), and promotive (5-item scale; α = .90) and prohibitive voice (5-item scale; Liang et al., 2012; α = .84). Respondents responded on a 5-point scale for all the scales mentioned above.

Results

Confirmatory Factor Analyses

The fit statistics of this sample indicated that the 9-item, 1-factor model has good fit: χ^2 = 107.08, *df* = 27, $p < .001$; χ^2/df ratio = 3.97; RMSEA = .11; SRMR = .04; TLI = .96; CFI = .97.[7] All nine items had factor loadings ranging from .49 to .84. See Table 7 in the Online Supplement for the summary of the results.

Convergent Validity

As in Study 1, the Brief LEH scale correlated highly with Owens et al.'s scale (r = .83, p < .001) and with Ou et al.'s scale (r = .79, p < .001). See Table 10 in the Online Supplement for the summary of results.

Criterion-Related Validity

To provide an expanded test of criterion-related validity (beyond leader job performance assessed in Study 1), we examined subordinate and relational outcomes in Study 2. We expected leader humility to positively relate to subordinate job satisfaction, voice, LMX, leader liking, and trust in the leader.

All results for the Brief LEH scale were consistent with our predictions. Leader-expressed humility significantly correlated with job satisfaction (r = .44, p < .001), leader liking (r = .46, p < .001), LMX (r = .68, p < .001), trust in the leader (r = .51, p < .001), promotive voice (r = .40, p < .001), and prohibitive voice (r = .15, p = .02). See Table 10 in the Online Supplement.

Incremental Validity

We tested the incremental validity of the 9-item scale. Except for prohibitive voice, the Brief LEH scale predicted all examined criteria above the Owens et al. (2013) or Ou et al. (2014) scales with changes in R^2 ranging from .03 to .09.[5] See Table 5 (Owens et al.) and Table 6 (Ou et al.) for the full results.

Study 3: Validation of the Brief LEH Scale with An American Sample

We conducted Study 3 with a sample of subordinates in the United States which is higher in uncertainty avoidance, lower in power distance, and lower in collectivism than Singapore (Hofstede, 2001). Study 3 allows us to examine the psychometric properties of the Brief LEH

scale in a very different culture as an initial step to assessing its generalizability across cultures. Similar to our prior studies, we evaluated the incremental validity of the brief scale beyond the Owens et al. (2013) and Ou et al. (2014) scales, but as explained below, we also added leader integrity as a predictor in this study. In terms of outcomes, as in Studies 1 and 2 we assessed leader job performance, liking for the leader, and trust in the leader. We again expected our leader-expressed humility scale to predict incremental variance in these criteria above and beyond the Owens et al. (2013) or Ou et al. (2014) scale because 1) our scale is based on a broader conceptualization of leader humility with the six unique dimensions and 2) the results of Studies 1 and 2 provide initial support for this idea.

Incremental Validity of Leader Humility above Leader Integrity

Leaders with high integrity are known for consistency between their words and actions (Dineen et al., 2006). Such consistency is important for interpersonal trust and high-quality relationships among leaders and subordinates (e.g., Moorman et al., 2013), and integrity (along with ability and benevolence) is one of the three foundational elements of interpersonal trust (Mayer et al., 1995). Integrity, like humility, is seen as a virtue that is a component of moral character.

However, we expect leader humility to account for incremental variance in the quality of leader-member relations (i.e., trust, liking) and leader job performance beyond the effect of leader integrity for two reasons. First, while humble leaders are likely to be seen to have integrity because they treat their subordinates with fairness and respect, humble leaders also act with benevolence towards subordinates (i.e., working with them for the collective good, mentoring them), which should incrementally predict more positive leader-member relations and downstream, better performance.

Second, although leader integrity may facilitate better performance because leaders are more likely to be trusted and supported by others, those same leaders may not necessarily

learn and grow from past mistakes, a hallmark of leader humility (Owens & Hekman, 2012). This ability to learn and grow should also lead to improved leader-member relations. Taken together, we argue that subordinates will likely develop high-quality relationships with leaders who express humility and evaluate their job performance favorably (above and beyond the effect of leader integrity).

Sample and Procedure

We used Qualtrics International Inc. (Qualtrics) to collect data from full-time working adults in various organizations in the United States. The respondents were panel members of Qualtrics. The respondents participated in two online surveys, separated by two weeks. Each survey included three attention check items.

