

Development and validation of the Leadership Effectiveness in Africa and the Diaspora (LEAD) scale

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Abstract:

This article contributes to the literature on cross-cultural leadership by describing the development and validation of the Leadership Effectiveness in Africa and the Diaspora (LEAD) Scale. The LEAD Scale is a culturally sensitive measure of leadership effectiveness in the understudied settings of Africa and the African diaspora. A combination of methods and four studies using samples from Africa and the African diaspora based in Canada, the USA, and the Caribbean were used to develop the measure. Using the grounded theory approach and the Delphi technique ($n = 192$), followed by a set of increasingly rigorous tests including exploratory factor analysis ($n = 441$), confirmatory factor analysis ($n = 116$), and a test of measure invariance ($n = 1384$), we developed and validated a culturally sensitive measure of effective leadership. Our results demonstrate that spirituality, tradition and community-centredness are important and culturally specific components of leadership in Africa and the African diaspora. This paper provides a validated measure of leadership and offers recommendations regarding the use of the measure by managers and researchers working in Africa or with African diaspora.

Keywords: Africa | African diaspora | Caribbean | Canada | factor analyses | leadership | leadership effectiveness | LEAD project | scale development | United States

Article:

Over the past 20 years, management scholars have often noted that management knowledge is biased towards ‘Western’ perspectives and that management scholars have not responded to the needs of businesses as they moved out of the developed world and into emerging/developing economies, such as Africa (Leke et al., 2018). Das et al. (2009) reviewed papers published in mainstream economic journals and found that countries with the lowest incomes and weakest economies received the least attention. Other scholars have stressed the need to address management issues from an indigenous, or local perspective as well as within the global context,

emphasizing the need to develop locally driven management concepts and measures (Holtbrugge, 2013). Management scholars have specifically highlighted the lack of research on Africa and the African diaspora. In 1997, Swartz and Davies found that in the past, much of the African literature was conceptual rather than empirical. Over a decade later, not much had changed with Walumbwa et al. (2011) stating that very little theoretical and empirical work had addressed leadership and management in Africa. To address this situation, Bolden and Kirk (2009) suggested that a grounded conceptualization of leadership, drawn from research within Africa, using a variety of methodological approaches is much needed.

More recently, researchers have started to address these issues and have looked at the role and impact of culture and leadership and management in the African context (Wanasika et al., 2011), as well as examined indigenous concepts such as Ubuntu (worldview of collectivism and togetherness) (Mbigi, 2000), spiritualism and spirituality (Mbigi and Maree, 1995; Smith, 2003), the Tree of Talking (Wambu et al., 2007), the importance of ancestors (Smith, 2003), and the traditional concept of leadership as encompassing the ‘big man’ who is all-powerful, fearsome, and all-knowing (James, 2008). Despite these positive developments, the state of knowledge remains limited and there is room for substantially more research.

Understanding culture, leadership and management in Africa and the African diaspora is especially relevant today because Africa is a new emerging destination for international business (Leke et al., 2018). The African continent holds unlimited opportunities and is open for business, with people speaking of the ‘African Lions’ (referring to successes of countries and businesses) and ‘African solutions for Africa’ (Punnett, 2017). In the current context, it is inevitable that people from different cultural backgrounds will be working together on the African continent. This further emphasizes the importance of addressing management and leadership issues from an African perspective and raising more awareness about the nature of managerial practices in this context. This will help future expatriate managers, who may find themselves working in Africa, become more effective and efficient in managing employees who are culturally African.

Similarly, in terms of cross-cultural management and understudied areas, there have also been calls for the African diaspora to work more closely with African countries and businesses (Kamei, 2011). Hence, the focus of this project includes the African diaspora to resolve this lack of study and promote cross-cultural cooperation. We also include the diaspora because this group can provide an interesting comparison, given their differing experiences.

Based on these calls to research and the need to understand leadership from an African and African diaspora perspective, this paper describes the development and validation of a culturally sensitive measure for Africa and the African diaspora, which captures a leadership perspective unique to the African and African diaspora context. In doing so, this study contributes to filling a gap in the literature and provides a practical measure for managers and researchers in Africa and the African diaspora. In essence, this paper aims to create a leadership measure with an African perspective.

In a series of four studies, this paper describes the development process of the Leadership Effectiveness in Africa and the Diaspora (LEAD) Scale using qualitative and quantitative methodologies, as well as evaluates the psychometric properties of the measure. The

development and validation of the LEAD Scale occurred in three phases. Phase 1 involved using concepts derived from the use of the Delphi technique and focus groups to develop items for the measure. Phase 2 consisted of demonstrating the need for a culturally sensitive measure and further measure development. Measure development was data driven, using quantitative survey data from Africa and the Canadian African diaspora, in order to test items identified and developed from the qualitative data, as well as to reduce the overall size of the measure. Phase 3 consisted of the validation and testing of the measure in a number of different African or African diaspora populations, including multiple countries in Africa, and the Americas.

Phase 1: Initial measure development using qualitative methodology

The LEAD research project began with the collection of qualitative data using the Delphi technique and focus groups from culturally relevant participants in order to derive concepts for item creation.

As the aim was to create a culturally sensitive measure for Africa and the African diaspora, it was essential that perceptions of what constitutes effective leadership was collected from knowledgeable individuals from a variety of culturally relevant countries. This was done in order not to bias the conceptualization. To this end, rounds of the Delphi technique and focus groups were run wherein the participants were asked general questions regarding what they considered to be effective leadership. These questions included questions such as, ‘What three to five words/phrases would you use to describe an effective leader’s personal characteristics?’ and ‘What three to five words/phrases describe what an effective leader does?’. The participants then discussed the importance of each concept or aspect of effective leadership and refined them or rated how important/relevant each concept or aspect was, depending on if they were involved in a Delphi session or a focus group. This primary stage of the measurement development was methodologically similar to Noorderhaven and Tidjani (2001), who were also interested in developing a culturally sensitive measure conceptually driven by the targeted culture rather than being Western developed. Noorderhaven and Tidjani (2001) were doing so for a more macro reason, trying to link culture to economic performance; however, using such a technique to create a measure has precedent. Our research added focus groups in order to use additional methodologies in order to elicit as many concepts as possible.

