

Examination of the Correlation between Reward and Punishment Perception and Socio Demographic Variables¹

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Abstract

As a result of the competition that has been on an increase in recent years organisations are attaching importance to and making effort for the satisfaction of their employees. Due to the fact that employees spend a significant part of their lives at work, their jobs bear a psychological importance. Individuals' happiness at work affects their social and societal lives as well. Organisational justice may be defined as the perception of employees as to how salaries, rewards, punishments, and promotions would be implemented, how such decisions are made, or how the said decisions are communicated to the employees. Employees that work in an organisation having a perception of justice bear utmost importance in terms of their work satisfaction and the organisation's conducting efficient operations.

In organisations, reward and punishment system is implemented in order to increase the perception of justice and performance of the employees, and as a result, outcomes that motivate the employees are obtained. An accurate implementation of reward and punishment system is of importance. Rewarding the employees that perform their jobs well in organisations also set an example for other employees in addition to motivating the rewarded employees. In addition, a structure based on performance and merit is formed as well. Researches show that trust in organisations increases the collaboration between individuals and between individual and organisation, and thus improves commitment to the organisation, and that it enhances the will of employees to renew themselves. Organisational justice affects the trust of employees in their organisation and bears great importance in management.

This study investigates the correlation between sociodemographic characteristics and reward-punishment perception with Nonlinear Canonical Correlation Analysis. A correlation of about 56% was observed between reward-punishment perception and sociodemographic variable sets. The most significant variables in this correlation were established as "the fact that employees in this organisation cannot talk about their rights," "frequent concerns over possible punishments," "occasional thoughts about ungrounded charges," and "fearing from their superiors and employers." As a result of the examination of the categorisation of individuals in terms of their reward-punishment perceptions based on sociodemographic characteristics, reward-punishment perception levels of individuals at the age of 35 and above that are graduates of elementary school were observed as high. This also shows that the concerns over being unemployed are also at a higher level.

Keywords: Organisational justice, Nonlinear Canonical Correlation Analysis, sociodemographic variables.

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1. Introduction

Human beings are being rewarded or punished due to their works in both their occupational and private lives from the day they are born. The belief that lies behind the foundation of reward and punishment is attitudes and behaviours manifested by the individual to meet the norms and expectations of the environment they live in as much as possible.

Rewarding individuals that conduct their work as needed or better and punishing the ones that conduct inadequately or falsely can be beneficial in terms of bettering the work system. However, since implementing the reward and punishment system accurately would be difficult and relative, wrong applications would bring more harm than benefits.

While rewarding and punishing, criteria need to be set clearly and absolutely, and updating the said criteria, implementing them in the same manner and fairly for all the employees, punishments not being too strong so as to decrease performance, rewards being commensurate and accessible, rewards and punishments outcomes being shared openly with employees, teamwork being encouraged by rewards, and reward-punishment evaluation periods not being too long must all be borne in mind.

Employees may experience loss of motivation, dejection, and prospective professional future concerns due to the perceptions of unfair punishment they are given or unfair rewards to others. These thoughts may lead to such outcomes as employees not observing themselves belonging to the workplace or not being able to identify themselves with the institution where they work. Therefore, the productivity, motivation, and work satisfaction of employees may be noted as they are correlated with reward-punishment.

This study investigates the correlation between reward and punishment in organisations and socio demographic variables.

2. Method

Canonical correlation analysis is the general version of multiple regression analysis, and its objective is to obtain linear components of random variables of each cluster with maximum correlation and unit variance. Then a second compound pair is found that is independent from the former pair, with maximum correlation and unit variance. These procedures are carried on till obtaining a new linear compound pair in a number equal to the number of variables in small variable cluster (Güzeller, 2005:136). In canonical correlation analysis, variables are divided into at least a two-variable cluster (*X and Y*) and eigenvalue and eigenvector are established from covariance matrix calculated from among clusters.

