

A Statistical Analysis for Increasing Reward with Increasing Size of Jama'at: A Revisit

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Abstract

The concept of congregation (Jama'at) is one of the fundamental concepts of the social construction of Islam. The divine reward of a Sala'at (prayers), as enunciated by Holy Prophet (P.B.U.H.), is multiplied by saying it in Jama'at. There are numerous sayings of Holy Prophet (P.B.U.H.) which show that this divine reward of a Jama'at is a statistical function of that of a Sala'at said individually. The current paper is the second in an attempt to find that function. It is being established here that this function is cubic, with a very sharp slope, in nature and then may be deduced to forecast the divine reward one may have by saying a Sala'at in Jama'at, at one hand, and to appraise the increase in the divine reward with the size of the Jama'at. The same function also connects different, apparently conflicting, sayings of the Holy Prophet (P.B.U.H.) regarding the comparisons of this divine reward.

Keywords

Least square, Reward for Sala'at

1. Introduction

The concept of Jama'at, congregation, is one of the basic and the most cited concept in Islam. It has been emphasized to say prayers preferably in Jama'at. Holy Quran ordains "...bow down your heads with those who bow down..." (Quran, 2:43). To follow this, the essential part of every obligatory prayer, Sala'at, called fardh, are said in Jama'at. The whole Muslim body, both men and women, that can assemble in one place, must gather at the appointed time, praise and glorify God, and address their petitions to Him as a single body.

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All people stand shoulder to shoulder, in a row, or in several rows, as the case may be, their feet being in one line, and one person, chosen from among them, and called Imam, leads the Sala'at and stands in front of all. Such a formation, which is ceremonial in appearance and humble in nature, develops a unique social cohesiveness among the member of this formation. And perhaps, this social cohesiveness is the most important earthly reward of this Jama'at which promotes connectedness in the community. However, the earthly reward is only one side of the story and the formation does carry divine rewards which according to many sayings of the Holy Prophet of Islam (P.B.U.H.) has a direct link to the size of this formation. The current paper is an attempt to investigate this link, if it exists at all. As a matter of fact, this is second in the episodes to investigate such relationship.

The Sala'at is one of the most important duties of a Muslim, after one has brought faith in one God and in Prophet Mohammad (P.B.U.H.). It is the most special act of Divine worship, which a Muslim is called upon to practice five times a day. There are numerous verses of the Quran and the Traditions of the Prophet (P.B.U.H.) enjoining the Sala'at on us. It has been described as the pillar and the foundation of the faith. Sala'at, if offered with a sincere heart, proper devotion and mental concentration, is particularly devolved into cleansing heart and reforming one's life and ridding it of sins and impurities. It generates love for piety and truth and promotes fear of Allah in man. It is further ordained that the bounties of Sala'at, both in terms of earthly and divine reward, are multiplied when performed in congregation, or Jama'at. The Quran has clear verdicts on the Jama'at. The Prophet (P.B.U.H.) was also very particular about it that, once while condemning the conduct of Muslim those who avoided coming to the mosque to say their prayers in Jama'at due to laziness or indifference, he observed with anger that he felt like burning down their homes.

Like other prayers, saying Sala'at in Jama'at does carry bounties, both in terms of earthly and divine rewards. There are several traditions in which Prophet of Islam, Mohammad (P.B.U.H.), has dilated upon the value and divine rewards of Sala'at and especially Sala'at said in Jama'at from different dimensions. For the sake of current study, I have selected only a few of these Holy sayings of the Prophet (P.B.U.H.) comparing the reward of a Sala'at said individually and in Jama'at;

- Saying Sala'at in Jama'at is better than saying individually. Jama'at of three is better than that of two and the liking of Allah increases with the size of Jama'at (Abu Dawud 2554).

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- Two persons performing Sala'at together, with one as imam, are liked by Allah more than four persons saying Sala'at individually; similarly, four persons performing Sala'at with Jama'at are liked by Allah more than eight persons saying it individually and (again) eight persons performing Sala'at with Jama'at are liked by Allah more than one hundred persons saying it individually (Al-BazzarandTabarani, 1352).
 - Saying Sala'at in Jama'at is 25 times more reward giving as compared to a Sala'at said individually in home and/or market place (Bukhari, 8466).
 - Sala'at in Jama'at is 27 times more reward giving as compared to that in individual (Muslim,1477).