The qualitative data that were collected from the first phase of the research project were analysed and concepts were identified.¹ Data collected came from African countries (Senaji et al., 2014) including Egypt, Ghana, Kenya, Nigeria, and Uganda (N = 94). Similarly, data were collected from Caribbean countries (Holder et al., 2014) and included participants (N = 42) from Barbados, Trinidad and Tobago, St. Vincent and the Grenadines, St. Lucia, and Jamaica. African diaspora participants (N = 56) were also recruited from the United States and Canada (Galperin et al., 2014). Across the samples, participants varied including professors, religious leaders, professionals, government workers, students, managers and lower level employees.

There were a number of concepts that were similar to Western leadership concepts, such as being results-orientated/an achiever, knowledgeable/intelligent, hardworking, and visionary. Though,

¹ This research can be found in-depth in a 2014 special issue of the Canadian Journal of Administrative Sciences, though a short summary will be presented here.

there were also some leadership concepts that were strongly supported by participants as being important that did not follow the typical Western conceptualization of leadership. Some of these included: democratic, gives hope, advances subordinate economic situation, a need to help the community, a need to serve, acceptance, takes care of others, concern/empathy, support of followers, belief, society, volunteerism, gender specific, virtuous/moral, traditional, is part of the tribe, religious, respectful, proud, and wise. Once leadership concepts were identified, item creation for the measure began. To measure the culturally distinct concepts that were discovered, new items were created in discussion with culturally sensitive experts. Examples of these new items included, an effective leader: 'honours traditions', 'is pragmatic', and 'is bold'. Where concepts had been previously included in Western-created leadership conceptualizations, items were taken from existing leadership measures. For example, 'visionary' was a concept that arose and was represented in the measure by an item from the transformational leadership measure (Podsakoff, MacKenzie, Moorman and Fetter, 1990), 'Seeks creative and innovative opportunities for the organization'. As discussed above, the intent of this research was to develop a culturally sensitive measure, particularly for Africa. Nevertheless, Western measures, with already established reliability and validity, were incorporated into the LEAD Scale when these concepts emerged in the first phase of qualitative research.² The newly created and pre-established items were then combined to form the first version of the measure that is discussed in phase 2.

Phase 2: Measure development using quantitative methodology

Phase 2 of the study involved two steps. In the first step, we demonstrated the need for a culturally sensitive leadership measure by testing prominent Western leadership measures in an African diaspora sample. In the second step of phase 2, we reduced and refined the measure to make it more practical and increase its validity.

Step 1: Testing the relevance of western measures of leadership in the diaspora

Before the large-scale development of the measure began, a pre-test was conducted to see how well pre-existing Western leadership constructs were applicable in a diaspora population. This was done in order to see if it was necessary to create a culturally sensitive measure, as was hypothesized, or if Western-developed measures could be used in Africa and the African diaspora.

The pre-existing Western leadership constructs included leader empowerment behaviour, servant leadership, and transformational leadership and were measured using the Leader Empowering Behaviour Questionnaire (LEBQ) (Konczak et al., 2000); the Servant Leadership Scale (Page and Wong, 2000); and the Transformational Leadership Scale (Podsakoff, MacKenzie, Moorman and Fetter, 1990). These leadership constructs were selected because they are some of the most widely known and used Western-created leadership constructs and contained aspects that were identified during the Delphi technique and focus groups. As such, they were the most likely constructs to work in the selected populations, if any Western-developed construct were to be applicable. The LEBQ (Konczak et al., 2000) is a leadership measure designed around leaders

² A more complete description of this phase in the measure creation process can also be found in Lituchy et al. (2017).

who empower their followers, which typically involves giving them responsibilities, the corresponding power to accomplish these responsibilities and the help, support and encouragement to accomplish the responsibilities. The Servant Leadership Scale (Page and Wong, 2000), as the name suggests, measures servant leadership which is a type of leadership wherein the leader puts their followers first. The construct reflects developing, empowering, and caring for others; having integrity, humility and an aim to serve. Transformational leadership (Podsakoff, MacKenzie, Moorman and Fetter, 1990) is a form of leadership wherein a leader is able to put forward a vision for the future with them acting as an appropriate model of behaviour, where a leader sets groups goals and gets followers to buy into them, has high performance expectations and provides personalized support to followers and intellectual stimulation to aid in the achievement of their vision.

Participants and procedure

The sample of the pre-test was English-speaking African diaspora students in Barbados (n = 56). The mean age of the sample was 30.17 years ($SD = 10.65$), with 67.9% being female (n = 38) and 66.1% were employed (n = 38). Participants filled out a pen and paper version of the survey. Inter-item reliability and a confirmatory factor analysis were performed using SPSS. The survey items included the measures of LEBQ, Transformational and Servant Leadership, sample items can be found in Appendix 1. The items were measured on a five-point Likert scale ranging from strongly disagree to strongly agree with higher numbers indicating more agreement.

Results

The Cronbach's alphas were run on all the measures and their sub-dimensions and were found to be above the .70 level of acceptability, except for the sub-dimension of 'delegation of authority' from the LEBQ measure as can be seen in Table 1. However, as it was close to the typical Cronbach threshold of acceptability and taking into consideration that the sample was of an international origin, which sees more variation between items (Triandis, 1995), it was decided to retain it for further analysis.

Table 1. Barbados study measure and sub-scale reliability.

Measure	N of items	N of participants	Cronbach's alpha
LEBQ	8	55	0.72
LEBQ: Delegation of authority	3	55	0.66
LEBQ: Self-directed decision making	3	56	0.86
LEBQ: Information sharing	2	56	0.82
Servant Leader	23	48	0.94
Servant: Empowerment	10	52	0.8
Servant: Service	5	53	0.85
Servant: Vision	8	53	0.91
Transformational Leader	22	52	0.98
Transformational: Articulates a vision	5	56	0.95
Transformational: Provides an appropriate model	2	54	0.93
Transformational: Fosters acceptance of goals	4	54	0.97
Transformational: High performance expectations	3	54	0.83
Transformational: Individual support	4	55	0.87
Transformational: Intellectually stimulating	4	55	0.95

Next, AMOS was used to conduct a confirmatory factor analysis (CFA) to determine how well the existing Western-derived models fit the data from Barbados. The fit indices for the LEBQ structure were found to be: $\chi^2 (11) = 24.64, p < .01$; CFI = .89; IFI = .90. The fit indices for the Servant Leader Scale were: $\chi^2 (132) = 315.26, p < .00$; CFI = .81; IFI = .82. and the fit indices for the Transformational Leader Scale were: ($\chi^2 (194) = 468.69, p < .01$); CFI = .84; IFI = .85.