We initially contacted 1,304 subordinates. Screening questions that appeared at the start of Survey 1 were used to determine whether potential respondents held a full-time position, had a direct supervisor, frequently interacted with the supervisor, and were not expected to change their supervisor or job within the next two weeks. 600 respondents passed the screening questions at the beginning of Survey 1. Out of these 600 respondents, 450 successfully completed Survey 1 and did not fail at any attention check questions (75.00% useable response rate) and were invited to participate in Survey 2.

Out of 450 respondents[8], 78 respondents did not participate in Survey 2, 53 respondents did not pass screening questions at the beginning of the survey (which asked them to indicate whether they remembered whom they had referred to as their supervisor in Survey 1 and whether they still worked under the same supervisor), and 27 respondents incorrectly answered one or more attention check items[2]. Thus, the final sample size is 292 subordinates (48.67% useable response rate). See Table 4 in the Online Supplement for the summary of demographic characteristics of the sample.

Measures

The subordinates completed our Brief LEH (9-item) scale (α = .94) in Survey 1. To assess incremental criterion-related validity of the scale, respondents also completed Owens et al.'s (2013; α = .96) and Ou et al.'s (2014; α = .96) leader humility scales, assessed their leaders' integrity (4-item scale; Dineen et al., 2006; α = .90), and reported demographic information in Survey 1. In the second survey, subordinates rated their leaders' job performance (α = .92), liking for the leader (α = .91) and trust in the leader (α = .83) using the same scales used in Studies 1 and 2. All items were rated on a 5-point scale.

Results

Confirmatory Factor Analysis

The fit statistics of this sample indicated that the 9-item, 1-factor model fit the data well: χ^2 = 69.23, df = 27, $p < .001$; χ^2/df ratio = 2.56; RMSEA = .07; SRMR = .02; TLI = 0.995; CFI = 0.996. All factor loadings were .65 or above. The results confirm the 1-factor structure of the Brief LEH scale in a new cultural context. See Table 7 in the Online Supplement for the results.

Incremental Validity

The Brief LEH scale incrementally predicted leader job performance, liking for the leader, and trust in the leader above Owens et al.'s scale or Ou et al.'s scale with changes in R^2 ranging from .06 to .09.[5] See Table 12 in the Online Supplement for the correlations among the variables. See Table 7 (Owens et al.) and Table 8 (Ou et al.) for the summaries of the results.

As predicted, the Brief LEH scale incrementally predicted leader job performance ($p < .001$, $\Delta R^2 = .23$), liking for the leader ($p < .001$, $\Delta R^2 = .26$), and trust in the leader ($p < .001$, $\Delta R^2 = .20$) beyond leader intergrity[5]. See Table 9 for the summaries of the results.

General Discussion

We introduce a new set of leader-expressed humility scales developed from a theoretically rich conceptualization of humility; one that is more firmly rooted in the historical and philosophical accounts of humility and that is derived from a large set of interviews and open-ended responses. Building on the work of Oc et al. (2015), Owens et al. (2013), and Ou et al. (2014), we introduced and validated two versions of the leader-expressed humility measure: the LEH scale (i.e., a 27-item scale) measuring all nine dimensions and the Brief LEH scale (i.e., a 9-item, overall scale) that includes one item from each dimension. We provided empirical support for the broader, 9-dimensional structure of leader-expressed humility, which includes the three dimensions found in Owens et al. (2013) as well as the six additional dimensions identified by Oc et al. (2015). These nine dimensions reflect the idea that humble leaders consider subordinates' interests, needs, and concerns to be as legitimate as theirs and that they are part of a larger group which is more important than the leaders themselves.

Contributions

The burgeoning research on leader humility in the past decade has relied heavily on Owens et al.'s (2013) scale to study the effect of leader humility in organizations. However, recent research (e.g., Oc et al., 2015; Van Tongeren et al., 2023; Wright et al., 2017) indicates that leader humility is a theoretically richer construct which extends beyond the most prominent conceptualization in the literature (i.e., Owens et al., 2013). We sought to address this issue in the current research by making three critical contributions to the study of leader humility. First, drawing from Oc et al.'s (2015) conceptualization of leader-expressed humility, our research makes available two leader-expressed humility scales that take an expansive view of leader humility by including additional dimensions that are consistent with traditional religious and philosophical views. These additional dimensions align with growing research suggesting that leader-expressed humility extends beyond Owens et al.'s three dimensions