Canonical correlation analysis is based on investigation of linear compound pairs producing maximum correlation between canonical variable pairs derived from the linear compounds of a cluster having p independent variable comprised of n observations and another cluster having q dependent variable comprised of n observations (Borelens and Abbott, 1988: 1).

Nonlinear canonical correlation analysis does not hypothesise concerning the linearity of variables (Bayram and Ertas, 2001:1). In the analysis, variables found in clusters do not have any limitations except for not having deviated values (Sut, 2001:15).

Let the variable categories show a data cluster containing $k_j, j \in J = \{1, 2, \dots, J\}$ long with J categorical variable and N object. Categorical variables are shown by using G_j , indicator matrix (if i . unit belongs to t . category, then $G_j(i, t) = 1$), $i = 1, 2, \dots, N$,

$t = 1, 2, \dots, k_j$, or if i . unit belongs to other categories, then $G_j(i, t) = 0$). Here variables are classified, certain categories are addressed, and the lost function may be expressed as

$$\sigma(X, Y_1, \dots, Y_j) = J^{-1} \sum_{j=1}^J KT(X - G_j Y_j) = J^{-1} \sum_{j=1}^J (X - G_j Y_j)' (X - G_j Y_j)$$

In the equation above, $KT(\cdot)$ indicates the square summable of diagonal elements of a vector or a matrix. J indicates the variable count, G_j indicates indicator matrix of the j . variable ($j \in J(N * k_j)$), X indicates the object (unit) score value and $Y_j(k_j * xp, j \in J)$ shows the matrix containing multiple categorical quantisation of j . variable.

For nonlinear canonical correlation, generalised loss function for K variable group is shown as below.

$$\sigma(X, Y) = K^{-1} \sum_k KT(X - \sum_k G_j Y_j)$$

Perpendicularity condition must be met, and also Y_j and X variables must be normal. This hypothesis is shown by $U'X = 0$ and $X'X = 1$. X sum of weighted vectors are indicated as

$$X_{ks} = (z_{1k} w_{1ks} + z_{2k} w_{2ks} + \dots + z_{mk} w_{mks}) / m_k$$

A new T matrix must be defined for the minimisation of the loss function and for finding out Y_j values that provide hypotheses. This matrix has pxp dimensions, and it is sufficient for its elements to show certain characteristics based on the y matrix. If a Y_j matrix to be established provides hypotheses (limitations), then $Y_j T$ matrix would provide the same limits (Gifi, 1990).

Since $Z_k = \sum_{j \in J_k} G_j Y_j$ then, in the case of T matrix being defined, J shows the total variable count and K shows the number of clusters, and the loss function is thus as below (Sertbarut, 2010:31);

$$\sigma_j(X, Y, T) = K^{-1} \sum_K KT(X - Z_K T_K)$$

Canonical correlation analysis is a multi-variable analysis technique that provides information on the correlation between independent and dependent variables and the strength and direction of such correlation.

In resources on CCA, nonlinear canonical correlation analysis is named as OVERALLS short name for more than two sets of variables, and CANALS for two sets of variables (Giray, 2011:97)

3. Literature

Anxiety is defined as individual's sense of a possible danger happening to them, threatening of such basic motives as sufficiency, control, and self-esteem due to failing a duty,

melancholy and tension formed by stress-inducing situations, and such reactions in the individual causing pressure and tension as worry, apprehension, hurry, and unrest. Budak (2003) defines anxiety as depression or uneasiness, irrational fear caused by fear or expectation of danger or misfortune (Çevik, 2006). When employees feel anxiety, uncertainty, and lack of confidence in relation to work and future, they widely lose the capability of dominance over present time and of planning the future. Minimising anxiety levels of individuals would increase the quality of life. To that end, it bears utmost importance to determine the factors leading to anxiety (Cabi and Yalçınalp, 2013).

