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THE IMPACT OF FORMAL VERSUS INFORMAL REWARDS IN A MILITARY ORGANIZATION

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Abstract

During our life time, we experience situations in which we must motivate or be motivated, to overcome the challenges. We learn what tools to use and how to do it, by observing what our parents or elders do, or by the education we receive. Most organizations have formal motivating systems, which consist of formal rewards and guidance, when and how these tools should be used, by whom and towards whom. Leaders' personal know-how reveals that besides the formal rewards, there are informal rewards that might be used to motivate employees, which augment the formal rewarding system. These informal rewards are derived from the structural improvement of the organization, are adapted in accordance with the managerial conduct and act as an interface between employees' queries and their supervisors' good will. Nevertheless, they are mostly used for situations which are not covered by the formal rewarding system or, when an informal reward might better fulfill employees' needs. The aim of this paper is to understand if the use of informal rewards influences the use of the formal ones within a military organization, using the cluster method of the Analytic Hierarchy Process (AHP).

***Keywords**: motivation, clusters, AHP, consistency, perception, military, formal rewards.*

1. Introduction

Rewards in an organization are granted by managers, in accordance with the available pools, both formal and informal, and their desired outcome. According to Poleanschi [4], there is a degree of subjectivity when granting rewards, especially due to the individual perception of the presumable outcome. In order to understand the influence of the informal over the formal awards, the research was based on Saaty's cluster method [3]. Formal rewards were treated as random variables with attached priority vectors, using decisional matrices with consistency indexes, to which a parallel computation of consistency index was performed, according to Benitez [1].

2. Formal versus informal rewards: Clusters setting

Informal rewards augment formal ones in unperceived ways, depending on the formal versus informal interchange. While some agreement can be achieved on the way formal and informal rewards are grouped in clusters, yet the order of importance inside clusters, clusters' sequence and the choice of the pivots, are definitely a result of the differences in the perceived importance of formal versus informal rewards, among the decision makers.

Formal rewards were arranged into two clusters (F1, F2), ascending in accordance with their official recognized importance. In Poleanschi (2013), the importance order of each formal reward was asserted through the consideration of a hierarchy and the outcome, the perceived importance derived in that specific context, partly matched the order of importance as set by regulations [4]. Nevertheless, in this paper the order of the items

within every cluster of formal rewards is kept fixed, following the recognized importance assigned in the official regulation, as presented in Table 2.1.

F1				F2			
F1-1	F1-2	F1-3	F1-4	F2-5	F2-6	F2-7	F2-8

F1-1 Appreciations
F1-2 Felicitations
F1-3 Diploma of excellence
F1-4 Citation in the official log
F2-5 Money or personal items
F2-6 Special ribbons
F2-7 Small arms
F2-8 Medals

Table 2.1 Formal Rewards Clusters

The list of the informal rewards, as well as their position within clusters (I1, I2) was agreed among a number of twenty experts with significant experience as decision makers and it is shown in Table 2.2.

I1				I2			
I1-▲	I1-►	I1-▼	I1-◄	I2-♣	I2-♠	I2-♥	I2-♦

I1-▲ Complex task assignment
I1-► Project management
I1-▼ Development courses
I1-◄ Share of personal experience
I2-♣ Appeal for promotion
I2-♠ Leadership education
I2-♥ Function promotion
I2-♦ Rank promotion

Table 2.2 Informal Rewards Clusters

Unlike formal rewards, the weight of importance, in terms of rewards effectiveness and increased motivation among subordinates, is prone to significant subjective variations. This justifies why arbitrary symbols instead of numbers, were assigned to distinguish among each informal reward. Items' order in clusters, succession of formal and informal clusters and pivot's selection were decided by the experts, divided into four teams. The succession of the informal and formal rewards' clusters and the pivots, within the four alternatives (A1 to A4) is depicted in Table 2.3.

A1		A2		A3		A4	
F1	F1-1 0.21	I1	I1-▲	I1	I1-▲	F1	F1-1
	F1-2 0.05		I1-►		I1-►		F1-2
	F1-3 0.57		I1-▼		I1-▼		F1-3 0.55
	F1-4 0.03		I1-◄		I1-◄		F1-4
	I1-▲ (pivot)		F1-1(pivot)		F1-1(pivot)		I1-▲ (pivot)
I1	I1-▲ 0.12	F1	F1-1	F1	F1-1	I1	I1-▲
	I1-► 0.25		F1-2		F1-2		I1-►
	I1-▼ 1.23		F1-3 0.14		F1-3 0.17		I1-▼
	I1-◄ 0.52		F1-4		F1-4		I1-◄
	F2-5 (pivot)		F2-5 (pivot)		I2-♠(pivot)		I2-♠ (pivot)
F2	F2-5 3.07	F2	F2-5 0.36	I2	I2-♠	I2	I2-♠
	F2-6 3.29		F2-6		I2-♣		I2-♣
	F2-7 3.07		F2-7		I2-♥		I2-♥
	F2-8 3.41		F2-8		I2-♦		I2-♦
	I2-♣ (pivot)		I2-♠ (pivot)		F2-5(pivot)		F2-5(pivot)
I2	I2-♣ 16.97	I2	I2-♠	F2	F2-5 1.73	F2	F2-5 3.66
	I2-♠ 16.97		I2-♣		F2-6		F2-6
	I2-♥ 109.61		I2-♥		F2-7		F2-7
	I2-♦ 309.66		I2-♦		F2-8		F2-8