The inter-item reliability was acceptable for almost all measures, and their sub-dimensions. However, the fit indicators of the models did not reach the accepted fit level, though they did approach significance. This indicated that while the items were seen as being similar conceptually, the Western-developed leadership constructs were not completely in line with a Barbadian conceptualization of effective leadership. This indicated that a culturally sensitive conceptualization of effective leadership could have a better fit in a diaspora population, so the refinement of the culturally derived LEAD Scale continued in a different cultural setting.

Step 2: Measure refinement and primary measure validation

Preliminary measure refinement in the African diaspora of Canada

Following the decision to move ahead with the creation of the culturally sensitive measure, the decision to reduce the number of concepts identified in the focus groups and Delphi rounds was made. This was done as there were 35 concepts identified with 43 newly created items in addition to the items from the pre-existing measures. This resulted in an unacceptably long measure that would most likely result in participant fatigue and problematic data. A pilot study was conducted to merge the factors that were found conceptually similar in a data-driven (etic) process. The same pre-existing Western measures (LEBQ, Transformational Leader, and Servant Leader) were included on this survey in addition to the 43 newly created items.

Participants and procedure

The participants in this pilot study were 164 Africans and African Canadians, including students and professionals, with 56.1% living in Canada, 22.6% from Ghana, 12.8% from Uganda and 8.5% from Kenya. The mean age of the sample was 27.86 years ($SD = 9.49$), 51.2% were female, the average work experience was 7.37 years ($SD = 6.55$) and 43.3% of the sample had a job with supervisory responsibilities.

Individuals were contacted either through their university, place of work or cultural centre and asked to participate. If they agreed, they signed a consent form and were given a version of the survey that included the pre-existing Western measures and the items created from the LEAD qualitative results that conceptualized all 35 leadership concepts. Participants filled out the pen and paper version of the study, after which the data was transcribed, cleaned, assumption checked (KMO = .87; Bartlett: $\chi = 7377.54, df = 2016, sig = .01$), and then a principal component analysis was run with a varimax rotation using SPSS.

Results

Based on the scree plot a total of 64 factors were identified. Overall, 15 factors were identified that explained 73.82% of the variance, the remaining factors only explained 1.5% of variance or less. The factors found were identified as, 'likable leader' (34.91%), 'transforming servant leader' (7.37%) and 'traditional leader' (4.76%).

Based on the results, 15 data-driven factors were identified to reduce the size of the measure by combining conceptually similar factors and removing redundant items associated with the factors. Since there were a number of factors with only one or two items, new items were added for future versions of the survey in order to comprehensively assess the factors and develop a psychometrically sound measure. Following the analysis of the preliminary data, we continued with the refinement of the measure using data obtained from Africa and the Caribbean diaspora.

Measure refinement in Africa

Participants and procedure

Participants were working adults from eight different African countries. The participants came primarily from Ghana (37.6%), followed by Uganda (19.3%), Nigeria (17.7%), Egypt (11.6%), Kenya (7.0%), South Africa (4.8%), Tanzania (1.4%) and Ethiopia (0.5%). In total, 441 working Africans took part in the study with a mean age of 34.37 years ($SD = 8.62$), 9.63 years ($SD = 8.09$) of working experience with most of the sample working full-time (92.3%) and a minority working part-time (7.7%). The sample was almost evenly split with respect to gender (52.9% men and 47.1% women). The sample was fairly educated with most participants having graduate experience (51.7%), followed by undergraduate experience (43.3%), and the rest either having high school, college or no higher education (4.4%).

Participants were recruited by contacting businesses and asking if they would be willing to distribute an information letter regarding the study. If the individuals were willing to participate, they received a link to an online version of the survey that further informed them about their rights as a participant, as well as the benefits and risks of participating. The revised survey included the pre-existing Western-developed measures, as well as the LEAD developed items. In addition, new items were developed and some items removed based on the findings of the previous stage of the project. Once data collection was completed, the data were compiled, cleaned, assumption-tested and then an EFA was conducted on the data.

Results

The EFA suggested eight important factors that explained 63.36% of the variance in the data, and the remaining factors explained 2.39% of variance or less. The factors were labelled as: Factor 1: inspiration and supportiveness (34.23%), Factor 2: effective communicator (7.28%), Factor 3: interpersonal skills (6.32%), Factor 4: organizational caretaker (3.76%), Factor 5: knowledgeable (3.25%), Factor 6: gender (3.04%), Factor 7: values traditions (2.76%), Factor 8: community-centric (2.72%). Refer to Appendix 2 for EFA loadings.

The factors had much in common with the concepts that were found in the initial qualitative research with respect to effective leadership. Some concepts were generalizable to the Western

conceptualizations of effective leadership (e.g. being effective at communication and having interpersonal skills), but culturally sensitive concepts that were perhaps less important to being a leader in the West were found (e.g. honouring traditions and being community-centric). Based on the factors that resulted from the EFA, the decision to add 14 additional new items to the survey was made. This was done as some factors again had too few items. As such, items were added so that each factor had at least 4 items. For example, the item 'Thinks about the community when making decisions' was added to Factor 8 'community-centric' so that the factor had enough items for future confirmatory factor analysis. These new items are identified in Appendix 1 along with the complete item listing.

Following from the data-driven derivation of factors from the African sample, the model was then tested on an African diaspora sample in the Caribbean to see whether the factor structure was transferable to a diaspora population.

Measure refinement in the Caribbean

Participants and procedure

A total of 116 participants were recruited from English-speaking Caribbean countries including Grenada (37.9%), St. Vincent's and Grenadines (37.9%), Barbados (17.2%), Trinidad and Tobago (3.4%) and other Caribbean countries (4.3%). These participants were asked to complete the online survey. The participants were either employed individuals contacted through their work (53.4%) or students contacted through their educational institutions (46.6%). The sample was predominately female (69%), the average age was 29.92 years old ($SD = 10.68$), and the average work experience was 11.87 years ($SD = 11.26$). Most of the sample worked full-time (65.5%), some didn't work (22.4%) or worked part-time (12.1%). The sample was comprised of participants with undergraduate (48.3%), graduate (13.8%) or college education (21.6%), as well as secondary (14.7%) or primary (0.9%) education.

The survey was a slightly modified version of the past survey, the changes made having been mentioned above. After the participants completed the surveys, the data was cleaned, and assumption checked. Descriptive statistics and CFAs were run in AMOS to test if the factors found in the previous stage held true in an African diaspora population.

