



## Theoretical Issues in Ergonomics Science

ISSN: 1463-922X (Print) 1464-536X (Online) Journal homepage: <http://www.tandfonline.com/loi/ttie20>

# Measuring transformational leadership profiles – an empirical study across 21 nations in a multinational company

Thanh Ha-Vikström & Josu Takala

To cite this article: Thanh Ha-Vikström & Josu Takala (2016): Measuring transformational leadership profiles – an empirical study across 21 nations in a multinational company, Theoretical Issues in Ergonomics Science, DOI: [10.1080/1463922X.2016.1239780](https://doi.org/10.1080/1463922X.2016.1239780)

To link to this article: <http://dx.doi.org/10.1080/1463922X.2016.1239780>



Published online: 19 Oct 2016.



Submit your article to this journal [↗](#)



Article views: 23



View related articles [↗](#)



View Crossmark data [↗](#)

Full Terms & Conditions of access and use can be found at  
<http://www.tandfonline.com/action/journalInformation?journalCode=ttie20>

# Measuring transformational leadership profiles – an empirical study across 21 nations in a multinational company

Thanh Ha-Vikström and Josu Takala

Industrial Management Department, University of Vaasa, Vaasa, Finland

## ABSTRACT

The main purpose of this empirical research is to validate and verify the transformational leadership sand cone model, a decision-making model covering essential behaviours for transformational leaders, from resource allocations to the direction of outcomes. By using transformational leadership indexes and the Analytic Hierarchy Process-based questionnaire as well as a descriptive research approach, we measure the effectiveness of transformational leadership for 86 leaders located in 21 different geographical zones around the world. The results provide an effective measuring method and also a quantitative result that may provide the organisation a new insight into developing training programmes for global leaders. The model can be used as a direct guideline for leaders to follow and improve their transformational leadership skills. It can also be used for recruitment, selection or promotion purposes. Moreover, the model can be utilised as an aid in developing sustainable careers for global leaders.

## ARTICLE HISTORY

Received 12 July 2016  
Accepted 18 September 2016

## KEYWORDS

Transformational leadership effectiveness; transformational leadership sand cone model; leadership profile; leadership measurement; leadership index

## Relevance to human factors/ergonomics theory

Global organisations need an agile adjustable learning leadership, this paper presents a decision making model which outlines the fundamental behaviours for transformational leaders. This empirical study also demonstrates an effective evaluation method to assess the capabilities of transformational leaders.

## 1. Introduction

In order to survive in a seemingly weak economic environment, multinational organisations need to grow and continually try out and adapt to new ideas. This is the reason why they need new transformational leaders (Chen, Li, and Tang 2009). Transformational leaders, as Burns (1978), Bass (1985, 1997, 1998), Bass and Avolio (1994), Bass and Riggio (2006) have defined them, are those who stimulate and inspire followers to explore existing as well as new horizons. In other words, transformational leaders provide a perfect fit for challenging organisations or complicated work groups, where followers really need an inspirational leader who can motivate

and encourage them through a complex or uncertain situation and also make them feel empowered (Bass and Riggio 2006).

In recent years, many case studies have revealed a trend that 80% of the total sample of leaders demonstrate the transformational leadership style (Kazmi, Takala, and Naaranoja 2015). Surprisingly, in a real business environment, for example in a multinational company, the term transformational leadership still seems to be unknown to many middle-level leaders. This is even despite the fact that nowadays almost every profitable multinational company tries to invest in leadership training, and to make sure that all leaders have the right skills to take the company to the highest level of performance.

The purpose of this study is to examine and measure the effectiveness of transformational leaders, and to strengthen the value of a transformational leadership sand cone model.

Our main research question is: ‘To what extent do leaders in this multinational company display transformational leadership?’

Earlier studies have developed measurement methods focusing on describing the theories and techniques to show the correlation between different leadership styles and performance (Podsakoff et al. 1990; Nissinen 2001; Schaubroeck, Lam, and Cha 2007). From such a perspective, Takala et al. (2005, 2006a, 2008b) investigated the theoretical model developed by Bass (1985) to identify a model with five dimensions of transformational leadership. Takala et al. (2006a, 2008b) re-examined this theoretical model and introduced a conceptual sand cone model, which in turn can evaluate leadership behaviours from resource allocations to the direction of outcomes. This concept was studied and tested in a military environment in Finland from 2005 to 2008.

Despite the promising findings of this longitudinal research, further empirical research is still needed to verify and validate the earlier mentioned conceptual model in an environment other than the military. In a recent study, Ha-Vikström and Takala (2016) have developed and re-constructed the existing concept into a new analytical model for a transformational leadership profile, and also offered new equations of transformational leadership index, which provides a more descriptive assessment of the capabilities of transformational leaders. In that study, 26 experienced middle-level managers/leaders from four different business units in a global company participated. In spite of the noticeably results mentioned earlier, the sample size was still relatively small compared with the total number of leaders in the company. Therefore, this study addresses that concern by expanding the sample from 1 country to 21 countries, and by increasing the number of participants from 26 middle-level leaders to 86.

This empirical research offers a fresh perspective in systematic means for assessing the capabilities of transformational leaders. This simple evaluation concept can be utilised for recruitment, selection or promotion purposes. Finally, this new conceptual model can also be used as an aid in developing sustainable careers for global leaders.

The present study has utilised a descriptive research method, a questionnaire and three conceptual frameworks: (a) transformational leadership sand cone model, (b) Analytic Hierarchy Process (AHP) tool and (c) transformational leadership indexes. This paper is organised as follows: first, the conceptual frameworks are introduced; second, the method with data collection and measuring are described; third, the results are presented; and finally, discussion and conclusions are addressed.

## 2. Conceptual frameworks

The conceptual frameworks of this study are constructed and incorporated the AHP tool and the transformational leadership sand cone model, but the overall coherence concept builds on from our previous research.

