

MOTIVATIONAL TOOLS AND EMPLOYEE PRODUCTIVITY IN ORGANISATIONS

Kayode O. Bankole, Felix McDubus & Company (Chartered Accountants), Lagos-Nigeria
Kingsley N. Ashibogwu, Department of Accounting, Novena University, Ogume, Nigeria
Prof. Onyuka F. McDubus, Department of Accounting, Novena University, Ogume-Nigeria

Abstract: This research has as its objective, the identifying the motivational devices and the determination of effects of motivational tools on employee productivity in organisations. The Nigerian National Petroleum Corporation was chosen as the case study. The motivational devices employed at the Corporation were identified. Leadership styles were discussed and questionnaire was constructed and administered to thirty respondents and their opinions were documented. Reliability test was conducted for the responses using Cronbach's Alpha and Kendall's Coefficient of Concordance and a value of 0.982 and 0.79 were obtained respectively. These responses were reliable according to the two tests conducted. The study found that the implementation of good corporate policies motivated the work force tremendously. Other motivators identified include salary, job security, promotional opportunities, job rotation and job enrichment.

Keywords: Motivational Devices, Employee Productivity, Leadership Styles, Corporate Policies, Reward

1. INTRODUCTION

This research is intended to highlight the roles which motivational devices play in raising the morale of employees to bring out the best in them. The research examined extensively how effectively workers can carry out their jobs with these devices.

Management is responsible for organising the elements of production such as equipment, materials and people for the attainment of economic ends. The performance of an employee depends on his knowledge and skills. Employee motivation is one of the policies of managers to increase effectual job satisfaction amongst employees in organization. A motivated employee is responsive to the definite goals and objectives he/she must achieve (Maduka&Okafor, 2014).

What motivates the worker so that his abilities and skills can be activated and his potential realized? An employee works best when he feels that his work is important. The little he



puts in is part of the total input and without it, the process is incomplete. Since the employee gets satisfaction from his job; his efforts should lead to the attainment of this satisfaction. Coercion does not produce results in workers; rather efforts should be made to make them feel that they "belong".

Management directs workers, motivates them, controls their actions and also structures their behaviour to meet the needs of the organisation. Without active interference by management, workers exhibit nonchalant attitudes to organisational needs. Therefore, employees must be motivated, rewarded, controlled, queried and their activities must be channeled towards achieving the corporate objectives. Management's task is getting work done through and with other people (Drucker, 1974).

McGregor's Theory X indicates that:

- Naturally, human beings have a dislike for work, work as little as possible or avoid work generally.
- He does not take responsibility, is not ambitious and is comfortable when he is being led.
- He is to be motivated, controlled, directed and punished to get him put in his best towards the achievement of the organisational objectives.
- He is by nature resistant to changes.

Due to the economic situation in the country, workers are insecure on their jobs as a result of retrenchment, lay-offs, pay-cuts and compulsory leave. In order to encourage active participation from employees to achieve results, motivational devices have to be introduced within an organisation. To most people, an incentive implies monetary reward. Money is not necessarily the most important factor leading to increased output and job satisfaction in the organisation. Incentives and rewards may be financial and non-financial. They are used for the purposes of persuading people to come to work, encouraging people to work harder when they are at work, helping people to identify themselves with the objectives of the organisation and showing management's appreciation of the employees' contribution to the survival of the organisation (McGregor, 1956). All organization encounters the matter of motivation whether they are in the public or private sector (Chintallo&Mahadeo, 2013).



2. OBJECTIVES OF THE STUDY

The main objective of this study is to ascertain the effectiveness of motivational devices in achieving greater productivity. The specific objectives are:

- 1) To examine the various forms of devices which management adopts.
- 2) To evaluate the effectiveness of selected motivational devices in attaining organisational productivity.

Aluko (2000) noted that the major motivational factor is money, although we have seen that in Nigeria, money alone does not guarantee productivity

3. RESEARCH QUESTION

In quest to fulfill the objectives of the study, the following research questions were raised:

- 1) What are the various forms of motivational devices adopted by management?
- 2) Are the selected motivational devices effective on productivity?

The Concept of Motivation

According to Aiyetan and Olotuah (2006) motivation is an art targeted to getting people work willingly, and an art of inducing one to behave in a particular manner to achieve a task. It is generally believed that when a person is motivated, he is in a state of tension and this generates an energy or drive in that person which urges him to reach his set goal. He feels impelled to take some action, and when this goal is achieved, the need is then satisfied and the tension diffused.

