

IDENTIFICATION OF RELATIONSHIP BETWEEN THE KRAV MAGA SELF-DEFENCE SYSTEM AND THE TRANSFORMATIONAL LEADERSHIP USING PRINCIPAL COMPONENT ANALYSIS

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Abstract

In today's age of globalization, rapid advances in technology, and rapid change at all levels, employees, managers, and leaders must achieve corporate goals and contribute as much as possible to the success and reputation of the organization. Critical thinking, the importance of a wise approach, quick reactions, out-of-the-box thinking, and the need to make sometimes difficult decisions to effectively overcome the situation they face together with ability to communicate effectively and motivate and inspire employees to achieve more than the estimated personal maximum are the key competencies of today's leaders. Lessons on principles, skills, tactics and values of martial arts and combat systems can be a useful tool in upgrading models of effective corporate governance and personal empowerment, and thus contribute to leadership skills development. This paper investigates the connection between the adopted values, skills and tactics of the Krav Maga self-defense system and the characteristics of the respondents' leadership competency in relation to the aggregate variables self-regulation, self-perception and environmental awareness. The data were collected during March 2021 using web-based anonymous questionnaire from a deliberate sample of active athletes practicing Krav Maga system from a total of 22 countries (N = 98, F = 36). The quantitative methodological approach was used. In order to linearly reduce the dimensionality of variables, the principal components method (PCA) was used. The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) and Bartlett's test of sphericity (BTS) were conducted (KMO = 0.848; $p = 0.000$) for testing the data appropriateness. Three components were extracted which accounted for 95.064 % of the total variance from the 30 particles of variable V16. Component 1 can be renamed as "Engagement"; component 2 can be renamed as "Moral values and work-energy" and component 3 can be renamed as "Supportive behavior". In this sample of respondents, the findings demonstrated that it is possible to extract the values, skills and qualities (competencies) that describe the leader, but also the engaged employee, which is characteristic in highly effective organizations. These acquired competencies can be described as immanent traits/traits that can be adopted, i.e. further developed through the Krav Maga system training. Seeing the global scarcity of quantitative research in the context of interrelationship between the values and tactics of Krav Maga system and the leadership competencies development, it can be said that the results expand insights into this problem and can be used as a basis for future, more complex research.

Keywords: Change management skills, Krav Maga system; principal component analysis, transformational leadership.

1 INTRODUCTION

1.1 Transformational leadership

The leadership phenomenon raised a higher level of interest in the scientific research circles from the mid-20th century. However, the obtained results are still not completely consistent. Hierarchical position is not crucial for leadership, as the leadership approach can be seen among people outside the hierarchical structure in an organization. In modern studies, the research focus on successful leader characteristics is shifted from the focus on his/her innate qualities [1],[2] to the leader's skills, competencies and attitudes primarily in everyday communication skills, ability to act, persuasion skills and high moral values and ethics [3-7]. In this context, leadership is defined as a process of social interaction in which the leader strongly influences the behavior of his/her followers in terms of increasing their performance [8] or as the art of persuading people to work on a common goal or organizational goals [9 -11].

Compared to the leadership style of an organization in which employees set their own goals and means to achieve them, and the leader avoids power and responsibility in the process (*Laissez - faire* leadership) [11],[12] or a style based on the exchange relationship of a leader with his/her employees

or followers (transactional leadership) [14],[15], transformational leadership is considered in many respects to be the optimal leadership style [2],[14]. It is based on common principles, norms and values, in which leaders through the dimensions of mentoring, intellectual stimulation, inspirational motivation and empathy encourage and support the transformation of their associates towards higher levels of engagement, positive organizational culture and greater efficiency [14],[16],[17]. Transformational leadership goes beyond short-term goals and offers employees a focus on the essential as well as gaining a broader picture while setting challenging goals based on an individual's specific needs and capabilities. Such leadership is focused on quick response to changes; it is essential for the development and survival of organizations in times of turmoil, where strategic changes need to be made to address the main threats and seize opportunities [2],[11],[14],[17-19].