### 2.1. AHP tool and Questionnaire

The first conceptual frame used in this study is the AHP, a multi-criteria assessment tool which is based on mathematics and psychological concepts through pair-wise comparisons. The AHP was innovated and developed by Saaty in 1970 and has been widely studied and developed since then. The evaluation among different factors helps us in making decisions in complex situations. The model has been used around the world in a wide variety of decision situations, in fields such as business, industry, healthcare, education and government (Saracoglu 2013). In this study, the Expert Choice software (which implements the AHP) was utilised for the calculation, where qualitative objects are converted to quantitative values (Saaty 1982).

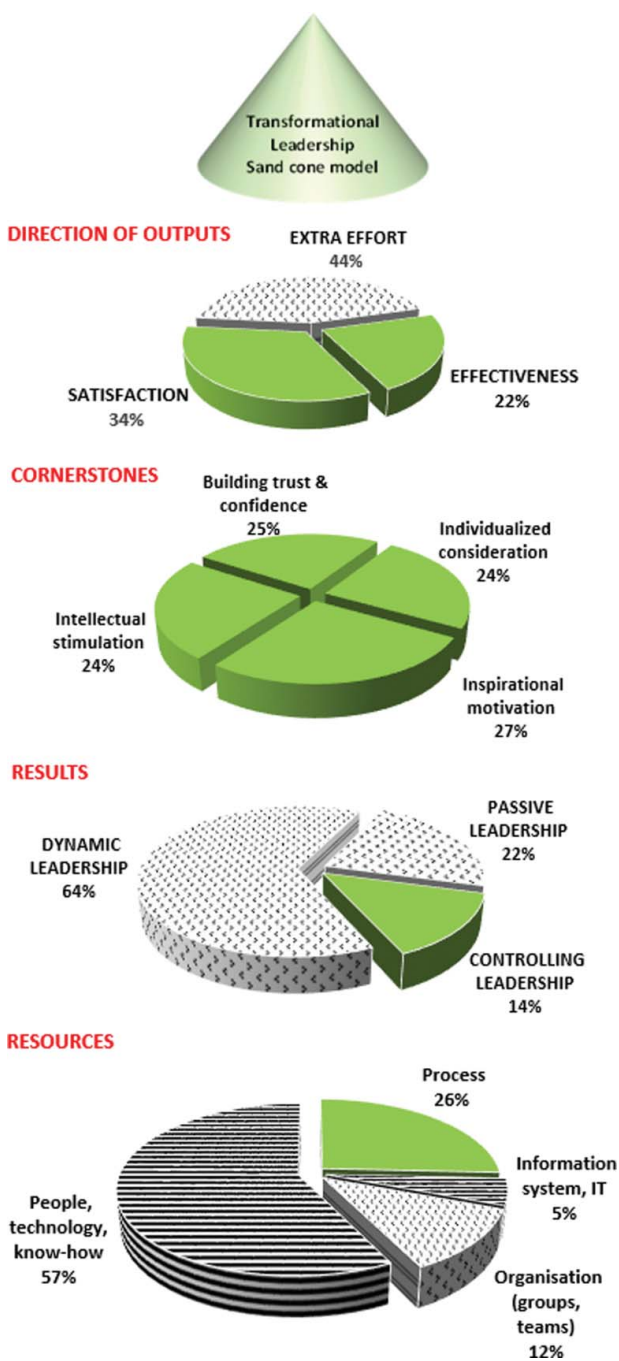
The qualitative object is a questionnaire which consists of in total 30 pair-wise comparison statements that based on the AHP concept, and the ten dimensions of deep leadership of Nissinen (2006). Details of the questionnaire will be presented in Section 3.1

### 2.2. Transformational leadership sand cone model

The second conceptual frame used in this research is the transformational leadership model (Figure 1). It was developed and re-constructed based on the original sand cone model, which was invented by Takala et al. (2005, 2006a, 2006b; Takala, Kukkola, and Pennanen 2008a, 2008b). This transformational leadership model is supported by four main parts: resources, results, cornerstones and direction of outcomes. **Resources** are the basis that consists of processes (PC); people, technology, know how (PT); information systems (IT); and organisation groups and teams (OR). These four resources (PC, PT, IT, OR) are equally important; therefore the defined balance optimal value is 25% each (Takala, Kukkola, and Pennanen 2008a, 2008b).

Next, the following level is **Results** component, which includes three categories of leadership: passive, controlling and dynamic leadership in which passive and controlling leadership are least effective and concentrate more on corrective actions (Bass and Riggio 2006). In contrast to passive and controlling leadership, dynamic leadership plays a significant role; Progen (2013) defines dynamic leadership as a dual-focused form of adaptive leadership that allows a leader to react to changes by being proactive. Duffy (2006) explains dynamic leadership as leading with courage, passion and vision. In fact, as the world has become more complicated, dynamic times require dynamic, driven leaders (Williams 1998). Thus, the optimal value defined for dynamic leadership element is 82%, while for controlling and passive leadership is 9% each (Ha-Vikström, Takala 2016).

The third level is **Cornerstones** component, where the group of the *three I's* element and *building trust* element were formed: Intellectual stimulation (IS), Individualised consideration (IC), Inspirational motivation (IM) and Building trust and confidence (BT).



**Figure 1.** Transformational leadership sand cone model.  
Source: Thanh Ha-Vikström and Takala (2016).

Jung and Avolio (1999); Kirkpatrick and Locke (1996); Bono and Judge (2003) describe these three 'I's as follows:

- Intellectual stimulation (IS): describes those transformational leaders who stimulate their followers' efforts to be innovative and creative. It refers to the leader's capacity to encourage his or her followers to think out of the box and generate new ideas.
- Individualised consideration (IC): describes those transformational leaders who pay special attention to each individual follower's needs for achievement and growth by acting as a coach or mentor, creating new learning opportunities helping followers to develop their own leadership potential.
- Inspirational motivation (IM): means leaders provide meaning and a vision for their followers' work by displaying enthusiasm. Motivate and set more challenging expectations and typically achieve higher performances.
- Building trust (BT), which originated from Idealised Influence constructed by Bass (1999) to describe transformational leaders, is a role model for their followers, encourage their followers by demonstrating care, showing respect, development of mutual trust and demanding equality. (Bass 1999; Bass and Riggio 2006; Bass and Steidlmeier 1999; Dirks and Ferrin 2002).
- Due to the equivalent importance of each element in this 'Cornerstones' component, the defined optimal value for each element is 25% (Takala, Kukkola, and Pennanen 2008a, 2008b).