As a matter of interest, all these Holy sayings, bullets 1 to 4 above, show numerical comparisons between the divine rewards for Sala'at said individually and in Jama'at. The Holy saying in bullet 1 shows the liking of Allah, the divine reward, for a Jama'at as increased by increasing the size of Jama'at from two persons to three. However, it does not quantify the increase in this reward. The saying in bullet 2 discusses the value of this divine reward, as a proxy of Allah's liking. It does quantify and shows the details of the arithmetic for the value of divine reward as increased with the size of the Jama'at. The sayings in bullet 3 and 4 are again a comparison of this divine reward but without the details and, further, seems to be in conflict with what is being said in bullet 2 and even in bullet 1. The conflict as it appears, or the difference in the numerals is quite perplexing especially for staunch believers who cannot even think of any difference in the Holy sayings. The current series of the papers is written with the very objectives that

- To investigate the relationship between the size of the Jama'at and the divine reward, if there exists any, in the light of available Holy sayings both in Quran and Hadiths.
- To develop functional form of this relationship which may help in edifying the importance of Jama'at.

The Muslims religious literature is silent in this regard. Much is available to verify, glorify, and to accentuate the importance of Jama'at but nothing to investigate this relationship. No academic research is available either. Qurashi (1983) opines, however, that it is related, or specific, to higher sizes of the Jama'at while discussing these sayings in the study of motivation. Siddiqi (2013),

in the first episode of the current paper, did attempt to develop a functional form of this relationship.

Let's explore the arithmetic given in Holy saying in bullet 2. The arithmetic is given in Table 1. The ratios in the last row are not the part of the Holy saying and are deduced by dividing the total rewards by the number of participants of the Jama'at. A graphical depiction of these statistics is given in Figure 1, where left panel shows the dynamics of the total divine reward of the Sala'at as the number of participants grow, while the right panel gives the dynamics of the divine reward for each participant of the Sala'at said in Jama'at.

The value of the divine reward, in both cases, increases very sharply as the size of the Jama'at grow. One may be curious to find the value of divine reward for other numbers of participants. The current article, as has been explained earlier, is an attempt in the same direction. It should be noted here that the attempt is merely a mathematical deduction of the Holy saying and not in any way an inductive interpretation. It is simply an effort to extrapolate the value and amount of divine reward for other higher sizes of the Jama'at.

So, the divine reward of the Sala'at in Jama'at is a function of the divine reward for a person who is saying prayers individually. Mathematically, this function may be written as;

$$\text{Reward of Jama'at} = f(\text{Number of Persons in the Jama'at})$$
$$r = f(p)$$

with r indicating the divine reward for the Jama'at and p is indicating the divine reward for a person who is saying his prayer individually. For example, $p=2$ means the combined divine reward for two persons.

The form and the shape of this function f is interesting enough to forecast the value of the divine reward for the whole Jama'at and for the individual participant of the Jama'at. The following section suggests different approaches to mimic, in the first hand, the curve in the form of a mathematical function which may further be used to extrapolate, or forecast, the value of reward for any number of participants of the Jama'at.

2. Exploring the mathematical function

The saying of Holy Prophet (P.B.U.H.), in bullet 2, may be deduced into a value of total divine reward for the Jama'at when the size of the Jama'at increases continuously. Similarly, the value of the divine reward for each individual person in the Jama'at may also be deduced.

Let's use the principle of least squares (see Plackett (1972) for details) to fit an appropriate curve to the data which may be used to extrapolate or forecast the value of divine reward for any number of persons. Figure 1 suggests it either to be a parabolic, power or an exponential curve (and absolutely not linear) which may well represent the data. Figure 2 gives a few choices for the possible curves for the data including power, parabolic and exponential curve, etc.

The considered choices, in Figure 2, include a whole list of curves for fitting, the details of which are also available in the legend, with some seeming to fit the observed data while others deviate markedly. Qurashi (1983) uses a power curve to derive formula for motivation, cooperation and achievement of a team. Siddiqi (2013) preferred a quadratic curve to define the relationship. Using R^2 , the coefficient of determination, to select the best possible approximation of the observed data, Table 2 shows a comparison.

Evidently, both power and quadratic curves, as suggested by the literature, are not representing the data fully. While the cubic fit (- -) seems to represent the data, represented by circles, in a much better way. So, the cubic fit for the data, in Table 2, is given by

$$r = -7.048 + 11.667p - 4.167p^2 + 0.548p^3 \quad (2.1)$$

With r indicating the divine reward for the Jama'at and p indicating the divine reward for a person who is saying his prayer individually, as explained earlier. This shows that the reward a Sala'at said in Jama'at is exalted by a function, as defined in the right hand side of the equation (2.1). The same equation may also be used for extrapolation and forecasting. Table 3 shows the extrapolated values that how the size of the Jama'at increases the value of the reward of the whole Sala'at. The first column of the Table shows the size of the Jama'at in terms of number of its participants while the second column shows the value of the reward in terms of individuals saying their Sala'at individually. For example, the total divine reward of a Jama'at saying by 10 persons is more than $-7.048 + 11.667 \times 10 - 4.167 \times 10^2 + 0.548 \times 10^3 = 241$ times

that of a Sala'at said by a single person. Similarly, the reward of the Jama'at said by 100 persons is increased by 507,490 times than that said by a single person. The divine reward goes up at a very sharp rate.