(e.g., Oc et al., 2015; Van Tongeren et al., 2023; Wright et al., 2017). Although the work based on Owens et al.'s scale has been invaluable in deepening our understanding of leader humility, the omission of a broader knowledge base that builds on the richness of the diverse philosophical and religious views of humility results in what we believe to be an overly narrow definition. The LEH and Brief LEH scales represent nine dimensions, six of which are unique to the Owens et al. and Ou et al. scales: (1) leading by example, (2) showing modesty, (3) working together for the collective good, (4) empathy and approachability, (5) showing mutual respect and fairness, and (6) mentoring and coaching. Thus, we introduce a set of tools that leadership scholars and practitioners can use to study both overall leader-expressed humility as well as specific dimensions of leader-expressed humility.

Second, we contribute to the business ethics literature by conceptualizing humility as a moral virtue of leaders (e.g., recognizing oneself as not being more privileged than others, considering others' interests and needs to be legitimate; Wright et al., 2017) commensurate with traditional philosophical and religious thinking. We illustrate clear theoretical connections between the nine dimensions of leader-expressed humility and humility teachings of traditional philosophies and religions. We also theorize and empirically show that leader-expressed humility is related to improved subordinate relationship quality (i.e., trust in the leader and liking for the leader) and leader job performance above and beyond the effect of another ethics-related leader quality (i.e., integrity).

Lastly, our newly developed Brief LEH scale is a comprehensive and valid measure of leader-expressed humility that is broadly applicable to the study of leader humility. This brief scale also predicts various leader (e.g., leaders' job performance), subordinate (e.g., job satisfaction), and relational outcomes (e.g., trust in the leader) beyond the Owens et al. and Ou et al. scales, across two different cultures.

Future Research and Limitations

As in all research, ours is not without limitations. First, we developed our scales based on research conducted inductively in one nation (i.e., Singapore, Oc et al., 2015) and validated our scales with both Singaporean and U.S. samples. We believe that Singapore, a diverse nation embracing many religions and influenced by different philosophical traditions (e.g., Buddhism, Christianity, Islam, Judaism, Sikhism, Taoism), is a useful context to conceptualize leader humility that can be generalized to many other contexts. Indeed, our results from Study 3 conducted with a U.S. sample support this notion. Future research could assess the validity of our scales as well as inductively cross-validate Oc et al.'s conceptualization of leader-expressed humility in other cultural settings.

Second, a procedural limitation of the current research is that during the process of generating items for our scales, the same leadership experts wrote and evaluated the items. While our item generation procedure followed best practices outlined by Hinkin (1995), we acknowledge that it may have been desirable to use different experts to write the items and subsequently evaluate the items. Although a potential limitation, the evidence from the presented studies indicates these scales are reliable and valid measures of leader-expressed humility. Nonetheless, future work can continue to evaluate and potentially further refine the items.

Third, future research should examine how effects of leader-expressed humility on employees and organizations are unique from those of other positive forms of leadership styles. Although leader-expressed humility has aspects that are conceptually similar to other leadership styles, including ethical leadership, servant leadership, authentic leadership, and responsible leadership, we suggest that on the whole, leader-expressed humility is conceptually distinct from these other leadership styles and worth investigating in its own right. For instance, although both humble leaders and ethical leaders (Brown et al., 2005) show respect and fairness to subordinates and lead their subordinates by example, other humble leader behaviors such as showing modesty or mentoring and coaching are not part of

the conceptualization of ethical leadership. Similarly, because servant leaders put the interests of others ahead of their own interests (Liden et al., 2015), they tend to express empathy toward subordinates and are willing to coach them (Liden et al., 2015; Oc et al., 2015). However, as opposed to humble leaders, servant leaders are not necessarily modest nor teachable. Both humble and responsible leaders (e.g., Stahl & Sully de Luque, 2014) work for the collective good, but only humble leaders are necessarily modest in their approach. Indeed, we often see socially responsible leaders in the media seemingly enjoying the public attention they receive for their positive behavior. Finally, although humble leaders and authentic leaders share high levels of self-awareness and unbiased self-evaluations (Walumbwa et al. 2008), authentic leaders do not necessarily coach subordinates in their career development or lead by example. Thus, while leader humility should have some level of overlap with a number of other leadership concepts it is also theoretically distinct. Empirical tests of these distinctions in future research would be valuable.