In the context of this paper, transformational leaders are expected to demonstrate ability in self-awareness, self-regulation, self-motivation, self-awareness, empathy and social skills [9]. Self-awareness represents the experience of one's own feelings in form that they appear, and when they appear. Self-awareness is based on intuition and instincts and is key to emotional intelligence; it allows defining personal strengths and limitations as well as adopting a sense of humility, which will allow them to accept shortcomings in order to improve their own competencies [20-26]. Self-regulation is a construct that represents the ability to monitor and control one's own behavior in order to respond to social expectations. Self-regulation includes not only initiating the achievement of goals, but also avoiding distractions from the environment and emotional impulses that could interfere with a person's progress or making emotional, hasty decisions. People have the ability of self-motivation: to set personal goals, plan strategies, evaluate, and modify current behavior [6],[27],[28]. Empathy is a cognitive understanding of another person's feelings and position; it is an important prerequisite for communication within the organization, and enables the leader to successfully motivate, lead and manage. Social skills could be defined as specific ability to turn knowledge into action, which leads to effective change management in and around the organization and in conflict resolution [10,28]. Situational awareness is the perception of elements in environment within a certain time and space, and it is important for understanding their meaning and predicting their status in near future. Our knowledge, experience, training and education allow us to understand what is going on around us and help us identify potential danger related to actual physical danger or danger related to our potential business decisions [29],[30].

1.2 Martial arts and cultivation of positive changes

The value of ancient martial arts is recognized in today's civil society because of their developmental benefits for the individual - they develop motor skills and facilitate the adoption of certain techniques that can improve people's life quality and strengthen capacities and qualities such as perseverance, concentration, self-control, and patience [31],[32]. Martial arts differ from regular physical activities and have been empirically confirmed to have positive effects on self-esteem and self-confidence, on better regulation of aggression and feelings of vulnerability, and additionally they reduce sleep disorders and depression [33-36]. In the context of strengthening the skills that we associate with leadership, certain martial arts (aikido, kung fu, karate) are used to achieve an individual's self-realization and peaceful resolution of conflict situations [37],[38], improve communication and negotiation skills [39],[40] and raise levels of self-awareness and moral values. It is worth mentioning, for the purposes of this paper, a number of studies in active martial arts practitioners (taekwondo, karate and aikido) which measured a positive relationship between improving skills and qualities that construct self-respect, self-esteem, self-regulation, self-perception together with their successful implementation in the work environment [39],[40] [41],[42],[43].

1.3 Self-regulation and environmental awareness in the scope of Krav Maga

Krav Maga is a tactical system by which we can spot, prevent and resolve almost any type of violence, attack or conflict. It is a modern, practical and experience-tested Israeli system of self-defense and close combat based on principles and concepts from real life situations. Its success comes from the fact that it is based on principles instead of the technique. These principles are: *be aware of yourself; be aware of the danger and your surroundings; never exchange one danger for another; solve the immediate danger; use techniques that are easily performed, regardless the circumstances* [29],[44]. The values of the Krav Maga system are to educate and build people mentally, spiritually and physically, so when necessary, they are able to defend themselves from any attack quickly and efficiently. In that context the Krav Maga system tactics develop character traits, skills and values such as integrity, ethics, humility, peacefulness, non-violence, self-awareness, discipline, respect, responsibility, situational

awareness, active listening and ability to function in stressful situations. The basic Krav Maga training techniques consist of two to three activities, which are based on natural responses to danger. Training techniques and methods highlight the ability of self-regulation, in terms of functioning in a conflict from a worse position, and a willingness to immediately switch from passive to active status in order to defend ourselves. The same pattern can be used during a stressful communication within an organization, which can equally be experienced as a verbal attack, and in such way, there can be a shift from victim's position to a position of equal communication level in which an acceptable solution can be found on both sides - the so-called win-win solution [29],[30],[45],[46]. By assessing the situation and reacting appropriately, a person can achieve a high degree of control over their safety as well as over his/her decisions, actions and activities. Krav Maga recommends proactive action in matters of safety, a principle that is equally important in business and leadership [29,30].

The importance of verbal and nonverbal communication in the Krav Maga defense system as well as the connection between communication skills developed through Krav Maga system training and successful change management in organizations have been written in more detail in previous articles by the same co-authors [47]. However, it should be noted that there are, within the population of people who are actively engaged in Krav Maga training, those who use their personal development, although not managers, and equally contribute and improve the characteristics of positive change in their work environment by applying qualities and values adopted through Krav Maga training. That is why the empirical study was conducted on a general sample of respondents.