Finally, the highest level of the model is the Direction of outputs component, which is divided into three types of performances: Effectiveness (EF), Satisfaction (SA) and Extra effort (EE); a main foundation of the 'Prospector, Analyser and Defender model' which was invented by Takala, Kukkola, and Pennanen (2008a). Extra effort EE, or Prospector (oriented for the future and extra effort); Effectiveness EF, or Defender (oriented for current results, less effort for future); Satisfaction SA, or Analyser (oriented between prospector and defender). In contrast with three previous components, the optimal value defined for 'directions of outputs' is 33.3% each, that is Effectiveness EF = Extra Effort EE = Satisfaction SA = 33.3%.

The values of variables mentioned earlier (given in the appendix section) are coloured by using a traffic light technique defined by Takala, Kukkola, and Pennanen (2008a, 2008b). The **green** colour stands for strength in the current variable, the **yellow** colour stands for possibility for development, and the **red** colour stands for focus in the development potential.

### 2.3. Transformational leadership indexes

The last conceptual frame utilised in this study is five new equations that have been developed and constructed based on our recent research. These formulas as follows:

Transformational leadership index (TLI)

$$TLI = 1 - \frac{\sum \text{ABS values}}{\sum \text{Optimal values}} \quad (1)$$

**Note:** ABS values = ABS (respondent behaviour's result – optimal value)

Optimal value IC = IM = IS = BT = 25; PC = PT = IT = OR = 25  
 EF = SA = EE = 33.3; DL = 82, CL = PL = 9

$$\text{Specific index} = 1 - \left( \frac{\text{Absolute difference}}{\text{Maximal difference}} \right) \quad (2)$$

Note: Maximal difference EF = SA = EE = (100 - 33.3) = 66.7

Maximal difference IC = IM = IS = BT = (100 - 25) = 75

Maximal difference PL = CL = 91;

Maximal difference DL = 82

Maximal difference PC = PT = IT = OR = (100 - 25) = 75

**Outcome index OI; Leadership index LI; Resource index RI equations:**

$$\text{OI} = \text{Mean (Specific index \{EF, SA, EE\})} \quad (3)$$

$$\text{LI} = \text{Mean (Specific index \{IC, IM, IS, BT, PL, CL, DL\})} \quad (4)$$

$$\text{RI} = \text{Mean (Specific index \{PC, PT, IT, OR\})} \quad (5)$$

Note: All acronyms mentioned in Equation (1)–(5) were explained in the previous transformational leadership sand cone model given in Section 2.2.

### 3. Method

This study is a cooperative venture between the University of Vaasa and the Learning and Development department of a multinational energy company. With respect to the requirement of the studied company, its name as well as the different business units will not be revealed. The participants are the middle-level managers/leaders in four different business units. This level of managers was chosen since they have the largest amount of subordinates/followers compared to higher levels. Regarding the research method, we utilise a descriptive research approach to answer our specific research question and also to describe the facts in an accurate way.

#### 3.1. Questionnaire

The questionnaire we used in this study was designed as a web survey, which included two main parts, the first part contains 12 questions related to the participants' background; the second part consists of 30 pairwise comparison statements divided into seven groups. This second part was developed by Takala et al. in 2005 to 2008 and has been comprehensively improved since then and also at this time (a sample of the questionnaire can be found in the appendix). The goal of this AHP-based questionnaire is to get the best description of the leaders' behaviour.

A survey invitation email which included a web survey link was sent out to 138 mid-level managers/leaders at the same company but located in 21 different countries around the world (a list of these countries and locations can be found in the appendix). In the survey invitation email we assured that respondents' answers will be completely anonymous and in the questionnaire we have also emphasised that there are no right or wrong answers.

### 3.2. Data collection

All in all, 86 leaders filled in the questionnaire, which gives a response rate of 62% (86/138). The average completed time for the questions was 20 minutes.

- **Nationality region:** 35% of the participants were from Europe, 40% from Northern Europe and 25% from the Middle East and Asia.
- **Business unit:** this studied company consists of four business units A, B, C, D. 16% (14/86) of the participants were from unit A, 14% (12/86) from unit B, 16% (14/86) from unit C and 53% (46/86) from unit D.
- **Gender:** 80% of the participants were male (69 leaders), and 20% of participants were female (17 leaders).
- **Leaders/followers have the same nationalities:** 55% (47/86) of the participants have subordinates with the same nationality as themselves, and 45% (39/86) of the participant leaders have subordinates from other nationalities.
- **Education:** 6% (5/86) of respondents have a doctoral degree and 36% (31/86) have a Master's degree; 37% (32/86) have a Bachelor's degree; and 21% (18/86) have other degrees.
- **Experience:** 14% (12/86) of respondents have been working in this company for over 20 years, 44% (38/86) have under 20 years' experience, and the rest with less experience is 14% (12/86).
- **Number of followers:** 47% (41/86) of respondents have over 10 direct subordinates/followers, and the rest or 53% (45/86) have less than 10 direct followers.
- **Leaders' responsibilities recently changed** (survey question: Have your responsibilities recently (during this year) significantly changed? e.g. change of position or job description, working conditions or location etc.) The result of this question is: 30% (25/86) of respondents have recently or during this year had some significant responsibility changes (such as position, work conditions or location). This last factor was taken into account because it may have some impact on the leaders' decision-making behaviour which might reflect on the responses.

At the final stage of the AHP measurement, we calculated a Consistency Ratio (CR) in order to measure how consistent the judgments have been relative to large samples of purely random judgments (Saaty 1982). If the CR is higher than 0.3 the judgments are untrustworthy; therefore, in this case study only answers with CR of 0.3 or lower can be considered as reliable and can be analysed further.