Motivation can also be said to be an immediate force that acts to energise, direct, sustain and stop a behaviour. It operates in a circular form. It starts with a need state, that is, a state of imbalance or a state of deprivation. The need is followed by the drive state which is the desire to act and settle the 'need' or 'want'. But the real action is not taken until the 'Expected Reward' is evaluated. If the outcome of the evaluation is positive, then the individual proceeds to take action to moves towards the goal object. After the action comes the result which is the reward obtained. If the reward is satisfactory, then the goal has been achieved and then the action stops, but if not, the cycle continues.

Motivation as a Drive

Factors that affect motivation are individual, organisational and job factors. The individual factor is sub-divided into hereditary and environmental factors. Hereditary factors include inherited abilities like intellectual ability, memory and physical characteristics. What we



inherit from our parents one way or the other affects our motivation. Such traits may either enhance or kill our motivation towards a goal. The environmental factor is sub-divided into prenatal and postnatal environment. The prenatal environment is the period of pregnancy and it has to do with the development of the child at that stage. The health of the mother is caused by nutritional factors. Postnatal environment includes the mother, family, friends, culture and religion. All these environmental factors do affect human motivation. Our family can greatly influence our motivation, so also is our culture. The peer group also affects one's behaviour because our friends influence our actions a great deal. Organisational factors are the organisation's management policies that affect motivation. The organisation's climate, whether conducive or not influence motive. Leadership style or organisational chain of command, whether autocratic or democratic exerts similar influence. The channel of should be seen as another potent variable (Plomin and Asbury, 2005).

The job factor includes conditions of service, work environment, equipment in use in an organisation and remuneration. These factors go a long way to affect human motivation in a work situation. Maslow (1943) proposed that all motives or needs can be arranged in such hierarchy from lower to higher order needs. The task of management is getting work done through and with subordinates, but for effective cooperation between the subordinates and management, motivational devices in form of fringe benefits must be given to the workers to help boost their morale and for the attainment of their own objectives within the company (Drucker, 1974).

An employer can motivate an employee by making him aware of his needs through the use of an incentive. An incentive scheme may be interpreted in many ways and people may have varied opinions as to its objectives. Normally, there are good schemes and bad ones and an individual's opinion of them depends on his personal knowledge and experience.

Motivational Devices Applied in the Corporation

NNPC believes that the greatest part of a manager's job is to get work done through others. Strong emphasis should therefore be placed on understanding people's motivation, which believed to be concerned with inducing people to work to the best of their ability.

Certain aspects of motivation of employees cannot be provided by management as other external factors influence the working environment, for example community or family



pressures. To understand human motivation requires that we must attempt to understand our own personality and the effect it has on others. We should have a desire to understand the real needs and wants of those we are responsible to and be committed to manage, lead and motivate them in a manner appropriate to those needs and wants.

Motivational devices have often been seen traditionally as a question of relating pay to quantity or quality of work, but experience has shown that money is by no means the only motivator. As a result, NNPC applies various types of motivational tools, which are either financial or nonfinancial or both. These include end-of-year bonus, housing allowance, long service award, merit award, free canteen services, provision of sporting/recreational facilities, staff club, training facilities, staff school/scholarship scheme, promotion policy and free medical facilities.

Motivation is the internal or external driving force that produces the willingness to perform an act to a conclusive end (Maduka and Okafor, 2014).

Motivation and Leadership

Motivation and leadership are two inter-related functions which management should employ in order to achieve the corporate objectives of the organisation. Motivation, as has been stated earlier, is the act of carrying along the total workforce by means of applying incentives and other methods which can spur the employee on to better performance. It is also an inner drive which prompts people to behave in one desired way or the other.

Leadership, on the other hand, is an act of guiding, controlling and directing workers in order to achieve results. A good leader must be a master planner, be able to plan and organise his job, be able to delegate responsibility with authority and be capable of laying good example for others to follow. A leader has to be more knowledgeable about the practical and technical aspects of his job than most of his subordinates and also, it is important that he has to have a pleasant personality. He should be considerate, exercise restraint in his utterances and actions and create a favourable atmosphere where subordinates will be motivated to increase their efficiency and productivity.