Results

The results of the model fit indices for the different factors applied in a Caribbean setting were mixed. There were several factors that had acceptable fit indices including: Factor 2: effective communicator; Factor 3: interpersonal skills; Factor 4: organizational caretaker; Factor 5: knowledgeable; Factor 8: Community-centric, as can be seen in Table 2. Nevertheless, some goodness-of-fit indicators, including the model chi square and NFI indicators, did not achieve a good model fit level (ex. Factor 2, Factor 3, Factor 4). This may have been due to the sample size sensitivity on both of these indices and the indices propensity to underestimate model fit for smaller samples (Hooper et al., 2008). Factor 6: gender had poor fit, with items ascertaining women's perceived effectiveness in leadership not sharing much variability in loading with items ascertaining men's effectiveness in leadership. This suggests that perceptions of males being

effective leaders is independent from the perception of females being effective leaders. Factor 7 labelled as ‘traditions’ did not have a good model fit either. The items related to religion or spirituality (e.g. ‘an effective leader is religious’) did not load well onto the relevant factor compared to items which focused on cultural traditions or laws. Finally, while Factor 1: inspirational and supportive did have considerably better model fit than Factor 6 or Factor 7, it did not reach the level normally considered acceptable. Those items that had a weaker loading focused on mentoring or coaching individual employees (e.g. an effective leader is a mentor), compared to other items that focused on helping subordinates work together and inspiring them to work towards the same goal (e.g. an effective leader gets the group to work together for the same goal).

Table 2. Model fit of LEAD 8 factors of the Caribbean sample.

Model	χ^2	Df	χ^2/df	p	NFI	CFI	IFI
Factor 1: Inspirational and supportive	124.860	27	4.624	.000	.801	.832	.837
Factor 2: Effective communicator	69.528	20	3.476	.000	.875	.905	.908
Factor 3: Interpersonal skills	59.040	27	2.187	.000	.879	.928	.931
Factor 4: Organizational caretaker	71.274	27	2.640	.000	.852	.899	.903
Factor 5: Knowledgeable	2.503	5	.501	.776	.989	1.00	1.00
Factor 6: Gender	114.030	9	12.670	.000	.618	.621	.637
Factor 7: Traditions	47.397	5	9.479	.000	.570	.554	.597
Factor 8: Community-centric	2.094	2	1.047	.351	.980	.999	.999

Overall, most factors had acceptable fit indices, so we concluded that the diaspora in the Caribbean shared a similar conceptualization of effective leadership with African participants. There were, however, some differences. Namely, a few factors (Factor 1: inspirational and supportive; Factor 6: gender; and Factor 7: traditions) had mediocre factor loadings, suggesting some cultural variation in the perception of effective leadership.

In sum, in phase 2 we demonstrated the need for a culturally-sensitive leadership measure by testing prominent Western leadership measures in an African diaspora sample and also reduced and refined the measure to make it more practical and valid. We then moved onto phase 3 where we intended to confirm the validity of the measure using a larger sample.

Phase 3: Measure confirmation in multiple populations

Following the results of the Caribbean sample, the measure was further tested using large samples from both Africa and the African diaspora in the Americas. This was done as it is important to examine the cross-cultural equivalency in measurement development. Claims of credibility of a cross-cultural measure can be open to question unless the equivalency of both the theoretical structure of a construct and the factorial structure of its measuring instrument is demonstrated for the target groups (Byrne and Campbell, 1999). While CFA analysis is often used to verify these assumptions of structure equivalency, a test of measure invariance is required to assess the psychometric properties of a measure at the item level (Vandenberg and Lance, 2000). As such, this more in-depth testing was performed.

Test of measure invariance in Africa and African Diasporas

Participants and procedure

The data were collected from diaspora populations in the Americas and Africa, in accordance with conventional research practices. The survey was distributed to students, employees and managers who volunteered to participate once they were contacted through either their educational institution or their organization. The total sample (African and the diaspora samples) was 1384 participants. The African sample included 940 participants, 50.6% of the sample was male and 48.8% was female. The average age was 32.23 years ($SD = 9.88$) with most working full-time (74.8%). The sample came from a number of African countries including Morocco (21.6%), Ghana (21.2%), Egypt (16.8%), Nigeria (14.3%), Uganda (9.4%), Tanzania (7.1%), Kenya (5.4%), South Africa (2.9%) and six other countries (1.2%). The diaspora sample was comprised of 444 participants, 52.7% of the sample was male and 47.3% was female. The average age was 26 years ($SD = 9.15$) with most working full-time (36.0%). The participants in the sample came from Canada (46.2%), the USA (38.1%), Argentina (14.9%) and small number of participants from three other countries in the Americas (0.9%).

The same measure was used as in the previous stage. Data analyses were completed using the EQS programme. The present study used the CFA procedures based on the analysis of mean and covariance structures (MACS), in addition to the analysis of covariance structures (COVS). In this analysis, we used the method of list-wise deletion of missing data. To ensure appropriateness of the method, we ran a separate analysis to review the missing data patterns. This analysis revealed an adequate goodness-of-fit. In addition, Generalized Least Squares (GLS) tests of homogeneity of means, covariance matrices and means and covariance combined, provided no evidence of internal differences of the patterns for each sample.

Results

Determination of baseline models

First, the LEAD theoretical model structure was tested separately for goodness-of-fit across the cultures under study. A first-order CFA model of LEAD was designed to test the multidimensionality of this construct, namely the model including eight previously identified factors in African and African diaspora samples. The factors were allowed to be intercorrelated, and each observable variable (questionnaire items) loaded onto one factor only, with errors of measurement for each observable variable uncorrelated. The eight-factor CFAs yielded an appropriate statistical fit for both samples, and all parameter estimates were statistically significant, loading onto the predicted factors. This separate determination of a baseline model for each group is a critical step in identifying an optimal model with both the best fit and minimal parameter specification (parsimony). Evaluation of the models was based on multiple goodness-of-fit criteria, including the Comparative Fit Index (CFI; Bentler, 1990), the Root Mean Square Error of Approximation (RMSEA; Steiger, 1990), and the Standardized Root Mean Square Residual (SRMR). The fit for first-order CFA LEAD model for both samples was good, overall supporting the eight-factors structure, so we chose to employ no modifications in our

analysis.³ This allowed us to utilize the baseline models that were completely identical across groups in terms of their structure. Statistical fit of the baseline models is provided in Table 3.