Fourth, we collected data from a single source (i.e., subordinates), which raises a potential issue of artificially inflated relationships due to common method variance (Podsakoff et al., 2003). Taking steps to address this limitation in our research, we followed the recommendations of Podsakoff et al. (2003) and collected the data for predictors (e.g., leader humility) and criteria (e.g., leader performance) at different time points for the purpose of incremental validity. In Studies 2 and 3, subordinates first rated their leader's humility and then two weeks later responded to questions measuring the dependent variables. By doing so, we hoped to minimize the potential issue of common method variance.

Fifth, future research could examine the degree of (dis)agreement between self-reported and other-reported leader-expressed humility and the implications of the (dis)agreement for understanding relational, well-being, and effectiveness outcomes.

Practical Implications

This research provides practitioners with a tool to assess leader humility and to inform interventions for developing more humble leaders within their organizations (e.g., Bashshur et al., 2016). Our research suggests that effective leader humility training should be designed to improve not only the behaviors represented by the three prominent dimensions of leader-expressed humility in the literature, but also the six additional dimensions of Oc et al. (2015): (1) leading by example, (2) working together for the collective good, (3) showing modesty, (4) empathy and approachability, (5) showing mutual respect and fairness, and (6) mentoring and coaching. Indeed, even the best leaders might not express behaviors across all the nine dimensions and might still improve in areas in which they have shortcomings. Depending on organizational resources and leaders' needs, organizations can tailor training programs to improve overall humility as well as specific dimensions of humility. For instance, leaders with strengths in certain dimensions (e.g., having an accurate view of self) can be given a training program specifically aimed at strengthening other dimensions (e.g., mentoring and coaching). Such efforts to enhance leader humility should help foster a more supportive and ethical organizational environment.

Supplementary Information Data are available upon request. The Online Supplement is available at https://osf.io/v93p2/?view_only=1911ff0a480f4cc4a583ef88235fd077.

Notes

1. Here we focus on several philosophical and religious traditions that are historically and culturally influential. Of course, this is not an exhaustive list. It rather offers a sample of how different philosophies and religions practiced today discuss and relate to humility.

2. The percentages of respondents failing an attention check question in our studies ranged from 8.46% to 25.00%, which is not uncommon for heterogeneous samples of respondents completing an online, voluntary survey (Shamon & Berning, 2020).

3. Analyses indicated that the final sample of respondents (N = 370) did not differ from respondents dropped from the analysis (N = 103) in term of their demographics (i.e., age, gender, ethnicity, organizational tenure, position level, and work experience; ps > .05), except for tenure with their supervisor (p < .01).

4. A chi-square difference test (Mplus DIFFTEST option) showed that the first-order 9-factor model fit significantly better than the second-order factor model: $\Delta\chi^2$ (27) = 63.54, p < .001). Thus, the results suggest that leader humility is a multidimensional construct.

5. See Tables 9 (Study 1), 11 (Study 2), and 13 (Study 3) in the Online Supplement for results of CFAs and chi-square difference tests comparing the 3-factor models and nested models.

6. The final sample (N = 240) did not differ from respondents dropped from the analysis (N = 124) in terms of their demographics reported in Table 4 in the Online Supplement (ps > .05).

7. While CFI, TLI, and SRMR indicated good fit, RMSEA was marginally above the cut-off point of .10. Nevertheless, past research using computer simulations (Chen et al., 2008) showed that RMSEA values tend to be inflated for less complex models. Given the 1-factor model, it may not be surprising to see the RMSEA value of .11.

8. The final sample of respondents (N = 292) did not differ from respondents dropped from the analysis (N = 158) in term of their demographics (i.e., age, gender, ethnicity, tenure with their supervisor, organizational tenure, and position level; ps > .05), except for work experience (p < .05).

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Table 1 Overview of studies and analyses performed

		Study 1 (Singapore)		Study 2 (Singapore)	Study 3 (The U.S.)
	54 items	LEH (27-item) scale	Brief LEH (9-item) scale	Brief LEH (9-item) scale	Brief LEH (9-item) scale
Item generation	✓				
Item reduction	✓	✓			
CFAs	✓	✓	✓	✓	✓
Scale reliability		✓	✓	✓	✓
Nomological network					
Convergent validity		✓	✓	✓	
Discriminant validity		✓	✓		
Criterion validity		✓	✓	✓	
Incremental validity					
Leader outcome		✓	✓		✓
Subordinate outcomes				✓	
Relational outcomes				✓	✓