In literature, there are studies conducted especially on anxiety over teaching profession (Cabi and Yalçınalp, 2009; Doğan and Çoban, 2009; Saban et al., 2004; Smith, 2000). In addition, there are also studies investigating anxiety in youth and children. In his study, Spielberger (1960) investigated the correlation between the level of anxiety and academic success, and established that children with high level of anxiety had lower grades, and children with low anxiety had higher grades (Akınalp, 2013).

In a study by Onwuegbuzie (1999) found that there was a positive correlation between the procrastination behaviour of university students and anxiety levels (Erdul, 2005, p.32).

In his study conducted on high school students, Williams (1991) studied the effect of self-confidence and exam anxiety on academic success; and based on the results, students with high academic success had low exam anxiety and high self-confidence. Students with low academic success were noted to have high exam anxiety and low self-confidence (Akınalp, 2013).

In this questionnaires conducted on high school youth aged between 15 and 17, Özkan (1984), listed the issues that caused anxiety in more than 20 per cent of the youth based on the order of frequency. These were finding jobs, dying in pain, anxiety of choosing profession, and fear of failure (Akınalp, 2013).

Lerner (1977) who noted that the main concern of employees working in an organisation is justice established the below-mentioned principles of justice: a) Competitive justice principle (Distribution is conducted according the performance of employees) b) Equal sharing justice principle (Distributions are numerically equal), c) Sharing with equal foundations justice principle (Distribution is conducted based on the contributions of employees) d) Real justice principle (Distributions are for meeting the needs of employees) (İçerli, 2010: p.75)

Justice in an organisation is the rules and social norms regarding the management and distribution of rewards and punishments (Baş and Şentürk, 2011). Greenberg and Lind (2000) introduced four fundamental principles to provide a fair environment at the workplace. According to the principle of equality, products must be distributed in proportion to the contribution of employees to the organisation. Based on the principle of perception, justice is in the eyes of its parties and gains its sense according to the perception of people. According to the principle of sound, justice is provided by the participation of individuals to decision. Based on the principle of interpersonal justice, socially sensible behaviours may positively affect perceptions on unwanted outcomes (Akyüz, et al., 2013).

Although there are various ways of providing organisational justice, two of such methods furnish distributional and operational justices (Greenberg and Baron, 2000). Distributional justice is the degree of fairness that individuals perceive concerning organisation-wide distribution of such gains as income, premiums, promotions, and social rights (Karacaoğlu and Yörük, 2012). Operational justice is comprised of perceptions concerning the fairness of the allocation of resources and the processes used in organisational decisions (Karacaoğlu and Yörük, 2012).

4. Analysis

Job Anxiety Scale

Srivastava (1977) tried to establish in his study the factors comprising workplace anxiety by dealing with the environment in which anxiety occurs, namely the current job. These factors were explained as follows: A total of 7 factors as “*Security*” within the scope of job and personnel security; “*Recognition*” within the scope of fair evaluation, participation, praise, approval and freedom of manifesting their capability; “*Human Relations at work*” within the framework of interpersonal relationships, coordination and communication; “*Reward and punishment methods*” within the framework of the operations of the supervisor, blaming, unjust criticism and financial gains; “*Self-esteem*” within the framework of self- confidence, self-respect and social status at work; “*Future prospects*” within the framework of advancements and increasing the efficiency; and “*Capacity to work*” within the framework of abilities, responsibility and self-confidence. In the same study, Srivastava (1977) developed “*Job Anxiety Questionnaire*” made up of 80 questions with yes/no answers compiled from factors that he generated comprising of 10 questions measuring “*Security*” anxiety, 10 questions measuring “*Recognition*”, 15 questions measuring “*Human Relations at work*”, 15 questions measuring “*Reward and punishment methods*”, 10 questions measuring “*Self-esteem*”, 10 questions measuring “*Future prospects*”, and 10 questions measuring “*Capacity to work*” in order to render occupational anxiety of employees measurable (Srivastava, 1977). Our study analysed the correlation between reward-punishment perception of individuals working in an organisation and sociodemographic variables by using the above scale.