2 METHODOLOGY

This paper explores the connection between the adopted values, skills and tactics of the Krav Maga self-defense system and the characteristics of the respondents' leadership competence. In relation to the defined research purpose and goals, we set out the research question RQ1: Can we identify a link between adopted values, skills and tactics of Krav Maga's system and the characteristics of the participant's leadership competencies in relation to aggregate variables: a) self-regulation; b) self-perception, and c) environmental awareness?

The research makes an integral part of the co-author student's graduate paper within the graduate study of Public Relations at State University North in Croatia.

2.1 Methods

The data were collected in the period 8 - 14 March 2021 using web-based anonymous questionnaire from a deliberate sample of active athletes practicing various international schools of the Krav Maga system from a total of 22 countries (N = 98, F = 36). Previously conducted research from the literature was used as a variable layout. The variables were to an extent adjusted to the research objectives. A questionnaire was created which, in addition to general information on the respondents also collected information on Krav Maga values, skills and tactics, leadership qualities and communication skills. The questionnaire used a combination of open-ended (N = 3), closed-ended questions (N = 9) and scale questions (N = 7). Variables V11-V17 represent the statements expressed in form of scales in the questionnaire, where 1 indicates the lowest degree of respondent's agreement and 10 the highest degree of respondent's agreement with the mentioned statement. The quantitative methodological approach was used. The IBM SPSS Statistics version 27 package was used. For this paper the obtained data were processed by multivariate method Principal component analysis (PCA).

2.1.1 Sample

The sample consists of respondents (Krav Maga athletes) who answered all the questions from the online survey questionnaire in English, which was created using Google Forms. In this sample, most respondents belong to the mature age group (30.6% is in the range 41-45 years old; 20.4% are in the range of 46-50 years old) then middle adults (23.5% is 36-40 years old), while those younger than 35 years and older than 51 years are less represented. Among the respondents, higher education level is dominant (EQF 7 level (49.0%) and EQF 6 (25.5%)), and the smallest number has the educational level EQF 4 (3.1%). In relation to the working position, for the purpose of the analysis, the categories were recoded into managerial (53.9%) and non-managerial positions (46.1%). According to working experience, the most numerous respondents are in the categories 21-25 years of work experience (26.5%) and those between 11-15 years of work experience (24.5%), i.e., between 16-20 years of work experience (20.4%), which corresponds to the stated respondents' age. Other categories are less represented, where there are the least of those with more than 35 years of work experience (2%). Among

the respondents, most of them have trained for 4-5 years (28.6%), i.e., up to 10 years (24.5%), and the smallest number is of those who have trained for 16-20 years (2%). Respondents are predominantly students of the Krav Maga Global School (70.4%) and the International Krav Maga Federation (25.5%). In this sample, only 13.3% of them have not (yet) achieved any of the levels, i.e., belts within the Krav Maga system.

3 RESULTS

The need to reduce the number of variables in order to identify crucial values has appeared, i.e., to identify qualities that lead to successful change management and can link the core values and skills of Krav Maga system of close combat and self-defense with competencies of modern corporate environment leaders. The principal component method (PCA) using IBM SPSS Statistics v27 package was used to linearly reduce the number of variables on individual measurement scales of V11-V17 ranking variables, and mostly very simple structured components were extracted.

Table 1 Rotated component matrix– rank scale survey variables V11-V17.

	<i>Variable</i>	<i>Component (N)</i>	<i>Eigenvalue's variance (%)</i>
V11	I fully understand and can evaluate the stated values, skills and tactics of the Krav Maga system of self-defense and close combat in all aspects of my life.	1	29.905
V12	I have fully adopted the stated values, skills and tactics of the Krav Maga system of self-defense and close combat in all aspects of my life.	1	28.486
V13	I fully apply the stated values, skills and tactics of the Krav Maga system of self-defense and close combat in all aspects of my life.	2	28.234 (C 1) 1.055 (C 2)
V14	I fully understand and can evaluate the stated values, skills and strategies of my work/professional environment.	1	28.662
V15	I fully apply the following value, skills and strategies of my work/ professional environment.	2	27.176 (C 1) 1.083 (C 2)
V16	I can fully relate the stated values, skills and strategies that I personally apply in the work/professional environment with the training of the Krav Maga system of self-defense and close combat.	3	26.196 (C 1) 1.280 (C 2) 1.044 (C 3)
V17	I think that due to Krav Maga training I have further developed the following qualities in my work / professional environment:	2	27.882 (C 1) 1.073 (C 2)

Given the variable V16: I can fully relate the stated values, skills and strategies that I personally apply in the work/professional environment with the training of the Krav Maga system of self-defense and close combat, initially there were 3 components extracted, and the respondents' answers received on variable V16 represent the most significant answers in terms of achieving research goals.