Table 3. Statistical fit of the baseline models and hierarchical models for LEAD in two cultures.

Chi square (<i>df</i>)	CFI	SRMR	RMSEA (90% CONFIDENCE INTERVAL OF RMSEA)	Adjusted Chi Square	Adjusted CFI
Baseline Models					
USA and Canada 3835.090 (1457)	.967	.079	.063 (.060, .065)		
Africa 3041.586 (1457)	.950	.073	.056 (.053, .059)		
Configural Invariance Model 6871.73 (2912)	.962	.076	.060 (.058, .062)		
Factor Loadings Invariance 6932.63 (2960);	.962	.078	.059 (.058, .061)	60.9 (48)	.00
Invariance of Factor Covariances 6986.63 (2988)	.962	.084	.059 (.057, .061)	114.9 (66)	.00
Latent Means Configural Invariance Model	.962		.060 (.058, .062)		

Note: CFI = the comparative fit index; SRMR = the standardized root mean square residual; RMSEA = the root mean square error of approximation.

Identification of referent indicators

As required for identification and scaling purposes, common factor loadings needed to be fixed to 1 in further analyses. The most similar items were identified across the groups prior to the multi-group analysis (Vandenberg, 2002). An eyeball test of EFA examined the loadings and cross-loadings and identified one for each LEAD factor that was very close in value between groups (factor loading difference of 0.1 or less). As a result, the following referent items were selected:

- Factor 1: Inspirational and Supportive, item Lead5: ‘An effective leader inspires others with his/her plans for the future’.
- Factor 2: Effective communicator, item Lead10: ‘An effective leader is focused’.
- Factor 3: Interpersonal skills, item Lead25: ‘An effective leader is charismatic’.
- Factor 4: Organizational caretaker, item Lead35: ‘An effective leader is aware of what he or she wants his or her organization to become or to do in society’.
- Factor 5: Knowledgeable, item Lead37: ‘An effective leader is hardworking’.
- Factor 6: Gender, item Lead45: ‘An effective leader behaves in a traditionally female way’.
- Factor 7: Values traditions, item Lead49: ‘An effective leader is religious’.
- Factor 8: Community-centric, item Lead53: ‘An effective leader works to improve the community’.

After identifying our baseline CFA models, we proceeded with demonstrating that our measurement instrument was equivalent across groups. In what follows, we provide a detailed analysis of psychometric properties of the LEAD scale at the item level. Moving from a less

³ Two modifications were considered based on the Lagrange multiplier test. However, these cross-loadings did not yield considerably better fit for the baseline model, so they were not applied.

stringent analysis of a factorial structure to the most in-depth test of establishing item equivalence, our aim was to establish theoretical and practical credibility of group comparisons.

Testing for configural invariance

A multi-group analysis of measure invariance requires a chain of increasingly stringent tests of groups' similarity. As contemporary research no longer examines variance-covariance matrices in a simultaneous analysis of the data (Pachulicz et al., 2008; Putnick and Bornstein, 2016), our first step was testing for configural invariance across groups. We were particularly interested in whether the eight-factor structure was an optimal representation of the LEAD construct operationalized as eight latent factors with the same pattern of free and fixed loadings across groups. The model allowed for an invariance test for both groups at the same time and the fit of this model became a baseline against which all other invariance models were compared (Byrne and Stewart, 2006). The model yielded a good fit: $\chi^2(2912) = 6871.73$; CFI = .962; SRMR = .076; RMSEA = .06, 90% C.I. [.058, .062]. So, we concluded that two groups were configurally invariant – having the same number of factors and factor loadings – thus, confirming the first step of this analysis and allowing the move to a more stringent test.

Testing for invariance of factor loadings, factor covariances and the intercept values

This analysis allowed for identifying two critical differences in the subgroups: item ambiguity and structural equivalence of the LEAD Scale for each culture. Testing for invariance of factor loadings assessed the extent of item clarity vs. item ambiguity as perceived by respondents and implied the following procedure: equality constraints were imposed on all factor loadings except one fixed to 1.00 for identification and scaling. Results from this test yielded appropriate fit: $\chi^2(2960) = 6932.63$; CFI = .962; RMSEA = .059, 90% C.I. .058, .061. Comparison of this model with the configural model yielded $\Delta\chi^2(48) = 60.90$ and $\Delta CFI = .00$, which is well within the value of .01 or less recommended by Cheung and Rensvold (2002). Based on these criteria, we concluded that the invariance of the factor loadings held for both groups and items were perceived as clear and unambiguous.

Interestingly, however, the Lagrange Multiplier (LM) Test, which allows one to identify item constraints that negatively impact model fit, showed there were several noninvariant items (items perceived differently by the two groups). While in this case, they did not make the model deteriorate significantly, from a statistical point of view, it is interesting to look more closely at them, for practical purposes. A cumulative multivariate LM Test of the Chi square was run and its incremental value and its probability reveal a few constraints that contain the items that were interpreted differently by North American diaspora versus African respondents. Most of the noninvariant items belong to Factor 3: Interpersonal skills (Interpersonal interactions). Specific items are listed in Table 4. Overall, the ambiguity ('difficulty' or low clarity) of the items were higher for the African sample. For example, the R^2 for Lead18 'An effective leader is a team-player' was .68 for the African diaspora from the Americas and .431 for the African respondents. Similarly, the value is .67 vs. .38 for Lead2 of Factor 1 'Gets the group to work together for the same goal'. In other words, non-invariance of a loading an effective leader as a team-player on the 'Interpersonal skills' factor indicated that this item was more closely associated with quality of leader's interpersonal skill/interaction in the American African diaspora than in Africa. In the

former, a leader effectiveness is more likely to be determined by a Leader being part of the team itself (in diaspora) rather than not (presumably, being above it) in Africa.

Table 4. Comparing noninvariant factor loadings (R^2).

Items/Factors	Americas Diaspora	Africa
Lead18 (F3) An effective leader is a team-player	.68	.43
Lead19 (F3) An effective leader takes charge of the situation	.41	.31
Lead23 (F3) An effective leader generally works well with others	.65	.36
Lead12 (F2) An effective leader is flexible	.48	.34
Lead2 (F2) An effective leader gets the group to work together for the same goal	.67	.38

Note: Noninvariant loadings identified in a cumulative multivariate LM test.