### 3.3. Measures

The Expert Choice software package (which implements the AHP) was utilised in this study to calculate and obtain priorities for each transformational leadership behaviour. The first calculation was performed by applying the answers from all 86 respondents to the Expert Choice software ( $86 \times 30 = 2580$  answers). From this first round of calculation the results were: 64 out of 86 respondents have trustworthy answers (74%), and 22 out of 86 respondents have one or more answers with CR higher than 0.3 (26%). Now, the number of respondents who have qualified answers is 64 (a collection of these usable answers can be found in the appendix). Then, the following calculation was performed by



exporting the data of  $64 \times 30 = 1920$  answers into Microsoft Excel; in which data were analysed further by following the transformational leadership concept and the traffic light values (see appendix).

From this second round of calculation and analysis, 64 leadership profiles were created; an example can be seen in [Figure 1](#). Finally, TL indexes for each leader were calculated by using five transformational leadership equations ([Section 2.3](#)) in Microsoft Excel. In the final step, each leader obtained not only a transformational leadership profile with traffic light colours, but also five different indexes: total leadership index, specific index, resource index, leadership index and outcomes index.

The average and median are two of the most common valid measures for central tendencies; however, in different situations, the mean/average is more appropriate to use than the median or vice versa ([Statistics and Probability Dictionary 2016](#)). In this study, the data-set is quite symmetric (the lowest index is 0.37 and the highest is 0.74); therefore, the mean or average is appropriate to use for this survey's statistics.

### 3.4. Validity and reliability

In order to verify the transformational leadership sand cone model, our measurement procedure has been designed to gain access to the construct validity, internal and external validity.

- In terms of **construct validity**, we made a control test for each equation (see appendix). In addition, the questionnaire also included 12 extra questions to reduce possible inconsistencies in the answers.
- For the **internal validity**, as mentioned earlier, we utilised the inconsistency ratio ICR (0.3) to disqualify all the inconsistent answers from the respondents.
- For the **external validity**, we utilised a semi-strong and weak market test. It was carried out by interviewing high-level managers in order to get a confirmation for either low or high data correlation acquired from our inter-correlations analysis. In this case study, we asked a Director and a General Manager who both work at the same studied company. The interview took place in a short meeting. Both interviewees supported the high negative correlation results ( $-0.66$ ) between Effectiveness and Extra Effort factors.

Finally, we also learn from literature related to different types of leadership to verify and validate the transformational leadership sand cone model.

## 4. Results

Due to space constraints, only sample results for a few randomly chosen participants is presented in the below paragraphs.

[Table 1](#) demonstrates a sample result of two participants; group 1 to group 7 indicate the results from the questionnaire. Resources, Results, Cornerstones and Outputs are the four components of the sand cone model. The traffic light colour visible in this table can be transferred to the transformational leadership sand cone model. All acronyms in this table such as IC, IM, IS, BT and so forth were explained in the previous section. CR = consistency ratio.

[Table 2](#) demonstrates a sample result of five participants ID. This result shows the absolute/ABS difference value between the optimal value and the value obtained from the

Table 1. A sample result: a consolidation result for leadership profile.

S8	CORNERSTONES			RESOURCES			OUTPUTS			RESULTS		
	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 11	Group 12	Group 13
9.6	11.5	10.5	10	12.6	41.6	24.7	11.3	41.6	24.7	41.6	24.7	41.6
55.1	5.6	52.7	43.3	41.6	12.6	13.1	42.5	12.6	13.1	12.6	13.1	12.6
8.8	40.8	20.7	46.6	45.8	45.8	62.2	46.2	45.8	62.2	45.8	62.2	45.8
26.5	42.2	16.1	16.1									
CR = 9,7%	CR = 9,5%	CR = 17,6%	CR = 0,6%	CR = 1%	CR = 1%	CR = 22,7%		CR = 1%				
TLI												
S10	CORNERSTONES			RESOURCES			OUTPUTS			RESULTS		
	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 11	Group 12	Group 13
6.4	27.8	13.3	7.7	11.7	23.5	45.8	10	23.5	45.8	45.8	45.8	45.8
27.1	8.4	24.6	46.2	26.8	11.3	6.3	36	11.3	6.3	6.3	6.3	6.3
21.4	44	7.5	46.2	61.4	65.2	47.9	54	65.2	47.9	47.9	47.9	47.9
45.1	19.9	54.7	54.7									
CR = 5,6%	CR = 7,6%	CR = 19,1%	CR = 0%	CR = 7,7%	CR = 14,1%	CR = 0,2%		CR = 14,1%				
TLI												

Note: in the black and white printed version, the traffic light colours in table 1 are changed, the green colour is signified with a check mark, yellow with an exclamation mark, and red with an × mark.

Table 2. A sample result: ABS difference value.

IM	ABS Diff. IS	ABS Diff. BT	ABS Diff. PC	ABS Diff. PT	ABS Diff. IT	ABS Diff. OR	ABS Diff. EF	ABS Diff. SA	ABS Diff. EE	ABS Diff. PL	ABS Diff. CL	ABS Diff. DL	TOTAL of ABS Diff.
3.2	4.2	2.1	2.1	5.9	13	16.8	14.1	11.4	25.6	26.2	3.4	29.6	167.3
7.3	13.8	10.8	29.9	1.7	19.3	12.3	20.7	8.3	29.1	33.7	1	34.7	239.9
12	18.4	18.4	10.5	30.8	1	19.3	6.1	6.1	12.1	38.1	3.1	34.9	222.7
3.3	16.5	0.3	14.8	13	15.8	14	31.7	16.3	15.3	8.4	10.2	18.6	191.2
0.7	22.8	9	4.1	16.1	19.2	0.9	16.6	22.8	6.3	44.9	0.4	44.6	222.9