One of the most important factors in the success or failure of an organisation is its leadership. All managers are organisational leaders, and leaders have their subordinates as followers. The leader who depends solely on organisational powers, that is, the formal powers of position in an organisation, exhibit little or no leadership traits.



Styles of Leadership

The means by which a leader motivates his subordinates is referred to as the style of his leadership. There are three main types of leaders: the authoritarian, the participative and laisser-faire. While the authoritarian leader is more concerned about the success of a task, the participative leader is more concerned about the needs of his subordinates more to the detriment of the organisational objectives.

Authoritarian leaders rely more on their formal powers and keep a close supervision on their subordinates. A participative leader, on the other hand, involves his subordinates in decision making and general supervision is associated with such leadership. He, more or less, allows subordinates to usurp his powers. Laisser-faire is predominant where the leader is weak and does not have authority over his subordinates (https://www.verywellmind.com/leadership-styles-2795312)

Dissatisfaction at Work

Most often, increases in pay have erroneously been used to create satisfaction at work. This has failed everywhere, including Nigeria, where we have continuously had wage increases and at the same time a drop in job satisfaction and job performance rate. If people will be a panacea for organizational success, the organisation will either ensure satisfaction of its people at work or remove job dissatisfaction variables.

The first approach here is to discover why people come to work and give them all necessary help in achieving them. This will reduce dissatisfaction at work.

A lot of reasons have been given by people for going to work. People go to work to earn a living, to have identity, to relate with cooperating peers and superiors, to be recognized and have image, to please their family members and friends, to meet some needs; (psychological, security, egoistic or otherwise), for social reasons. The work place is fast becoming a family and consequently man's total expectations for living is focused on his organisation. An opportunity for him to meet these expectations will reduce dissatisfaction at work.

Besides, all of man's behaviour is motivated behaviour. It is true that man has a normal behavior, but for him to meet the challenges of present day expected performance level, he has to be motivated. A lot of theoretical work has been done in this area, such as Abraham



Maslow's Hierarchy of Needs, Fredrick Hertzberg's Two-factor Theory, McClelland's Needfor-Achievement Theory, Victor Vrooms Expectancy Theory.

Motivation and Productivity

Motivation (a driving force which stimulates people into action) is fast demanding individual approach. In our country today, young people graduate at earlier ages hold managerial positions almost at once. They cannot be motivated with our old theories and tools. People, being psychological in nature, possess some drives, which can mean the only way to make them act. Some people are competence driven, that is, thoroughness is their goal. Whatever has to be done must be properly and efficiently done (Noels, Luc, Richard & Robert 2003).

Some are power driven: they want adequate authority to perform a task properly; they cover leadership positions, which have enough power to back them up. Yet some others are affiliation driven, having much importance placed on good relationships as a drive to efficient job performance. To reduce job dissatisfaction, the organization must discover what exactly makes an individual staff tick (the driving force that modifies his behaviour at work). This will surely lead to job satisfaction, which has a contributory effect on performance and organizational success.

Again, dissatisfaction can be reduced by increasing the psychological meaningfulness of work: increasing people's quality of work life by allowing people to have a say in the organization, influence their work environment, see their path to success in the organization and even have a share of the profit outside whatever remuneration paid to them as salary or wages, incentives or fringe benefits. Attractive salaries or pay is also a valuable tool and play an important role to increase employee's performance and the productivity of an organization (Muogbo, 2013).

3. MATERIALS AND METHOD

The most used instrument in research, the questionnaire, was employed in the study. It comprised carefully designed questions for the respondents to answer. A combination of the open-ended and the structured or closed form of questions were asked. In the open-ended form, the respondents were allowed to express and clarify issues.

The information sought for with the open-ended questions was coded before being reported quantitatively. In the structured or closed questions, the respondents only ticked the appropriate items that best suit their opinions.



The researcher made out two sets of questionnaire, one set for the employee and the other set was for the management team. Face-to-face interviews were conducted on the respondents that are illiterate, because it was important to the research that a cross-section of those people be tested. It afforded the researcher the opportunity to collect more information that was not possible with the questionnaire.