LEH stands for Leader-Expressed Humility. The leader outcome is leader job performance. Subordinate outcomes include subordinate job satisfaction and subordinate voice. Relational outcomes include subordinate liking for the leader, subordinate trust in leader, and LMX

Table 2 Confirmatory factor analysis (Study 1)

Leader-Expressed Humility scale	**1st order factor**	**2nd order factor**
My leader …		
Having an accurate view of self	---	**.81**
…knows him or herself well (e.g., limitations, strengths).^	.88	.88
…is self-aware.	.89	.89
…has an accurate view of him/herself.	.77	.77
Recognizing follower strengths and achievements	---	**.86**
…acknowledges others' achievements.	.93	.93
…gives credit where credit is due.	.92	.92
…acknowledges others' contributions.^	.99	.99
Modeling teachability and being correctable	---	**.86**
…tries to learn from others.	.86	.86
…seeks input from others.	.88	.88
…listens to others' suggestions.^	.91	.91
Leading by example	---	**.92**
…shows others the appropriate way to behave.	.81	.81
…is a good example for others to follow.^	.95	.95
…leads by example.	.91	.91
Showing Modesty	---	**.76**
…is arrogant.*	.88	.88
…is boastful.*^	.89	.89
…is modest.	.83	.83
Working together for the collective good	---	**.88**
…is a team player.^	.95	.95
…works together with others to achieve common goals.	.92	.92
…works for the good of the group.	.93	.93
Empathy and approachability	---	**.93**
…understands the thoughts and feelings of others.	.86	.86
…is there for others when they need him/her.	.89	.89
…cares about others.^	.90	.90

Leader-Expressed Humility scale	**1st order factor**	**2nd order factor**
Showing mutual respect and fairness	---	**.90**
…treats others fairly.^	.92	.92
…treats others with dignity.	.93	.93
…is fair when evaluating others.	.92	.92
Mentoring and coaching	---	**.87**
…shares his/her knowledge with others.	.83	.83
…teaches others how to improve.^	.86	.86
…helps others to develop their own skills.	.90	.90
χ^2	555.40†	577.02†
(df)	(288)	(315)
χ^2 /df ratio	1.93	1.83
Root mean square error of approximation (RMSEA)	.05	.05
Standardized root-mean-square residual (SRMR)	.03	.03
Tucker–Lewis index (TLI)	.99	.99
Comparative fit index (CFI)	.99	.99

N = 370. The estimation method was WLSMV estimator. Bolded values are 2nd order factor loadings. All scales were rated by subordinates. Factor loadings of the 1st order factor model and the 2nd order factor model appear equal due to rounding

^ Indicates that the item was retained for the Brief LEH (9-item) scale; * indicates that the item was reverse-coded; items were selected based on the factor loadings, item total correlations, and item content

† $p < .001$

Table 3 Incremental validity of the Brief Leader-Expressed Humility (Brief LEH) scale above and beyond Owens et al.'s (2013) and Ou et al.'s (2014) leader humility scales, leader arrogance, and leader openness to experience (Study 1)

	Leader job performance							
	Step 1 *B* (*SE*)	Step 2 *B* (*SE*)	Step 1 *B* (*SE*)	Step 2 *B* (*SE*)	Step 1 *B* (*SE*)	Step 2 *B* (*SE*)	Step 1 *B* (*SE*)	Step 2 *B* (*SE*)
Constant	.83** (.24)	.23 (.22)	.67* (.26)	.29 (.23)	5.15† (.13)	.15 (.43)	1.35† (.25)	-.23 (.23)
Leader humility (Owens et al.)	.80† (.06)	-.11 (.10)						
Leader humility (Ou et al.)			.88† (.07)	-.15 (.11)				
Leader arrogance					-.58† (.05)	.00 (.07)		
Leader openness to experience							.72† (.07)	.23** (.07)
Leader humility (Brief LEH)		1.05† (.10)		1.06† (.10)		.96† (.08)		.85† (.06)
VIF		3.55		3.21		2.18		1.37
R^2	.31	.47	.29	.47	.25	.46	.22	.48
F	164.07†	159.87†	149.21†	160.36†	122.75†	158.78†	101.45†	170.02†
ΔR^2 from step 1		.16		.18		.21		.26