**Table 3.** A sample result: specific index.

ID	Specific IC	Specific IM	Specific IS	Specific BT	Specific PC	Specific PT	Specific IT	Specific OR	Specific EF	Specific SA	Specific EE	Specific PL	Specific CL	Specific DL
1	0.87	0.96	0.94	0.97	0.97	0.92	0.83	0.78	0.79	0.83	0.62	0.71	0.96	0.64
2	0.77	0.90	0.82	0.86	0.60	0.98	0.74	0.84	0.69	0.88	0.56	0.63	0.99	0.58
3	0.84	0.84	0.75	0.75	0.86	0.59	0.99	0.74	0.91	0.91	0.82	0.58	0.97	0.57
4	0.83	0.96	0.78	1.00	0.80	0.83	0.79	0.81	0.53	0.76	0.77	0.91	0.89	0.77
5	0.81	0.99	0.70	0.88	0.95	0.79	0.74	0.99	0.75	0.66	0.91	0.51	1.00	0.46

answers. The last column is the sum of the ABS difference values of 14 factors. Theoretically, the highest absolute difference value can be equal to 400 ( $4 \times 100$  for each component). For this result, the lower ABS difference value, the better the TL index. In other words, the closer the optimal value, the smaller the ABS difference value.

Table 3 demonstrates a sample result of five participants ID. This result shows the specific index for each factor using Equation (2) (see Section 2.3).

Table 4 demonstrates a sample result of the total of the absolute difference values and transformational leadership index. The higher the index, the better the performance. The scale for transformational leadership index is 0 to 1. 0 is the worst and 1 is the best.

Table 5 demonstrates a sample result of three indexes: outcomes index, leadership index and resource index. The scale for these three indexes ranges from 0 to 1. 0 is the worst and 1 is the best. However, do note that the indexes in Table 5 are not comparable to the TL index in Table 4 and specific index in Table 3 due to different normalisation formulas.

Figure 2 presents a consolidation of the transformational leadership index based on 64 usable responses. Every dot in the graph represents the transformational leadership index for one participant. The highest TL index of this group ( $n = 64$ ) is 0.74, and the lowest is 0.37. As a result, the mean transformational leadership index for all participants is 0.53. The circle in the graph (Figure 2) indicates the mean index for all participants.

Table 6 presents descriptive statistics and inter-correlations between the outcome index, leadership index, resource index and transformational leadership index. Observably, the correlation between three indexes (OI, LI, RI) and the TL index are high (0.4; 0.6; 0.6); and this could justify the validity of the new equations.

**Table 4.** A sample result: ABS transformational leadership index.

Part. ID	Total of ABS diff.	TL index
1	167.3	0.58
2	239.9	0.4
3	222.7	0.44
4	191.2	0.52
5	222.9	0.44

**Table 5.** A sample result: outcomes index, leadership index and resource index.

Part. ID	OI	LI	RI
1	0.74	0.87	0.87
2	0.71	0.79	0.79
3	0.88	0.76	0.79
4	0.68	0.88	0.81
5	0.77	0.76	0.87

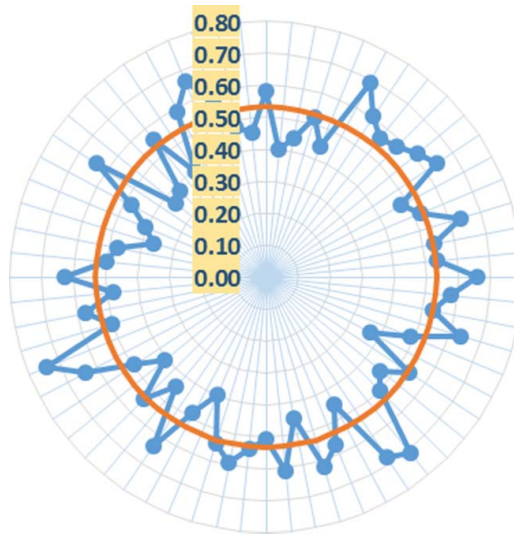


Figure 2. Total transformational leadership index.

Table 7 presents the data analysis and inter-correlations between 14 factors and transformational leadership index. The correlation coefficients can vary numerically between 0.0 and 1.0. The closer the correlation is to 1.0, the stronger the relationship between the two variables. In this table, there are several correlation coefficients that indicate the existence of a medium to strong relationship, for example: a) between effectiveness EF variable and extra effort EE variable ( $-0.66$ ); b) between extra effort EE and satisfaction SA ( $-0.52$ ); c) between dynamic leadership DL and passive leadership PL ( $-0.85$ ); d) between controlling CL and passive leadership PL is ( $-0.50$ ).

## 5. Discussion

### 5.1. Discussion

This study strengthens the empirical evidence that leadership behaviour can be effectively visualised in a holistic way by using the transformational leadership sand cone model. The analytical model is definitely simple to use, with respect to the AHP-based questionnaire which is quite straightforward for the leader to answer. The common traffic light defined in the model could help leaders easily recognise on what and where they should focus in order to get maximal results of the outcomes. The colourful profile is a clear

Table 6. Descriptive statistics and indexes inter-correlations.

	Variables	Mean	SD	Min	Max	1	2	3
1	TL index	0.53	0.09	0.37	0.74	1		
2	Outcome index, OI	0.82	0.09	0.62	1	0.4	1	
3	Leadership index, LI	0.82	0.05	0.72	0.9	0.67	$-0.2$	1
4	Resource index, RI	0.84	0.07	0.72	1	0.62	0.17	0.04

NOTE: The correlation coefficients between TL index and Outcome index is 0.40. The correlation coefficients between TL index and Leadership index is 0.67. The correlation coefficients between TL index and Resource index is 0.62. These high scores indicate the presence of a strong relationship between 4 indexes.



Table 7. Data analysis and inter-correlations.