By employing the analysis of factor covariances, we assessed the equality of structural parameters. In this analysis, we specified the equality constraints for the eight factor covariances. The model yielded a good fit and a non-significant difference in Chi square and CFI values when compared to the configural model. Hence, the invariance of the structural covariance was supported for both groups. Again, further detail can be obtained when looking at a cumulative multivariate LM (Lagrange Multiplier) Test of constraints. The results showed group difference in covariance of Factor 3: Interpersonal skills with Factors 4 and 8 (Organizational Caretaker and Community-centric), as well as Factor 7: Values traditions with factors 6 and 8 (Gender, and Community-centric). This suggested some difference in an underlying structure of the construct of LEAD for the groups, with some factors going together in a more profound way for one group but not another. While this is an interesting observation deserving future research, it does not warrant the conclusion of measure non-invariance, at this round of analyses.

Testing for the invariance of latent means and the role of age and gender

A test of the equivalence of latent means represents an important research question as it explores the equivalence of the underlying constructs. Thus, after we established measurement invariance for the observed variables, we proceeded with the test of invariance of latent factor means, forcing the intercepts to be identical across the groups and allowing the noninvariant factor loadings to be freely estimated. In this analysis, factor means can be interpreted only relatively, in comparison to a chosen sample. We arbitrarily fixed the latent factor means for one group (Americas sample) to zero (Bentler, 2005) and compared it to the African sample. Results from this test of first-order latent mean differences yielded a model with an appropriate fit and suggested that the latent means of a comparison group are overall higher than in the African group. Interestingly, this ‘preference’ was found at the item level as well, with an exception of two items Lead49 and Lead50. Items ‘An effective leader is religious and An effective leader is spiritual’ were found to be less attractive to the Americas sample. Further analysis introduced the respondent gender and age as an invariable predictor. While gender played no statistical difference, age of the African respondents proved to be a significant predictor of the endorsement of Factor 1: Inspirational and Supportive with older individuals endorsing it more. Overall, in the African sample, the older respondents showed a stronger preference for ‘other people orientation’.

Post-hoc paired samples t-test

Following the confirmation of the measure's structure, it was decided to run a post-hoc paired samples t-test to explore factor 6: gender. Specifically, we wanted to see which gender, of the two in the factor, was more supported culturally. In the African sample there was a slight preference for male leaders ($M = 2.73$ out of 5) over female leaders ($M = 2.70$). However, there was no significant difference between preference for the genders ($t = 1.11$, $df = 919$, $p = .267$). Similarly, the North America sample had a slight preference for male ($M = 3.16$) over female ($M = 3.14$) leaders, but it was not significant either ($t = .46$, $df = 442$, $p = .648$).

Discussion

The LEAD project responded to multiple calls for empirical research on leadership in Africa (Bolden and Kirk, 2009; Punnett, 2017; Walumbwa et al., 2011) by creating a culturally sensitive measure of effective leadership. The research was undertaken from a grounded theory perspective, allowing participant opinions and data to drive a cultural-driven conceptualization of leadership effectiveness rather than imposing a potentially culturally-biased view by the researchers. Through the process, we were able to create a survey that captured unique African aspects of leadership along with conceptualizations of effective leadership found in Western-developed constructs.

In line with the previous findings of the GLOBE project (House et al., 2004), our study demonstrated that perceptions of effective leadership do have some commonalities across cultures, but also that there are differences which should not be ignored. Namely, this study revealed that while the specific conceptualization of transformational leadership held in the West might not transfer over in its entirety, some elements are shared by African cultures. For instance, Factor 1 was mostly comprised of the items from the pre-existing transformational leader measure. Similarly, a Western conceptualization of servant leadership and empowering leadership were deemed to be important in the African sample as well. Items from these measures melded into one factor (Factor 4) that fused the aspects of setting a vision and goals from servant leadership along with the support and empowerment in achieving them provided by the empowering leader (LEBQ).

A number of factors that appeared to represent universal aspects of effective leadership, albeit not tapped by the selected pre-existing Western leadership constructs, included: being an effective communicator who is willing to listen and gets their ideas across in a credible and trusted way (Factor 2); having interpersonal skills, particularly being able to work well with others, being respectful, honest, fair, and with a good sense of humour (Factor 3); and being knowledgeable (e.g. being educated but most importantly being wise and ready to learn, including from those around them) (Factor 5). The factors found to be culturally unique include valuing traditions (Factor 7) and being community-centred (Factor 8). These are not aspects of leadership that we find in Western countries and, thus, are of a particular interest to cross-cultural researchers and managers. Interestingly, culturally distinct perceptions of effective leadership (e.g. religious/spiritual aspects) found in Africa were not supported in the African diaspora. We believe that future research needs to further explore the extent and reason of the phenomenon. Acculturation to the new culture by the diaspora populations may have contributed

to the lack of valuing of traditions or spirituality. Alternatively, another explanation may be methodological issues, such as a relatively small sample size. We believe, however, that these differences do not diminish the utility of the LEAD Scale, particularly since model fit indices in the large-scale samples were acceptable.

Our test of measure invariance that assessed the LEAD Scale across different samples provided further support for the newly developed measure. Demonstrating measure invariance is a critical step in a cross-cultural assessment as it ensures that the same construct is being measured and the items are understood in identical way by the respondents in different groups such as nationality and diaspora (Baranik et al., 2008). Both African and North American African diaspora models reached acceptable model fit supporting the applicability of the measure in multiple locations for African and diaspora populations. Some differences were identified between the samples indicating certain cross-cultural peculiarities in leadership perceptions and its measurement. For instance, some questions proved to be less clear for the respondents in the African sample. However, those items did not drastically affect the model fit. That said, we believe it is important for both managers and future researchers to consider potential implications of these differences. Although most African countries are multilingual and English is a common language, the survey, which was in English, might have caused this issue due to various levels of fluency across countries and individuals. On the other hand, it may relate to cultural differences and inequivalences or lack of similar concepts in Africa. For example, the statement that, ‘an effective leader is flexible’ could have been misunderstood if the expression, ‘being flexible’ is not commonly used in Africa. The statement, ‘An effective team leader is a team-player’ may have been either misunderstood due to the language or due to the overall high power distance in Africa and lack of expectation of equality among the leader and the team.

Identified cross-cultural differences between samples

While we found enough similarities between the samples to be confident that the LEAD Scale can be used across African and African diaspora populations, we also found some interesting differences between population samples. For example, Factor 7: traditions did not have a good model fit in the Caribbean sample from phase 2 due to items regarding religion or spirituality not loading onto the factor alongside items having to do with respecting traditions. This finding seems to indicate that while Africans see religion and culture as being interlinked and part of tradition, those in the Caribbean see them as distinct concepts.