Table 2.3 Alternatives and clusters

At this point, it is worth mentioning that the cluster method, as in Saaty (2011), is adapted to the versatile value of the pivot in the informal rewards' clusters. When considering intangible sets like informal rewards, the pivot weight of importance does not

necessarily take the highest or the smallest numerical value within its cluster. Yet, the inference of the assigned importance of the pivots, from one cluster to the next one, was done after the weights of importance within a cluster were normalized by their division to the correspondent minimum weight.

The weighted importance of the items within A1 is depicted with two decimals on the second column in Table 2.3, while selective values for two of the formal and informal rewards are respectively reported in the next columns of this table. For quantifying the sensitivity in the weights of importance, asserted to a certain formal reward along the four alternatives considered, as a result of different informal rewards' reinforced effect over the formal ones, every formal reward was thought to be modeled by a random variable, whose four realizations are the four correspondent values in the priority vectors, derived for each of the four columns in the previous table.

For simplicity, the random variable will keep the same notation as the one used for the formal reward. If for a formal reward F, there are four values available (f_{A1}, f_{A2}, f_{A3}, f_{A4}), corresponding to the four alternatives A1 to A4, the correspondent random variable would be

$$F: \begin{pmatrix} f_{A1} & f_{A2} & f_{A3} & f_{A4} \\ p_1 & p_2 & p_3 & p_4 \end{pmatrix}$$

The probabilities in the second row are derived as follows. For each alternative $(A_i)_{i=1,\dots 4}$, it is counted the percentage of times $p_i^{preferred}$ in which the formal reward F was preferred against other formal or informal rewards. The probabilities in the second row represent the normalized counterparts of the vector, formed by the percentages calculated above. The mean of the random variable F is interpreted as an average value expressing the importance of the formal reward F, against the alternatives considered. The variance of the random variable F is interpreted as a sensitivity indicator of the mean to the grouping order within the clusters, and represents how important is the influence of the informal rewards over the formal ones, as a result of the rewards' perceived importance and location.

3. The impact of cluster setting on the perceived importance of rewards in a military organization: An experiment.

For each decision matrix enclosed in clusters, the Consistency Index (CI) was computed together with the associated priority vector (PV). Since over the collaborative discussions, a satisfactory consensus did not yield an acceptable CI value, the closest consistent decision matrix was derived and the corresponding priority vector recalculated, as in Benitez (2011). This manner of achieving consistency is further referred to as "Bold Consistency". The consistency index for the original decision matrices, F1 to I2 in alternative A1 are shown on the first column in the Table 3.1.

$A1^{BC}$			A1		
$F1^{BC}$	F1-1	0.21	F1	F1-1	0.21
	F1-2	0.05		F1-2	0.05
	F1-3	0.57		F1-3	0.57
CI = 0	F1-4	0.03	CI = 0.28	F1-4	0.03
	I1-▲	(pivot)		I1-▲	(pivot)
$I1^{BC}$	I1-▲	0.12	I1	I1-▲	0.12
	I1-►	0.24		I1-►	0.25
	I1-▼	1.20		I1-▼	1.23
CI = 0	I1-◄	0.51	CI = 0.42	I1-◄	0.52
	F2-5	(pivot)		F2-5	(pivot)
$F2^{BC}$	F2-5	3.00	F2	F2-5	3.07
	F2-6	3.25		F2-6	3.29
	F2-7	3.00		F2-7	3.07
CI = 0	F2-8	3.38	CI = 0.98	F2-8	3.41
	I2-♣	(pivot)		I2-♣	(pivot)
$I2^{BC}$	I2-♣	18.92	I2	I2-♣	16.97
	I2-♠	18.92		I2-♠	16.97
CI = 0	I2-♥	118.86	CI = 0.40	I2-♥	109.61
	I2-♦	335.77		I2-♦	309.66

Table 3.1 Priority Vectors and Consistency Index Values

The corresponding components of the extended priority vector, after the cluster method was inferred, are indicated in the second column of the Table 3.1. The fourth column reports the priority vector for the bold consistency (BC) versions of each priory decision matrices.

It is interesting to observe in figure 1 that the cumulated weight of importance for the informal rewards highly overpasses the one for the formal ones in three out of the four alternatives considered.