N = 369 (one participant did not provide responses on leader job performance). Unstandardized coefficients are reported. All scales were rated by subordinates. VIF stands for variance inflation factor. The two independent variables in each regression have the same VIF

*p < .05; **p < .01; †p < .001 (2-tailed)

Table 4 Incremental validity of the Leader-Expressed Humility (LEH) scale above and beyond Owens et al.'s (2013) and Ou et al.'s (2014) leader humility scales, leader arrogance, and leader openness to experience (Study 1)

	Leader job performance							
	Step 1 *B* (*SE*)	Step 2 *B* (*SE*)	Step 1 *B* (*SE*)	Step 2 *B* (*SE*)	Step 1 *B* (*SE*)	Step 2 *B* (*SE*)	Step 1 *B* (*SE*)	Step 2 *B* (*SE*)
Constant	.83** (.24)	.04 (.22)	.67* (.26)	.14 (.23)	5.15† (.13)	-.20 (.44)	1.35† (.25)	-.34 (.24)
Leader humility (Owens et al.)	.80† (.06)	-.22* (.11)						
Leader humility (Ou et al.)			.88† (.07)	-.28* (.12)				
Leader arrogance					-.58† (.05)	.03 (.07)		
Leader openness to experience							.72† (.07)	.20** (.07)
Leader humility (LEH scale)		1.22† (.11)		1.23† (.11)		1.04† (.08)		.91† (.07)
VIF		3.95		3.59		2.22		1.42
R^2	.31	.48	.29	.48	.25	.47	.22	.49
F	164.07†	169.16†	149.21†	170.45†	122.75†	165.20†	101.45†	173.08†
ΔR^2 from step 1		.17		.19		.22		.27

N = 369 (one participant did not provide responses on leader job performance). Unstandardized coefficients are reported. All scales were rated by subordinates. VIF stands for variance inflation factor. The two independent variables in each regression have the same VIF

*p < .05; **p < .01; ***p < .001 (2-tailed)

Table 5 Incremental validity of the Brief Leader-Expressed Humility (Brief LEH) scale above Owens et al.'s (2013) leader humility scale (Study 2)

	Job satisfaction		Liking for the leader		LMX		Trust		Promotive voice		Prohibitive voice	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
	B (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)
Constant	2.36†	1.59†	2.28†	1.45†	1.77†	1.03†	2.18†	1.69†	2.57†	1.93†	3.10†	2.82†
	(.28)	(.33)	(.29)	(.34)	(.19)	(.21)	(.18)	(.22)	(.25)	(.30)	(.29)	(.35)
Leader humility (Owens et al.)	.40†	.01	.45†	.02	.54†	.15*	.35†	.09	.33†	-.01	.13	-.01
	(.07)	(.12)	(.07)	(.12)	(.04)	(.08)	(.04)	(.08)	(.06)	(.11)	(.07)	(.12)
Leader humility (Brief LEH scale)	-	.57†	-	.62†	-	.56†	-	.37†	-	.48†	-	.21
	-	(.14)	-	(.14)	-	(.09)	-	(.09)	-	(.13)	-	(.15)
R^2	.13	.19	.15	.21	.38	.47	.21	.26	.11	.16	.016	.024
F	35.98†	27.29†	42.92†	32.40†	145.72†	103.63†	63.17†	41.64†	28.65†	22.15†	3.76	2.90
ΔR^2 from step 1	-	.06	-	.06	-	.09	-	.05	-	.05	-	.008

N = 240. Unstandardized coefficients are reported. All scales were rated by subordinates. The variance inflation factors for the Step 2 regressions were 3.28 for both the Brief LEH scale and Owens et al. scale

*p < .05; **p < .01; $^{\dagger}p$ < .001 (2-tailed)

Table 6 Incremental validity of the Brief Leader-Expressed Humility (Brief LEH) scale above Ou et al.'s (2014) leader humility scale (Study 2)