	IC	IM	IS	BT	PC	PT	IT	OR	EF	SA	EE	PL	CL	DL	TLI
Diff. IC	1.00														
Diff. IM	-0.40	1.00													
Diff. IS	-0.45	-0.05	1.00												
Diff. BT	-0.04	-0.54	-0.50	1.00											
Diff. PC	-0.03	-0.22	0.04	0.19	1.00										
Diff. PT	0.12	0.10	-0.23	0.02	-0.42	1.00									
Diff. IT	-0.13	0.12	0.06	-0.06	-0.38	-0.38	1.00								
Diff. OR	0.04	-0.04	0.20	-0.18	-0.10	-0.48	-0.19	1.00							
Diff. EF	-0.24	-0.02	0.21	0.03	0.03	-0.12	0.21	-0.11	1.00						
Diff. SA	0.12	-0.23	-0.16	0.26	-0.06	0.09	0.01	-0.07	-0.30	1.00					
Diff. EE	0.12	0.20	-0.06	-0.23	0.02	0.04	-0.19	0.16	-0.66	-0.52	1.00				
Diff. PL	0.20	-0.14	0.00	-0.04	0.12	-0.03	-0.12	0.03	0.07	0.04	-0.09	1.00			
Diff. CL	-0.05	0.03	0.06	-0.04	-0.13	-0.21	0.21	0.18	-0.07	0.04	0.03	-0.50	1.00		
Diff. DL	-0.20	0.14	-0.04	0.07	-0.07	0.15	0.01	-0.14	-0.03	-0.07	0.08	-0.85	-0.02	1.00	
TL index	-0.16	-0.09	0.10	0.12	0.03	-0.43	0.28	0.24	0.08	0.27	-0.29	-0.48	0.26	0.40	1.00

guideline for leaders to follow and improve their leadership behaviours as well as their decision-making.

With respect to the research question:

‘To what extent do leaders in this multinational company display transformational leadership?’

The results obtained from the total of the TL index presented in [Figure 2](#), which shows an average index of 0.53. By using a word rating scale: Excellent  $\geq 0.8$ , Good  $\geq 0.6$ , Average  $\geq 0.5$ , Poor  $\geq 0.3$ , Very poor  $\geq 0$ , we can conclude that 0.53 is the average. This result conveys a clear message to help the organisation in having better understanding of their current transformational leadership effectiveness.

In this study, we focused on the transformational leadership sand cone model, which contains four components with 14 performance factors. That is, first, the *Resources* component consists of four factors; second, the *Results* component consists of three factors; third, the *Cornerstones* component consists of four factors and finally, the *Direction of outcomes* component consists of three factors. Each performance factor was defined with an optimal value (see [Section 2.2](#)); if the answers of the respondents are closer or equal to the optimal values, then the calculated TL index will be good (1 is the best index). The better the performance, the higher the index. The performance result will reflect on the leadership profile; in other words, a good performance will give a green leadership profile. In contrast, if the answers are far away from the optimal values, then the TL index will be low; consequently the leadership profile will be shown as red. Furthermore, as the inter-correlation values within the 14 behaviour factors were high, from 0.40 to 0.85 ([Table 7](#)), this gives a strong indication of a trustworthy model.

## 5.2. Implications

This research delivers three practical implications:

**Implication 1**, our results offer a simple but effective measuring method to create a clear leadership profile with traffic light colours, the colour and the weight for each behaviour in the profile provide a visual guideline, which leaders easily can follow to increase their own self-awareness and improve their leadership skills. Admittedly, this concept can be utilised for any respondents who are able to answer the questionnaire consistently, he/she does not need to be a leader, he/she can be a university student, a teacher, an officer, a nurse or any other occupation.

**Implication 2**, the indexes obtained through the results from *Implication 1* above, can be utilised by management or Human Resources for recruitment or promotion purposes.

**Implication 3**, the three groups of people in the model (Prospectors, Analysers and Defenders) provide a foundation for further research in developing sustainable careers for global leaders.

## 5.3. Limitations and further research

In spite of the size and diversity of the studied company, our investigation still has limitations that must be addressed in order to open a reference point for further studies. First, this study examines and measures the effectiveness of global mid-level transformational leaders, although it is clear that leadership behaviours can be visualised and measured by using the sand cone model; however, what is less clear is how factors such as cultures,

genders, education, working experience or financial situation of the company influence the effectiveness of transformational leaders. Therefore, further research should focus on this perspective in order to get better understanding of the fundamental changes in people management practices. The second limitation of this research is related to the descriptive statistics results, although the correlation between transformational leadership index and three other indexes (OI, LI, RI) was high (0.4; 0.7; 0.6), the correlation between LI and RI was not as strong as expected (0.04). Thus, further longitudinal studies are needed as we continue to expand this model deeply into the sustainable career research area.

## 6. Conclusions

This is one of the first large-scale studies to empirically test the analytical transformational leadership sand cone model in a multinational business environment. This study's uniqueness is the large sample of participants from 21 different geographical zones around the world. The research provides not only an effective measuring method, but also offers a quantitative result to the company. This finding may convey to the organisation a new insight into developing training programmes to support the leaders in improving their transformational leadership behaviours from national to global levels. Furthermore, this simple evaluation concept can be utilised for recruitment, selection or promotion purposes for any company. We expect these new findings to significantly increase the use of this transformational leadership sand cone model, because this new model, beyond the benefits mentioned earlier, can also be used as an aid in developing sustainable careers for global leaders, or as a recipe for leadership success.

## Acknowledgments

The authors wish to express a sincere thanks to the participants and the Learning & Development Department of the company studied.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Notes on contributors

*Thanh Ha-Vikström* is a PhD student at University of Vaasa Finland with 25 years experience in Industrial and Supply Chain Management.