Another cross-cultural difference found was that Factor 1: inspirational and supportive also had a lower level of model fit in the Caribbean sample. This was due to items about mentoring and coaching not being seen as being conceptually similar to inspiring employees and encouraging group cohesion in the Caribbean sample. This is in contrast to the African sample who saw these concepts as being conceptually connected. It is possible that individuals in the Caribbean see a distinction between the concepts as mentoring and coaching tend to focus on one individual employee, while inspiring employees and encouraging group cohesion is aimed at the collective. Interestingly, the African sample did not see a distinction between helping behaviours aimed at the individual versus aimed at the collective. This suggests that there is a blurring of the separation between the individual and the community in the African sample, which is an aspect of African culture.

Other interesting differences took place between the African and Americas sample from phase 3. The African sample saw a relation between Factor 7: values traditions and Factor 8: community-centric, while the sample from the Americas saw no such relationship. This seems to indicate that the African sample perceived that to uphold traditions, one must be connected and concerned about the community. Again, this could be driven by cultural differences, where Africa has a tradition of focusing on the community, while North America tends to be more individualistic. Similarly, the African sample perceived relations between Factor 3: interpersonal skills, Factor 4: organizational caretaker, Factor 3: interpersonal skills, and Factor 8: community-centric, while the Americas sample did not. This seems to indicate that in Africa there is a belief that for a leader to be considered to have interpersonal skills they need to be focused on their community and their organization as a whole. Again, this is a more communal point of view that tends not to be seen in individualistic North America. Interestingly, as found by the analysis of item ratings by age, it seems the younger generations in Africa have a weaker preference for communal items, which may show a generational trend towards being more individualistic. While we can only speculate as to the reasons for these differences, they do raise interesting avenues for cross-cultural future research.

Comparison to previous African leadership research

Overall, our findings support previous work on African culture which significantly adds to the past research that has been primarily descriptive in nature rather than empirically driven. A few concepts that emerged during the measure creation process were distinct from those typically found in Western measures including: valuing traditions, being community-centric or communal, and having spirituality or religion. It is challenging to discuss the concepts of traditions, spirituality and community in African culture separately as there is overlap and meaningful connections between all three. As Mbiti (1975: 9) described, 'Religion is closely bound up with the traditional way of African life, while at the same time, this way of life has shaped religion as well'. Though the specific traditions or religions differ, there is a prevalence of both throughout Africa (Smith, 2003). This includes religions brought to Africa from outside, but also spirituality surrounding the land, and the unique role of ancestors that has its genesis in Africa (Mbigi and Maree, 1995; Smith, 2003). Traditions are also tied to having deference for the elderly and their wisdom (Wanasika et al., 2011). Interestingly, spirituality/religion and traditions came together in one factor (factor 7) in our study, further indicating how intertwined these concepts are in Africa.

In line with the literature, our study also showed the importance of communal aspects in Africa. This African conceptualization of community includes being aware of others and their interests, and actively trying to avoid impinging upon others, as doing so would be acting against the entire community (Avoseh, 2001). As part of a community, there is a focus on interpersonal relationships and maintaining these relationships which comes even before self-interest (Wanasika et al., 2011). Additionally, it is expected that individuals put community building before their self-interest; this is done through acting within one's role as a community member and engaging in one's duties (Avoseh, 2001). This aspect of community is also related to performing spiritual and traditional rites or rituals and taking care of one's extended family and community (Avoseh, 2001; Dia, 1994). This extension of priorities, beyond self-interest and

beyond one's family, can be seen in the African cultural concept of Ubuntu. Ubuntu is a world view that focuses on the collective, togetherness and how everyone has a place and role in the collective (Mbigi, 2000; Smith, 2003). One should not only be interested in family members or yourself, rather everyone is part of the collective so everyone should be as valued and supported as one would be in one's own family (Smith, 2003).

Additionally, the LEAD Scale includes other African core values. For example, Mbigi (2002) presented a number of core values such as, respect for the dignity of others, group solidarity, teamwork, service to others, and the spirit of harmony and interdependence. Although these values do not form separate factors, these values are found in items included on the LEAD Scale and integrated into factors such as: fostering collaboration; being respectful; works well with others; not seeking rewards in serving others; and being aware of what they want their organization to become or to do in society. In line with Mbigi (2002), these items are also conceptually related to the factor of being community-centric and its respective items.

Some of the empirical GLOBE findings aligned with LEAD. Wanasika et al. (2011), as part of the GLOBE project, analysed a sample of managers from south Saharan Africa (Nigeria, Namibia, Zambia, Zimbabwe, and South Africa). They found that most participants agreed with the tested GLOBE factors of 'charismatic/value-based leadership', 'team orientated leadership', 'participative leadership', and 'humane orientated leadership'. Those were the pre-established leadership factors that the GLOBE tested in a large number of countries across the globe in a massive research undertaking. Some of the GLOBE factors aligned with LEAD factors: (1) The first factor 'charismatic/value-based' is conceptually similar to the LEAD Factor 1: inspirational and supportive; (2) 'team orientated' is conceptually similar to LEAD Factor 3: interpersonal skills, which also deals with working effectively with team-mates and other people; (3) Participative leadership (advocates for and has to do with involving others in the decision making and execution process) was partially conceptually similar to LEAD Factor 4: organizational caretaker as it involves delegating authority in order to make decisions and take action; (4) humane orientated leadership (being supportive and considerate) was partially related to LEAD Factor 1: inspirational and supportive and also partially in LEAD Factor 3: interpersonal skills that deals with being respectful and fair.

Two aspects not found in the creation and validation of the LEAD Scale, but present in the GLOBE studies, were ideas of paternalism (Wanasika et al., 2011) or the 'big man' (James, 2008). Both of these concepts suggest a preference for male leaders. However, a post-hoc paired samples t-test found only a slight non-significant preference for male leaders in the African sample. The parental aspect of paternalism, however, surfaced in the LEAD Scale with effective leaders coaching, and mentoring employees, as well as having concern for their community. When it comes to the concept of the 'big man' with respect to leadership effectiveness, our findings suggest little evidence of support. Words to describe the 'big man' include all-powerful, fearsome, all-knowing, all-owning, all pervasive, multifaceted problem solver, aloof and a leader for life (James, 2008). Aside from the concept of 'all-knowing' (LEAD Factor 5: knowledge), there is no indication of 'big man' leadership preference in our sample, which may suggest a cultural shift and needs to be studied in future research.