Analysis of the Correlation Between Reward-punishment and Sociodemographic Variables

Analysis values are given in Table 1. Loss in every dimension is the part where variability in object scores cannot be calculated with weighted combination of variables, that is, canonical variable score. Loss and adaptive values on the table may be adopted as an indicator of how data are adapted to the analysis.

Table 1 Analysis Values

		Dimension		Total
		1	2	
Loss Function	Set 1	.222	.255	.477
	Set 2	.222	.255	.477
	Mean	.222	.255	.477
Eigenvalue		.778	.745	
Adaptation				1.522

For the first dimension, eigenvalue of the first dimension is obtained by averaging the discrimination measures of all variable found in the analysis. This eigenvalue is a measure of adaptive value in the 1st dimension of the analysis For each dimension, eigenvalue is equal to the difference between the 1 value and mean loss value of the relevant dimension. Accordingly, eigenvalue for the first dimension becomes $1 - 0.222 = 0.778$ and the eigenvalue for the second dimension becomes $1 - 0.255 = 0.745$. Total adaptive value is obtained by the sum of eigenvalues. Therefore, total adaptive value is obtained as $0.778+0.745 = 1.523$.

Mean loss value is the difference between maximum and actual adaptation. Maximum adaptive value is equal to the number of dimensions and equals two here. Accordingly, mean loss value is $2 - 1.523 = 0.477$.

Here, there are two sets, and canonical correlation coefficient per dimension is found with the help of the below formula:

$$P_d = 2E_d - 1$$

Canonical correlation coefficient estimated in the first dimension becomes $2 \times 0.778 - 1 = 0.556$. Correlation coefficient in the second dimension is similarly obtained as $2 \times 0.745 - 1 = 0.49$.

Based on these results, a correlation of about 56% exists between reward-punishment and demographic variables sets. Accordingly, a medium-high level of correlation may be noted.

Weight and load values are estimated to establish which of the variables within the scope of the analysis are more significant. Weight values and component loads of variables are given in Table 2. Weight values are coefficients used for obtaining variables used in the analysis and also canonical variables. Component loads are correlation coefficients between digitised variable and object scores.

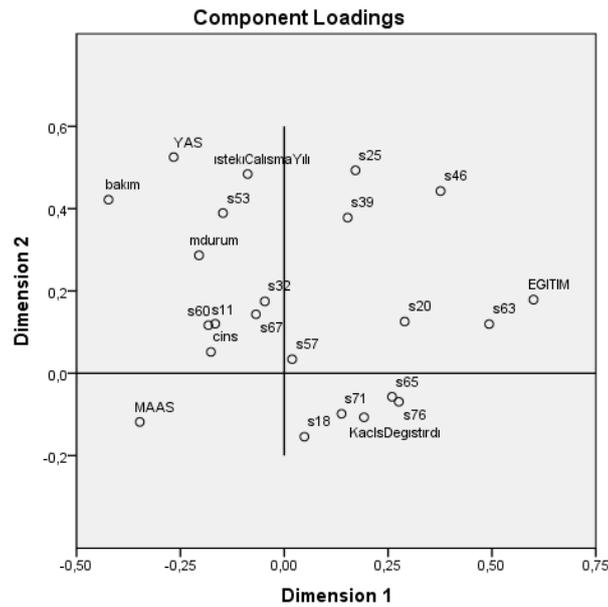
Table 2 Weight Values and Component Loads