Table 2 KMO and Bartlett test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.848
Bartlett's Test of Sphericity	Approx. Chi-Square	8975.434
	df	435
	Sig.	.000

The value of the Kaiser-Mayer-Olkin Measure of Sampling Adequacy must be greater than 0.60 [48] in order to correctly implement the PCA method. The Bartlett sphericity test [49] must be statistically significant to confirm the factorability of the data, and this condition was met (KMO = 0.848; $p = 0.000$) (Table 2).

Using the Varimax method, a rotated component matrix was obtained (Table 3) in which 3 main components were extracted, for which the initial characteristic values amounted to 95.064% of the total variance for 30 particles of the V16 scale (Figure 1). The obtained main components were further rotated

using 11 iterations of the Varimax method (Figure 2). All 3 main extracted components are considered statistically significant for the purposes of this paper, and they will be interpreted.

Table 3 Rotated component matrix - V16.

V16 - particles	Component		
	1	2	3
[Self-confidence]	.837		
[Ability to act under stress]	.833		
[Self-consciousness]	.813		
[Ability to cope with stress]	.809		
[Prevention]	.789		
[Situational analysis]	.751		
[Self-esteem]	.748		
[Ability to adapt]	.734		
[Intuition (situational awareness)]	.693		
[Self-motivation]	.678		
[Communication skills]	.661		
[Active listening]	.639		
[Focus]		.757	
[Ethics]		.749	
[Self-perceiving]		.747	
[Assertiveness]		.746	
[Persistence]		.745	
[Supervision]		.743	
[Self-regulation]		.737	
[Integrity]		.734	
[Humility]		.726	
[Respect]		.719	
[Responsibility]		.717	
[Self-efficiency]		.665	
[Empowerment]		.663	
[Delegation]			.842
[Intellectual simulation]			.834
[Empathy]			.772
[Innovation]			.749
[Inspiring/Motivation]			.656

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.^a

Rotation converged in 11 iterations.

Component	Total	Initial Eigenvalues		Rotation Sums of Squared Loadings		
		% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	26.196	87.319	87.319	10.723	35.744	35.744
2	1.280	4.266	91.585	10.246	34.155	69.899
3	1.044	3.479	95.064	7.550	25.165	95.064
4	.480	1.600	96.664			

Figure 1. Total variance explained – V16.

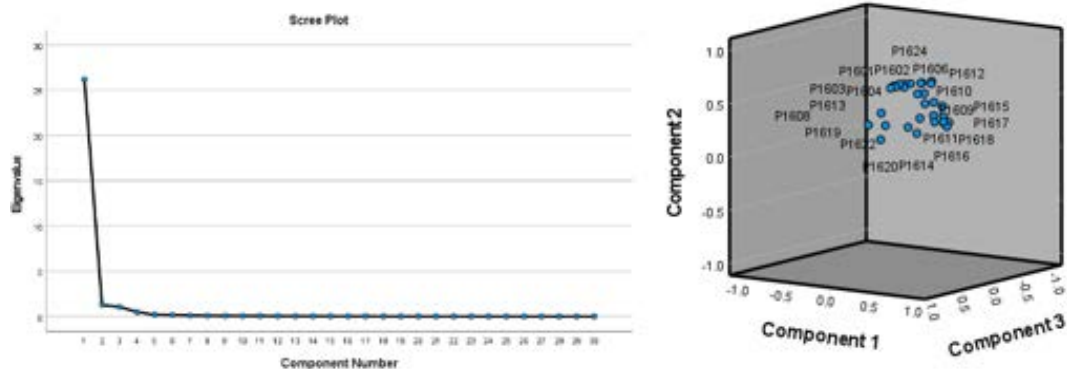


Figure 2 Diagram of characteristic component values (line and rotated space) - V16.