*Prof. Dr Josu Takala* has a vast experience in both industry and academia. He worked for ABB (Strömberg), and belongs to ABB (Asea Brown Boveri) Group. ABB Strömberg consists of about 30 independent limited companies in the wide business area of electronics and technologies. R&D is 8% of the turnover (3000 million USD/1995) in the divisions of R&D, quality-assurance-related tasks to automation as researcher and manager in 1979–1992. He has received his MSc degree in electrical engineering from Tampere University of Technology in 1980 and Dr.Tech. degree in electrical engineering and business studies in the University of Vaasa in 1988, as well as Dr.HC degree from the Technical University of Košice in 2009. Also, he has received his Dr.HC degree in technology management and business in Universiti Tun Hussein Onn Malaysia in 2015. Currently, he is a professor in Industrial Management at the University of Vaasa, Finland, from 1988 onwards,

besides other multiple universities in Finland and abroad such as Thailand, Malaysia, China, Slovakia, Slovenia, etc. His field of interest is mainly technology management in the sustainable competitive strategies of private and public organisations in manufacturing networks by utilising the generic fields of quality management, (technology) strategy, new product development, production management, logistics and environmental management. Over 500 scientific articles were published. He was a co-editor, special issue editor, member of Scientific Board in journals like MPER, MNG, etc., and invited or key note speaker, and chairman or honoured chairman in international conferences.

## References

- Bass, B. 1985. *Leadership and Performance Beyond Expectations*. New York: Free Press.
- Bass, B. 1997. "Does the Transactional-Transformational Leadership Paradigm Transcend Organizational and National Boundaries?" *American Psychologist* 52: 130–139.
- Bass, B. 1998. *Transformational Leadership: Industrial, Military, and Educational Impact*. Mahwah, NJ: Erlbaum.
- Bass, B. 1999. "Two Decades of Research and Development in Transformational Leadership." *European Journal of Work and Organizational Psychology* 8 (1): 9–32.
- Bass, B., and B. Avolio, eds. 1994. *Improving Organizational Effectiveness Through Transformational Leadership*. Thousand Oaks, CA: Sage.
- Bass, B., and R. Riggio. 2006. *Transformational Leadership*. 2nd ed. Mahwah, NJ: Lawrence Erlbaum Associates.
- Bass, B., and P. Steidlmeier. 1999. "Ethics, Character, and Authentic Transformational Leadership Behaviour." *Leadership Quarterly* 10 (2): 181–217.
- Bono, J., and T. Judge. 2003. "Self-Concordance at Work: Toward Understanding The Motivational Effects of Transformational Leaders." *Academy of Management Journal* 46: 554–571.
- Burns, J. 1978. *Leadership*. New York: Harper and Row.
- Chen, C., H. Li, and Y. Tang. 2009. "Transformational Leadership and Creativity: Exploring the Mediating Effects of Creative Thinking and Intrinsic Motivation." *International Journal of Management and Enterprise Development* 6 (2): 198–211.
- Dirks, K., and D. Ferrin. 2002. "Trust in Leadership: Meta-Analytic Findings and Implications for Research and Practice." *Journal of Applied Psychology* 87 (4): 611–628.
- Duffy, F. 2006. *Power, Politics, and Ethics in School Districts: Dynamic Leadership for Systemic Change, Leading Systemic School Improvement*. Lanham, MD: Rowman & Littlefield Publishing Group. ISBN-13: 978-1578863181.
- Ha-Vikström, T., and J. Takala. 2016. "Knowledge Management and Analytical Modelling for Transformational Leadership Profiles in a Multinational Company." Chap. 11 in *Successes and Failures of Knowledge Management*, edited by Jay Liebowitz, 151–174. Cambridge: Morgan Kaufmann/Elsevier. ISBN: 978-0-12-805187-0.
- Jung, D., and B. Avolio. 1999. "Effects of Leadership Style and Followers' Cultural Orientation on Performance in Group and Individual Task Conditions." *Academy of Management Journal* 42: 208–218.
- Kazmi, S., J. Takala, and M. Naaranoja. 2015. "Sustainable Solution for Competitive Team Information." *Journal of Global Strategic Management* 9 (1): 5–16
- Kirkpatrick, S. and E. Locke. 1996. "Direct and Indirect Effects of Three Core Charismatic Leadership Components on Performance and Attitudes." *Journal of Applied Psychology*. 81: 36–51
- Nissinen, V. 2001. "Military Leadership: A Critical Constructivist Approach for Conceptualizing, Modelling and Measuring Military Leadership in the Finnish Defence Forces." PhD diss., National Defence University, Helsinki.
- Nissinen, V. 2006. *Deep Leadership*. 2nd ed. Hämeenlinna: Talentum Oy.
- Podsakoff, P., S. MacKenzie, R. Morrman, and R. Fetter. 1990. "Transformational Leader Behaviors and Their Effects on Follower's Trust in Leader Satisfaction, and Organizational Citizenship Behaviors." *Leadership Quarterly* 1: 107–142.