Set		Weight Values		Component Loads	
		Dimension		Dimension	
		1	2	1	2
1	s11	-.215	.068	-.183	.117
	s18	-.025	-.024	.048	-.154
	s20	.310	-.059	.290	.126
	s25	-.097	.481	.171	.493
	s32	-.259	.229	-.047	.175
	s39	-.041	.359	.153	.378
	s46	.515	.305	.376	.443
	s53	-.162	.369	-.148	.389
	s57	-.059	-.070	.019	.034
	s60	-.538	-.066	-.166	.120
	s63	.451	.012	.493	.119
	s65	.126	-.184	.259	-.057
	s67	-.182	.134	-.068	.143
	s71	.085	-.217	.138	-.098
	s76	.276	-.307	.276	-.069
2	Age	-.032	.530	-.266	.525
	Education	.646	.276	.600	.179
	Number of Years at Work	.046	.505	-.088	.484
	Salary	-.454	-.454	-.348	-.118
	Number of Jobs so far	.318	-.206	.192	-.107
	Marital Status	.094	-.216	-.205	.287
	Gender	-.132	-.012	-.177	.052
	Care	-.383	.344	-.423	.422

Weight values of variables observed in Table 2 show the contribution of analysis to adaptive value. Accordingly, contribution of s60 (employees' not being able to talk about their rights in the concerned workplace) variable in the 1st set to the adaptive value of the 1st dimension and contribution of s25 (frequent concerns over possible punishments) variable to the adaptive value of the 2nd dimension are the highest.

Component loadings are graphically given Figure 1.

Figure 1 Graphic Representation of Component Loadings



It may be observed from Figure 1 that the most significant variables are age and education. Single and multiple adaptive values are given in Table 4, and since these values resulted in being quite close, multiple digitisation was deemed unnecessary.

Table 3 Single and Multiple Adaptive Values

Set		Multiple Adaptive			Single Adaptive		
		Dimension		Total	Dimension		Total
		1	2		1	2	
1	s11 ^a	.046	.005	.051	.046	.005	.051
	s18 ^a	.001	.001	.001	.001	.001	.001
	s20 ^a	.096	.004	.100	.096	.004	.100
	s25 ^a	.009	.232	.241	.009	.232	.241
	s32 ^a	.067	.052	.119	.067	.052	.119
	s39 ^a	.002	.129	.130	.002	.129	.130
	s46 ^a	.265	.093	.358	.265	.093	.358
	s53 ^a	.026	.137	.163	.026	.137	.163
	s57 ^a	.004	.005	.008	.004	.005	.008
	s60 ^a	.290	.004	.294	.290	.004	.294
	s63 ^a	.203	.000	.203	.203	.000	.203
	s65 ^a	.016	.034	.050	.016	.034	.050
	s67 ^a	.033	.018	.051	.033	.018	.051
	s71 ^a	.007	.047	.054	.007	.047	.054
s76 ^a	.076	.094	.171	.076	.094	.171	
2	Age ^b	.025	.332	.356	.001	.280	.281
	Education ^b	.419	.081	.500	.417	.076	.494
	Number of Years at Work ^b	.002	.255	.257	.002	.255	.257
	Salary ^b	.207	.206	.413	.206	.206	.412
	Number of Jobs So Far ^b	.102	.044	.146	.101	.042	.143
	Marital Status ^b	.009	.047	.056	.009	.047	.056
	Gender ^b	.017	.000	.018	.017	.000	.018
Care ^b	.152	.123	.275	.147	.118	.265	

When Table 4 is examined, variables with the highest adaptive value are observed as s60 (employees' not being able to talk about their rights in the concerned workplace), s46 (occasional thoughts about ungrounded charges), s25 (frequent concerns over possible punishments), and s63 (fear from the superiors or employers, even without any reason). These variables bear more importance in the analysis compared to other variables.

Centroids Graph is given in Figure 2.

Grouping of individuals in terms of reward-punishment perceptions based on socio demographic characteristics were analysed. Accordingly, reward-punishment perception of individuals above the age of 35 and are graduates of elementary school whose superiors get aggravated from the work done without any reasons were established as high. This is an indicator that individuals with such characteristics working in such a workplace also had higher concerns over being made redundant. The outcome that unemployment concerns of individuals that have been working for a short time and were especially below the age of 25 were low also coincides with the literature.

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