3.1 Component 1: Engagement

This component includes 87.319% of the total quality variance which the respondents apply in their working environment based on Krav Maga system training. In the process of naming the component 1, induction was used to extract, from a large number of particles that comprise the component, the following: *self-confidence (0.837)*; *ability to act under stress (0.833)*; *self-awareness (0.813)*; *ability to cope with stress (0.809)*; *prevention (0.789)*; *situational analysis (0.751)*; *self-perception (0.748)*; *adaptability (0.734)*; *intuition/situational awareness (0.693)*; *self-motivation (0.678)*; *communication skills (0.661)*; *active listening (0.639)*. Based on those components, group variables were formed in the first step: *self-perception, resilience, situational flexibility, communication skills, and self-motivation*, based on which component 1 is called Engagement. All the described particles also compose the construct of employee engagement, and certainly the qualities of highest-level leaders, which is in line with previous research according to which employee engagement is a crucial component of efficient organizations. Engaged employees are “individuals who are highly energized and firm in doing their job, who put their heart into the job they do, show perseverance and willpower as well as strong involvement while experiencing a sense of importance, enthusiasm, passion, inspiration, pride, excitement and challenge” that inspires and leads people from their professional [49] and sports environment [38].

3.2 Component 2: Moral values and work-energy

This component includes 4.266% of the total variance traits that respondents apply in the work environment based on Krav Maga system training. The component is composed of particles: *focus (0.757)*; *ethics (0.749)*; *self-perception (0.747)*; *assertiveness (0.746)*; *persistence (0.745)*; *supervision (0.743)*; *self-regulation (0.737)*; *integrity (0.734)*; *humility (0.726)*; *respect (0.719)*; *responsibility (0.717)*; *self-efficiency (0.665)*; and *empowerment (0.663)*. This component contributes to further clarification of the necessary qualities that make a leader in his/her relation to others but also in self-perception and self-regulation by which a high-quality leader constructs himself/herself in an effective business environment. Therefore, component 2 is called Moral values and work-energy. Efficient leaders have the ability to precisely regulate their feelings and actions. By using self-regulation, leaders can avoid making emotional, hasty decisions. In addition, self-regulation allows leaders to avoid stereotypes and verbal attacks on their followers, that is employees. Moreover, self-regulation is demonstrated through the leaders' flexibility and their ability to remain committed to their values and individual responsibility [24],[28].

3.3 Component 3: Supportive behavior

This component includes 3.479% of the total variance traits that respondents apply in the work environment based on Krav Maga system training. The component is composed of particles: *delegation (0.842)*; *intellectual stimulation (0.834)*; *empathy (0.772)*; *innovation (0.749)* and *inspiration/motivation (0.656)*. This component is in line with research on the characteristics of high-level leaders' attitudes towards employees in terms of encouraging and supporting the development of responsibility and a sense of participation in all processes and managing effective organizational change and in terms of a competent Krav Maga leader [10],[13],[38],[40]. Therefore, component 3 is called Supportive behavior. It should be noted that this component is strongly associated with the concept of transformational leadership. Furthermore, it is important to point out, within the main theses of this paper, that

transformational leadership is based on values. A leader sets high standards and purpose for his/her employees, motivates them by his/her own example, cooperation and trust. The goal of this kind of leadership is to respond quickly to change and bringing out the best in co-workers. Such leadership is change-oriented and is crucial to the development and survival of organizations in times of turmoil when strategic changes need to be made to address both major threats and at the same time seize opportunities [13-14].

4 CONCLUSIONS

This paper researches the relationship between two sets of qualities and characteristics defined within a set of values, skills and tactics, that is strategies attributed to the competencies of the Krav Maga system as well as competencies identified as leadership competencies, in terms they are being assessed by respondents in relation to their personal and work environment. Based on the above mentioned, the analysis of the principal components obtained in this sample of respondents identified the relationship between the adopted values, skills and tactics of Krav Maga system and characteristics of participants' leadership competencies in relation to the following group variables: self-regulation, self-perception and environmental awareness. All the mentioned gives an answer to the research question RQ1. Furthermore, based on everything presented so far, and in relation to the set purpose and goals of this paper, this sample of respondents demonstrated the possibility of deriving values, skills and qualities (competencies) that describe a leader, as well as an engaged employee, which is characteristic for highly efficient organizations. The acquired competencies can be described as immanent qualities/traits that can be adopted, that is further developed through the Krav Maga system training of self-defense and close combat.

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