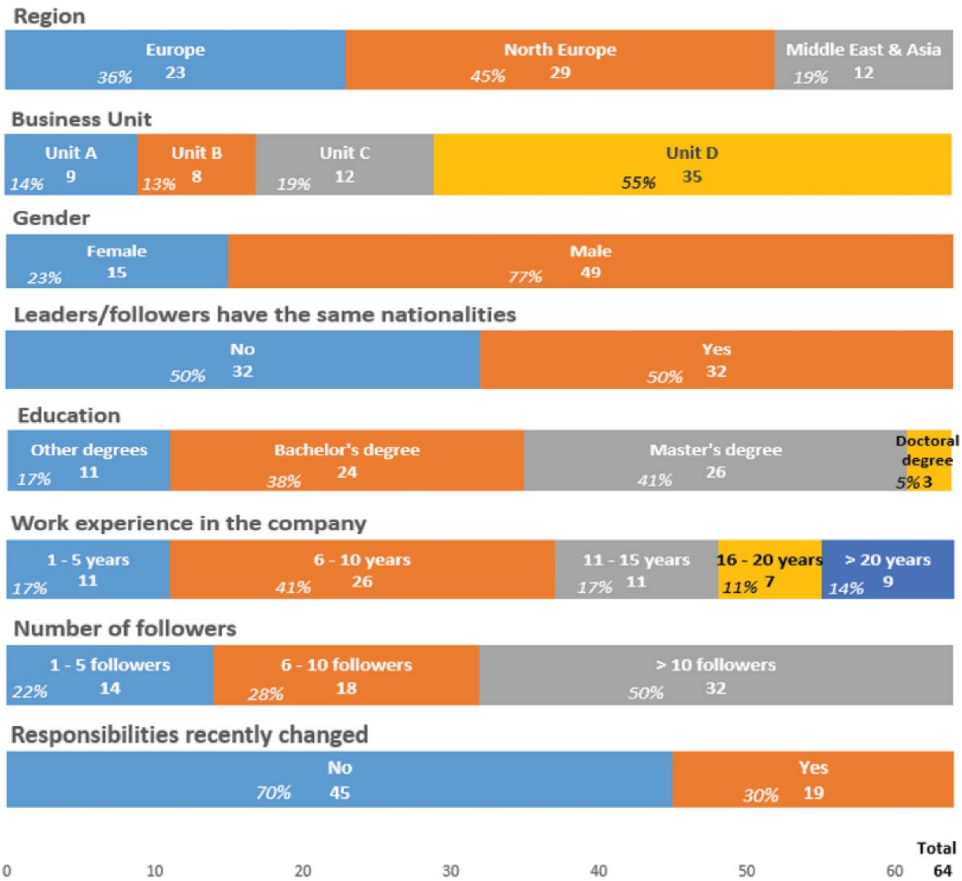
- Progen, M. 2013. "Dynamic Leadership." Leadership Writing Contest entry. MarineCorps Association and Foundation. Accessed March 2016. <https://www.mca-marines.org/gazette/dynamic-leadership>
- Saaty, T.L. 1982. *Decision Making for Leaders. The Analytical Hierarchy Process for Decisions in a Complex World*. Belmont, CA: Wadsworth. Latest ed. revised 2000. Pittsburgh, PA: RWS Publications.
- Saracoglu, B. 2013. "Selecting industrial investment locations in master plans of countries." *European Journal of Industrial Engineering* 7 (4): 416–441.
- Schaubroeck, J., S. Lam, and S. Cha. 2007. "Embracing Transformational Leadership: Team Values and the Impact of Leader Behavior on Team Performance." *Journal of Applied Psychology* 92: 1020–1030.
- Statistics and Probability Dictionary. 2016. Accessed February 20. <http://stattrek.com/statistics/dictionary.aspx?definition=statistics>
- Takala, J., H. Hirvelä, P. Hiippala, and V. Nissinen. 2005. "Management and Deep Leadership Sand Cone model for Human Resource Allocation, The First Phase of the Study." Paper presented at the Fourth International Automation and Manufacturing Conference, ATDC (Advanced Technologies for Developing Countries), Slavonski Brod, Croatia, September 21–24.
- Takala, J., H. Hirvelä, P. Hiippala, and V. Nissinen. 2006a. "Management and Deep Leadership Sand Cone Model for Human Resource Allocation, The Second Phase of the Study." Paper presented at the Eleventh International Conference on Productivity and Quality Research, ICPQR. December 12–15. New Delhi, India. International Conference on Multinational Enterprises—Multinational Enterprise in the Global Economy, March 14–16, 2006, Taipei, Taiwan.
- Takala, J., J. Leskinen, H. Sivusuo, J. Hirvelä, and T. Kekäle. 2006b. "The Sand Cone Model: Illustrating Multi-Focused Strategies." *Management Decision* 44 (3): 335–345.
- Takala, J., A. Kukkola, and J. Pennanen. 2008a. "Prospector, Analyzer and Defender Models in Directions of Outcome in Transformational Leadership." Paper presented at the 17th International Conference on the Israel Society for Quality, ISAS 2008. November 18–20. Jerusalem, Israel. The 10th Management International Conference, MIC 2009, November 25–28, 2009, Sousse, Tunis.
- Takala, J., J. Pennanen, P. Hiippala, A. Maunuksela, and O. Kilpiö. 2008b. "Decision Maker's Outcome as a Function of Transformational Leadership." In *Simplify Leadership and Coaching Effectiveness*, edited by T. Kinnunen, 67–86. Lahti: Deep Lead Oy, Aldus Oy.
- Williams, L. 1998. *Servants of the People: The 1960s Legacy of African-American Leadership*. New York: St Martin's Press.

**Appendix 1. Participants' locations and nationalities**

No.	Participants' locations	n
1	Cameroon	1
2	China	6
3	Denmark	2
4	Estonia	1
5	Finland	25
6	France	3
7	Germany	8
8	GREECE	3
9	India	7
10	Italy	4
11	Netherlands	2
12	Norway	2
13	Pakistan	1
14	Poland	3
15	Saudi Arabia	1
16	Sweden	3
17	Taiwan	1
18	Turkey	2
19	United Arab Emirates	4
20	United Kingdom	6
21	United States	1
	<b>Total</b>	<b>86</b>

No.	Participants' nationalities	n
1	British	5
2	Cameroonian	1
3	Chinese	7
4	Danish	2
5	Dutch	3
6	Estonian	1
7	Finnish	25
8	French	3
9	German	8
10	GREEK	3
11	Indian	11
12	Italian	4
13	Norwegian	2
14	Pakistan	1
15	Polish	4
16	Swedish	4
17	Turkish	2
	<b>Total</b>	<b>86</b>

## Appendix 2. Collection of usable data from the survey



**Note:** This figure represents the collection of **usable data** in eight categories. The number display under each group (e.g. 23 in group Europe) is the total participants in group Europe, and the percentage in *Italic*, for example 36% is the percentage of respondents in group Europe (23/64). 64 is the total number of the usable responses.

## Appendix 3: Transformational leadership sand cone traffic light values

Directions of outputs/optimal 33%

- 50–100 (red)
- 40–50 (yellow)
- 20–40 (green)
- 10–20 (yellow)
- 0–10 (red)

Cornerstones/optimal 25%

- 40–100 (red)
- 30–40 (yellow)
- 20–30 (green)
- 10–20 (yellow)
- 0–10 (red)



**Appendix 5: A sample of an equation control test**

	1	2
TOTAL of ABS diff.	1	
TL index	-1	1

**Note:** Total of ABS diff = Total of absolute difference.  
TL index = Transformational leadership index.