Population and Sample

The population of the study is 100 employees of the Corporation of which 30 employees were sampled using judgmental sampling technique. Table 1 shows the population and sample for the study:

Descriptive statistics in Table 3 shows the mean, median, minimum, maximum and standard deviation of the responses and provide a general overview of the characteristics of the data. Furthermore, the relatively low standard deviations for most of the responses indicate that the deviations of the opinion of the respondents are relatively very small.

A reliability test was conducted for the study as shown in table 5. The reliability test of the variables using Cronbach's Alpha shows that the combinations of the responses of the respondents for this study is reliable given the 0.982 value of the Cronbach's Alpha. This shows that the extent the respondents agreed on the questions is reliable at 0.982 level of the Cronbach's Alpha test.

Table 7 shows that the grand mean is within the range of the individual mean of the variables. Which shows that the means are consistent and reliable in the study. The analysis of ANOVA tests is also significant at 0.000. The F value explains the overall significance of the variables. It explains the significance of the relationship between the variables. The value of F-Statistics is also significant at 10.030.

Table 8 shows Kendall's coefficient of concordance is significant at the value of W = 0.79. This is an indication of the degree of agreement between respondents to the questions in the questionnaire. The value shows that the level of agreement between the respondents is reasonable at the 0.79.

Results

In answering the first question raised by this study, interview was conducted to the junior employees of the corporations to get answer to the question. The following were the motivational devices identified by the staff of the organisation.



- 1. Training
- 2. Compensation
- 3. Security of Tenure
- 4. Safety at work
- 5. Conditions of Service

The analysis of the questionnaire responses will therefore be focused on these devices identified by the employees of the corporation.

Training: The result of the descriptive study shows that management recognises the impact of training on productivity and is doing well in training the employee. This shows that employees tend to perform well if they have the required training. Training is very important to boost productivity and employees' morale in their jobs. The result here shows that management of the Corporation has been doing its best, though employees still believe they can do more in this area.

Compensation: Most of the employees believe that compensation boosts employee morale. The result shows that employees tend to perform well if there is reward for their efforts.

Security of Tenure: Job security is a very important device used to motivate employees. Every employee will work well if they are sure that their work is secured. But if there is no job security, employees in the quest to get a secure job may not put in their best in carrying out their duty.

Safety at Work: Safety is very important in the workplace. The result of the descriptive study shows that the Corporation has been doing well in creating a safe work environment for the employees. This gives employees, the confidence to work well and encourage them to put their efforts in the work they do since they know that the organisation has their interest at heart.

Conditions of Service: Conditions of service, such as retirement benefits (pension and gratuity) and health insurance are very potent motivational tools that encourage employees to do well in the workplace. From the study, it is observed that employees will do well if the organisation has Conditions of Service. Workers also tend to stay longer in the organisation that has Conditions of Service than in organisation without. It is also observed that workers perform excellently well in an organisation with necessary Conditions of Service.



Conclusion and Recommendation

The role which motivational devices play in the running of an organisation cannot be overemphasised. The implementation of good corporate policies is a motivational factor to a workforce. In other words, an organisation that is devoid of favouritism, nepotism, and other vices will have a lot to show for it in terms of productivity, because workers will be happy on their jobs and will therefore, do their jobs well.

In order to aid effective administration of motivational devices, management of organisations have to take cognizance of the following suggestions:

First, low salary makes the employee less productive. Better remuneration is a necessary condition for generating appropriate commitment and productivity of employees. Therefore, salary should be regularly reviewed in line with the inflationary trend.

Fear of insecurity and redundancy often affect increased productivity and render the motivating power of high salary and other benefits unattainable.

There is need for management to embark on enlightenment programmes to re-orientate employees on their promotion opportunities.

In the same vein the Corporation should encourage job rotation and job enrichment in areas where promotion opportunities are limited. This should be done with a view to minimizing boredom, monotony and dissatisfaction on the job.

REFERENCES

- 1. Adair J. (1982), *Training and Leadership*, McDonald and Evans Ltd, London.
- Aiyetan, A. O. and A. O. Olotuah, (2006), Impact of motivation on Workers' Productivity in the Nigerian Construction Industry, In Boyd, D (Ed) Procs 22nd Annual ARCOM Conference, Birmingham, UK, Association of Researchers in Construction Management.
- Aluko, M.A (2000); Employee Motivation: An Effective Tool for enhancing Worker's productivity. *Business and Management Journal*. Michael Stevens & Associates. July– September. Vol. No. 3 pp. 32.
- 4. Bottomley, M. J. (1983), *Personnel Management*, McDonald and Evans Ltd.
- Chintalloo, S and Mahadeo, J. (2013). Effect of Motivation on Employees' Work Performance at Ireland Blyth Limited: Proceedings of 8th Annual London Business Research Conference Imperial College, London, UK, 8 ISBN: 978-1-922069-28-3.