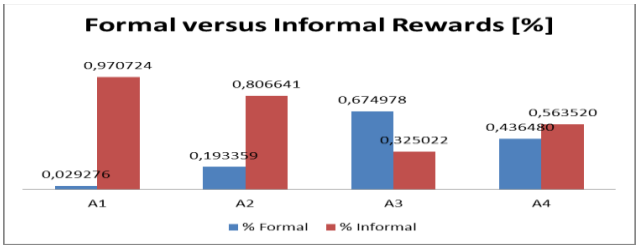

Fig 1 Formal vs. informal Rewards – cumulated weight of importance

In order to further detail the importance of formal and informal cluster setting, we analyze the clusters which had the closest values of the informal rewards, namely alternatives A1 and A2.

As an example, values of formal rewards show variations of cluster F2: “Medals” has the highest value in A1, while “Small arms” has the highest value in A2 (Fig. 2). As of informal rewards, “Rank promotion” exceeds all other formal and informal rewards, with an unexpected value of 309.66 in A1 and with 8.00 in A2.

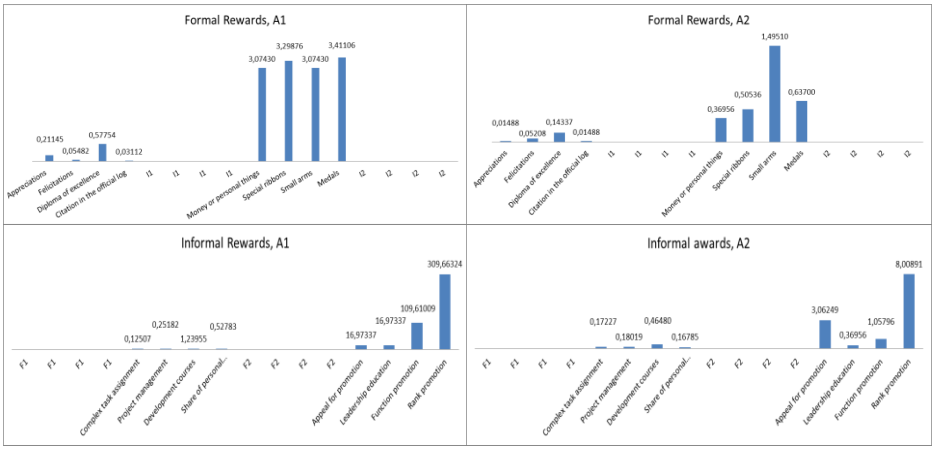

Fig. 2 Values of Formal and Informal Rewards – Alternative 1 and 2

The above numerical findings point towards two directions: first, the use of informal rewards does influence the perception over the formal rewards and, second, cluster setting within each alternative influences the perception over both formal and informal rewards. It also indicates, through the associated mean and variance values that, the higher the importance associated with the formal rewards, the higher the level of individual subjectivity in granting that reward (Fig. 3).

Formal Rewards	Mean	Variance
Appreciations	0,11160	0,00766
Felicitations	0,06220	0,00012
Diploma of excellence	0,38907	0,04075
Citation in the official log	0,00000	0,00000
Money or personal things	1,99200	1,75609
Special ribbons	3,96805	2,72041
Small arms	6,16791	24,49765
Medals	23,65129	461,33808

Fig. 3 Mean and Variance for Formal Rewards

3. Conclusion

This paper shows an experiment for measuring the influence of the informal rewards over the formal ones in a military organization. The analysis was performed by adapting the cluster method for intangible items as in Saaty (2011), when magnitude is not obvious. Whenever the decision matrices displayed an unsatisfactory Consistency Index, they were replaced by the closest consistent matrix as in Benitez (2011).

The priority vectors corresponding to the improved decision matrices, in terms of consistency, were very close to the priority vectors corresponding to the initial decision matrices. Whether this finding holds true for the particular decision matrices in this experiment or the result is more general, is a topic to be addressed in a future research. Informal rewards reinforce the formal ones in numerous ways and, in that perspective, experts divided into four teams identified different sequences in four alternatives.

The values among these four sequences for a particular formal reward were assumed to be realizations from a random variable that was modeling that formal reward. The associated probabilities were derived from the preference percentages of the considered item among the four alternatives. The comparative variances for the random variables modelling the formal rewards

were interpreted as sensitivity measures of the cluster grouping of the informal rewards among the formal ones.

The numerical results show a correspondence between the size of the mean and the size of the corresponding variance, in the sense that for a small mean values show incremental variances while for larger means correspond almost quadratic values of the associated variances. The interpretation associated with these findings is that when stakes are high, so is the degree of subjectivity embodied in decision makers' perception over the importance of the rewards. Secondary, these findings show that the cluster method adapted for intangible items is highly dependent on the perceptions associated to the content, the pivots and the succession of the considered clusters.

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