	Job satisfaction		Liking for the leader		LMX		Trust		Promotive voice		Prohibitive voice	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
	B (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)
Constant	1.88†	1.45†	1.98†	1.38†	1.34†	.83†	1.92†	1.58†	2.45†	1.94†	2.86†	2.75†
	(.31)	(.33)	(.33)	(.34)	(.21)	(.21)	(.21)	(.22)	(.29)	(.31)	(.32)	(.36)
Leader humility (Ou et al.)	.54†	.24	.55†	.11	.67†	.30†	.43†	.17*	.37†	-.01	.20*	.12
	(.08)	(.13)	(.08)	(.13)	(.05)	(.08)	(.05)	(.08)	(.07)	(.12)	(.08)	(.14)
Leader humility (Brief LEH scale)	-	.39**	-	.55†	-	.47†	-	.32†	-	.47†	-	.10
	-	(.13)	-	(.13)	-	(.08)	-	(.08)	-	(.12)	-	(.13)
R^2	.17	.20	.16	.22	.41	.49	.22	.27	.10	.16	.025	.027
F	47.67†	29.46†	44.30†	32.80†	166.92†	112.66†	68.09†	43.61†	25.71†	22.15†	6.04*	3.30*
ΔR^2 from step 1	-	.03	-	.06	-	.08	-	.05	-	.06	-	.002

N = 240. Unstandardized coefficients are reported. All scales were rated by subordinates. The variance inflation factors for the Step 2 regressions were 2.70 for both the Brief LEH scale and Ou et al. scale

*p < .05; **p < .01; $^{\dagger}p$ < .001 (2-tailed)

Table 7 Incremental validity of the Brief Leader-Expressed Humility (Brief LEH) scale above Owens et al.'s (2013) leader humility scale (Study 3)

	Leader job performance		Liking for the leader		Trust in the leader	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
	B (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)
Constant	.79† (.17)	.08 (.19)	1.69† (.15)	1.13† (.16)	1.79† (.12)	1.37† (.13)
Leader humility (Owens et al.)	.79† (.04)	.11 (.10)	.64† (.04)	.11 (.09)	.50† (.03)	.10 (.07)
Leader humility (Brief LEH scale)	-	.82† (.11)	-	.65† (.10)	-	.49† (.08)
R^2	.52	.59	.51	.58	.49	.55
F	313.11†	209.91†	300.53†	196.06†	278.13†	176.14†
ΔR^2 from step 1	-	.07	-	.07	-	.06

N = 292. Unstandardized coefficients are reported. All scales were rated by subordinates. The variance inflation factors for the Step 2 regressions were 6.20 for both the Brief LEH scale and Owens et al. scale

*p < .05; **p < .01; $^{\dagger}p$ < .001 (2-tailed)

Table 8 Incremental validity of the Brief Leader-Expressed Humility (Brief LEH) scale above Ou et al.'s (2014) leader humility scale (Study 3)

	Leader job performance		Liking for the leader		Trust in the leader	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
	B (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)
Constant	.53** (.20)	.03 (.19)	1.49† (.16)	1.09† (.16)	1.59† (.13)	1.32† (.13)
Leader humility (Ou et al.)	.89† (.05)	.09 (.11)	.73† (.04)	.07 (.09)	.57† (.03)	.13 (.08)
Leader humility (Brief LEH scale)	-	.87† (.11)	-	.70† (.09)	-	.48† (.07)

R^2	.50	.59	.48	.57	.48	.55
F	286.91†	209.15†	271.69†	194.82†	269.89†	176.88†
ΔR^2 from step 1	-	.09	-	.09	-	.07

N = 292. Unstandardized coefficients are reported. All scales were rated by subordinates. The variance inflation factors for the Step 2 regressions were 5.32 for both the Brief LEH scale and Ou et al. scale

*p < .05; **p < .01; †p < .001 (2-tailed)

Table 9 Incremental validity of the Brief Leader-Expressed Humility (Brief LEH) scale above leader integrity (Study 3)

	Leader job performance		Liking for the leader		Trust in the leader	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
	B (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)	*B* (*SE*)
Constant	1.95†	.09	2.75†	1.11†	2.48†	1.38†
	(.15)	(.19)	(.13)	(.16)	(.10)	(.13)
Leader integrity	.53†	.08	.41†	.01	.35†	.08*
	(.04)	(.05)	(.04)	(.04)	(.03)	(.03)
Leader humility (Brief LEH scale)	-	.86†	-	.75†	-	.51†
		(.07)		(.06)		(.05)
R^2	.36	.59	.31	.57	.36	.56
F	164.22†	212.11†	129.50†	194.17†	166.45†	181.00†
ΔR^2 from step 1	-	.23	-	.26	-	.20

N = 292. Unstandardized coefficients are reported. All scales were rated by subordinates. The variance inflation factors for the Step 2 regressions were 2.10 for both the Brief LEH scale and leader integrity

*p < .05; **p < .01; †p < .001 (2-tailed)