- Drucker, P. F. (1974), Management Tasks, Responsibilities and Practices. William HeinemannLtd., London.
- 7. Gullerman, S. W. (1986), *Management by Motivation*, American Management Associate Inc., USA.
- 8. https://www.verywellmind.com/leadership-styles-2795312) accessed July 6th, 2018.
- 9. Koontz, O. and Urwick L. (1937), *Science and Administration Today,* Earnest Dale, New York.
- 10. Macgregor D. (1956), *The Human Side of Enterprise*, Harper and Brother, New York.
- Maduka, C. E. and D. O. Okafor, (2014), Effect of Motivation on Employee Productivity: A Study of Manufacturing Companies in Nnewi, *International Journal of Managerial Studies and Research (IJMSR) Volume 2, Issue 7,* PP 137-147.
- 12. Maslow, A. H. (1943), A Theory of Human Motivation, *Psychological Review*, Vol. 50.
- Muogbo, U. S. (2013), The Impact of Employee Motivation on Organisational Performance (A Study of Some Selected Firms in Anambra State Nigeria: *The International Journal Of Engineering And Science (IJES), Volume 2,* Issue 7, pp. 70-80.
- Noels, K. A., P. Luc G., C. Richard & V. Robert J. (2003), "Why Are You Learning a Second Language? Motivational Orientations and Self-Determination Theory." Attitudes, Orientations, and Motivations in Language Learning. Ed. Zoltán, Dörnyei. University of Michigan.
- Plomin, B. and Asbury K., (2005), Nature and Nurture: Genetic and Environmental Influence on Behaviour, *The Annals of the American Academy of Political and Social Science.* Available at https://www.jstor.org/stable25046112. Accessed on July 9th, 2018.

Department	Population	Sample
Production	25	8
Engineering	25	8
Purchase/Sales	10	2
Personnel/Admin	20	6
Finance/Account	20	6
	100	30

Table 1: Sample made from the population



Table 2: Respon	se Frequencies
-----------------	----------------

S/N	Motivation and Productivity	Total no. of	Agree	%	Disagree	%
1	Freedowers were to be able to think of	Respondents	10	22	20	C7
1	Employees want to be able to think of themselves as the "best" on their jobs.	30	10	33	20	67
2	Implementation of good corporate	30	12	40	18	60
	policies is a source of satisfaction to					
	employees.					
3	Pride in an employee's work is actually a	30	10	33	20	67
	motivational device					
4	Almost every job could be made more	30	10		20	67
	stimulating and challenging					
5	Company retirement benefits are	30	16	53	14	47
	important factors in keeping employees					
	on their jobs					
6	Organisation achieves its corporate	30	20	67	10	33
	objectives only with the performance of					
	its employees					
7	Management takes cognizance of life	30	10	33	20	67
	outside the office environment					
8	Companies devote adequate funds yearly	30	10	33	20	67
	to motivational schemes					
9	Management takes cognizance of	30	10	33	20	67
	employee's background before applying					
	motivational devices					
10	Monetary awards are applied to	30	16	53	14	47
	employees who perform well					
11	Management recognises workers union	30	18	60	12	40
	because of employees' trust in union's					
	ability to fight for their interests					
12	Management takes safety of employees		12	40	18	60
	into consideration by providing safety					
	kits in case of accidents					
13	Management strives towards providing	30	22	73	8	27
	security of tenure for employees					
14	Motivation devices serves to boost the	30	22	73	8	27
	morale of employees towards					
	productivity					
15	Employees who are productive on their	30	16	53	14	47
	jobs are those that are duly motivated by					
	good management policies		10			6-
16	Labour turnover could result from	30	10	33	20	67
	inadequate motivational devices					
17	The style of leadership operated is	30	12	40	18	60
	important to a conducive working					



	environment					
18	Management tries at all times to better	30	15	50	15	50
	the lots of its employees by continuously					
	training them in individual fields of work					
19	Employees who perform excellently are	30	12	40	18	60
	compensated adequately so that others					
	strive to do better					
20	Some employees are not motivated by	30	20	67	10	33
	some devices that management applies					