From a methodological perspective, these discrepancies could be due to the larger number of geographically diverse countries used in our sample as compared to Wanasika et al. (2011), whose sample included only five sub-Saharan countries or James (2008) who studied Uganda, Malawi and Kenya. In a sample with few included cultures, if one culture has a strong cultural preference for males, this could skew the overall results, which would explain the differences found. Additionally, while Wanasika et al. (2011) and this study asked respondents about what they perceive to be effective leadership, James (2008) asked about their perception of actual cultural leadership. As such, the GLOBE and LEAD projects examined effective leadership, while James' (2008) explored what actually exists. This could also explain differences in findings.

As can be seen, the LEAD Scale is conceptually similar to the empirical GLOBE project when it comes to leadership concepts that are generalizable across cultures, but it also includes factors that are not discussed in the GLOBE study, which are conceptually similar to African-specific conceptualizations of leadership proposed by theoretical research but not empirically tested.

Study limitations and future research

As with all studies, this project is not without its limitations. Generalizability of the study would be one of them. Even though the team attempted to collect data in as many African countries as possible, there are 54 countries in Africa, all with various colonial histories and potentially different perspectives on effective leadership. While we included one French-speaking country, the majority of partner countries spoke English and shared Anglo colonial history rather Franco or Portuguese history. Future researchers should examine leadership effectiveness using the LEAD Scale in other African countries with French colonial history (e.g. Democratic Republic of the Congo and Ivory Coast) and Portuguese colonial history (e.g. Angola and Cape Verde).

Additionally, the inclusion of the African diaspora population inevitably raises the question of when does a culture or person cease to be culturally 'African'. In other words, how does one know if participants of the African diaspora living in non-African countries have acculturated to their new country to such a degree they have very little in common with their country of origin? In our study, the majority of participants from Caribbean countries were from African descent but their acculturation was not specifically measured. This is an issue as acculturation can vary between and within generations since migration, and is influenced by a number of factors including gender, travel to the homeland and continent of origin (Crotts and Mazanec, 2018). That said, generally research suggests that the North American African diaspora does not fully relate to either African or North America culturally in terms of perceptions of leadership, but rather fall somewhere in between (Galperin et al., 2019). Additionally, the literature has shown differences between African diaspora and western values (Boykin, 1983; Carter, 1990; Kochman, 1981; Mensah, 2014) with some African cultural values being maintained (Mensah et al., 2012; Plaza, 2004; Portes and Rumbault, 2006). Research has shown that generally the North American African diaspora maintain more of a cultural identify compared to other groups (Boykin and Allen, 2003; Zaff et al., 2002). Our study tends to support the notion that the African diaspora maintains enough cultural identity to be included in the sample as our statistical analysis indicates that the measure works similarly for both African and the diaspora populations. This suggests sufficient cultural similarities across samples. Future researchers

should further examine the acculturation of the members of the African diaspora and its impact on perceptions of leadership effectiveness.

Finally, the LEAD Scale is built around what participants perceive to be effective leadership, not what has been measured to be effective leadership. As with other cross-cultural research (Hofstede, 1980; House et al., 2004), one must also question if reported values or preferences of participants would actually be effective in the cultural context they find themselves in. For example, Wanasika et al. (2011) found that preference for participative leadership was associated with effective leadership in countries with high power distance cultures, wherein one will typically find, and locals accept, directive leadership styles. Similarly, while respondents may perceive gender equality to be a highly desirable trait for an effective leader, they may live in a culture where this is not the norm, thereby creating a mismatch between their preference and the reality on the ground. Future researchers should further examine the relationship between perceived leadership effectiveness and actual leader performance.

Practical implications

This study is particularly relevant for global organizations and organizations employing Africans or members of the African diaspora. This newly developed measure can assist managers to better understand the perceptions of leadership effectiveness in Africa and the African diaspora. The LEAD Scale can also help future expatriate managers working in Africa to further understand perceptions of leadership effectiveness so they can become more effective and efficient in managing employees who are culturally African. In addition, given the growing numbers of the African diaspora across the continents and their close connection with the African continent, this study also sheds light on how to manage and lead members of the African diaspora. By better understanding the perceptions of leadership effectiveness of the African diaspora, managers will more likely recognize the importance of cultural traditions and customs. Managers can lead their subordinates more effectively if they are willing to understand and engage with the traditions and cultures of those who work for them.

In memoriam

This article, and the entire LEAD project would not have been possible without the tireless work of Dr Terri Lituchy. For 10 years she led the project including bringing together and organizing an international team that extended across over 15 countries on three different continents. She did so with the goal of expanding research in areas of the world that have received much less attention than they should have. Unfortunately, Dr Lituchy lost her battle to cancer on March 3, 2020, much too soon at the age of 56. Ever committed, even while undergoing treatment at the hospital, Dr Lituchy continued contributing to the project, and to this paper.

Over her career, Dr Lituchy worked and mentored students at a number of universities including Concordia University in Canada, the University of the West Indies in Barbados, the CETYS University in Mexico and most recently at McMaster University in Canada. Her contributions to research was expansive being the author of 83 academic publications focusing on cross-cultural management, multiculturalism, negotiations, and women in the workforce. She was also committed to developing academics world-wide, helping start Master's programmes in the Czech

Republic, Trinidad and Tobago, and China through CIDA projects, and assisting in the development of the PhD programme at the CETYS University.

Beyond her professional achievements, Dr Lituchy was successful in just being a generally good person, friend, and mentor. She was wholly dedicated to students that she mentored, maintaining relations and offering academic and personal help with them decades after their formal relationships ended. Her dedication to both friends and colleagues was similarly devoted, always willing to lend a hand or an ear to those that crossed her path over the years. As some of these colleagues who have known Terri for decades, it is with heavy hearts that we have to write this obituary, and know that this is the last publication that we will have the pleasure to work on with her. She has left us too early, but we hope that the contributions she made over her lifetime, both to academics and to individuals, will allow her to live on.

Dr Lituchy leaves behind a loving family and a community of colleagues and students, both past and present, who will deeply miss her.

A Memorial fund in Terri Lituchy's honour, which aims to give scholarships to girls in Tanzania, has been established, please consider donating and sharing: <https://ca.gofundme.com/f/prof-terri-lituchy-memorial-grant>

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