Table 3: Descriptive Statistics

S/N	Motivation and Productivity					Std.
		Ν	Minimum	Maximum	Mean	Deviation
	Employees want to be able to think of themselves as the "best" on their jobs.	30	1.00	2.00	1.6667	.47946
	Implementation of good corporate policies is a source of satisfaction to employees.	30	1.00	2.00	1.6000	.49827
	Pride in an employee's work is actually a motivational device	30	1.00	2.00	1.6667	.47946
	Almost every job could be made more stimulating and challenging	30	1.00	2.00	1.6667	.47946
	Company retirement benefits are important factors in keeping employees on their jobs	30	1.00	2.00	1.4667	.50742
	Organisation achieves its corporate objectives only with the performance of its employees	30	1.00	2.00	1.3333	.47946
	Management takes cognizance of life outside the office environment	30	1.00	2.00	1.6667	.47946
	Companies devote adequate funds yearly to motivational schemes	30	1.00	2.00	1.6667	.47946
	Management takes cognizance of employee's background before applying motivational devices	30	1.00	2.00	1.6667	.47946
	Monetary awards are applied to employees who perform well	30	1.00	2.00	1.4667	.50742
	Management recognises workers union because of employees' trust in union's ability to fight for their interests	30	1.00	2.00	1.4000	.49827
	Management takes safety of employees into consideration by providing safety kits in case of accidents		1.00	2.00	1.6000	.49827
	Management strives towards providing security of tenure for employees	30	1.00	2.00	1.2667	.44978



14	Motivation devices serves to boost the					
	morale of employees towards productivity	30	1.00	2.00	1.2667	.44978
	Employees who are productive on their jobs					
	are those that are duly motivated by good	30	1.00	2.00	1.4667	.50742
	management policies					
16	Labour turnover could result from	20	1 00	2 00	1 6667	47040
	inadequate motivational devices	30	1.00	2.00	1.6667	.47946
17	The style of leadership operated is important		4.00	• • •		1000-
	to a conducive working environment	30	1.00	2.00	1.6000	.49827
18	Management tries at all times to better the					
	lots of its employees by continuously	30	1.00	2.00	1.5000	.50855
	training them in individual fields of work					
19	Employees who perform excellently are					
	compensated adequately so that others	30	1.00	2.00	1.6000	.49827
	strive to do better					
20	Some employees are not motivated by some	~ ~	4.00	• • • •		170.40
	devices that management applies	30	1.00	2.00	1.3333	.47946
	Valid N (listwise)	20				
		30				

Reliability Tests

Table 4: Case Processing Summary

		Ν	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Table 5: Reliability Statistics

Cronbach's	Cronbach's Alpha Based on	
Alpha	Standardized Items	N of Items
.982	.982	20

Table 6: Summary Item Statistics

					Maximum /		
	Mean	Minimum	Maximum	Range	Minimum	Variance	N of Items
Item Means	1.528	1.267	1.667	.400	1.316	.021	20



Table 7: ANOVA

	ANOVA									
				Mean						
		Sum of Squares	Df	Square	F	Sig				
Between People		103.268	29	3.561						
Within People	Between Items	11.885	19	.626	10.030	.000				
	Residual	34.365	551	.062						
	Total	46.250	570	.081						
Total		149.518	599	.250						

Grand Mean = 1.5283

Table 8: ANOVA with Tukey's Test for Nonadditivity

		Sum of				-
		Squares	Df	Mean Square	F	Sig
Between People		103.268	29	3.561		
Within People Between	tems	11.885 ^ª	Df Mean Squar 268 29 3.56 85 ^a 19 .62 71 ^b 1 .67 694 550 .06 365 551 .06 250 570 .08		146.475	.000
Residual	Nonadditivity	.671 ^b	1	.671	10.945	.001
	Balance	33.694	550	.061		
	Total	34.365	551	.062		
Total		46.250	570	.081		
Total		149.518	599	.250		

Grand Mean = 1.5283

a. Kendall's coefficient of concordance W = .079.

b. Tukey's estimate of power to which observations must be raised to achieve additivity = .125.