A similar analysis for the divine reward per participant of a Jama'at can also be conducted from the Holy saying. Using the same symbols: r for the divine reward, p for the divine reward for a person saying prayers individually instead of a Jama'at, the r can be thought as a function of p . Using the last row of Table 1, possible options for a representing curve are shown in Figure 3.

Figure 3 suggests again a cubic curve for the data being the most representative curve mimicking the data in the Holy saying. As a matter of fact, the R^2 for this cubic curve, also happens to be exactly 1 while none of the other options bears such an exact value of R^2 . The method of least squares gives an equation for the value of reward per person. The forecasting equation turns out to be

$$r_i = -1.548 + 3.542p - 1.104p^2 + 0.110p^3 \quad (2.2)$$

which shows that the value of the reward per person is given by a function given by the right hand side of the equation (2.2). The same equation may also be used for forecasting. The last column of Table 3 shows how this equation may be used for different sizes of the Jama'at. For example, the individual reward of each person in a Jama'at of 15 participants is more than

$$r_i = -1.548 + 3.542 \times 15 - 1.104 \times 15^2 + 0.110 \times 15^3 = 178 \text{ times}$$

than that of a Sala'at said individually.

Table 3 also seems to be solving the confusion which arises while reading Holy sayings, in bullets 1 through 4, one after the other. The saying in bullet 2 goes up to 8 persons while the value of individual divine reward of each participant in a Jama'at of 10 persons is deduced to be more than 37 times more than that of a Sala'at said singly, as per column 2 of Table 3. And this is very near to what is being said in the sayings at bullet 3 and 4. So, there is no confusion in these sayings as the bullet 2 talks in terms of total divine reward of the Jama'at while the latter two sayings talk in terms of individual's reward. In other words, the sayings at bullet 3 or 4 is/are a continuation of the saying in bullet 2.

A general view of these equations is shown in Figure 4, which is a graphical presentation of these two equations, equation (2.1) and (2.2), and shows how the Holy saying in bullet 2 can be deduced to extrapolate the value of reward for different sizes of the Jama'at.

The upper line, in Figure 4, shows the extrapolation of the total divine reward with the size of Jama'at while the lower line, in Figure 4, shows this extrapolation for the value of reward for each individual participant of the Jama'at. A cubic curve with a very sharp slope is the characteristic feature of both of these Figures which shows how rapidly the reward of a Jama'at increases with the size of this Jama'at.

3. Conclusion

The concept of Jama'at is among the most important concepts in Islam. It has been ordained, in the Holy Quran, to "bow down heads (for Sala'at) with those who bow down". There have been many traditions and sayings of Holy Prophet (P.B.U.H.) exalting the status of the Sala'at said in Jama'at, in terms of its divine reward. Further, it has been told (by Holy Prophet) that the reward increases with the size of Jama'at. However, these sayings portrait apparently only a too-little and fragmented figure especially when one wants to read them for the relationship between the value of reward and the size of the Jama'at. Further, different sayings seem to be at odds with each other. It has been attempted in this paper to make deductions and extrapolate the value of this divine reward and connect these, seemingly different and conflicting, sayings to complete the picture.

It has been derived here that the relationship between the reward of a Sala'at said in Jama'at and the size of the Jama'at is cubic, as narrated by Holy Prophet (P.B.U.H.), in nature. This cubic function can thus be used to deduce and extrapolate the value of reward for different sizes of the Jama'at. The same cubic function connects different apparently conflicting sayings of the Holy Prophet (P.B.U.H.).

It should be kept in the mind that the analysis presented here is simply a deduction of the saying of Holy Prophet (P.B.U.H.) and the actual reward of the Sala'at, either said singly or in congregation, is known merely to Allah, the Most Merciful who may exalt the reward many times higher than the figures deduced here.

Table 1: The value of reward as increased by the size of the Jama'at

Persons in Jama'at	1	2	4	8
Total Divine Reward	1	More than 4	More than 8	More than 100
Individual's Reward in the Jama'at	1	More than $4/2=2$	More than $8/4=2$	More than $100/8=12.5$

Table 2: Coefficient of determination, R^2 , for different curves

Type of Curve	R^2
Linear	0.879
Logarithmic	0.658
Inverse	0.407
Quadratic	0.996
Cubic	1
Compound	0.972
Power	0.942
S Curve	0.793
Growth	0.972
Exponential	0.972

Table 3: Forecasted values of the rewards as calculated by curves

Number of Persons	Total Reward of the Jama'at	Individual's Reward within the Jama'at
5	16	6
10	241	37
15	1080	178
20	2943	512
25	6243	1121
30	11389	2088
40	28864	5423
50	58659	11179
100	507490	99356
300	14424463	2872064
500	67464076	13476773

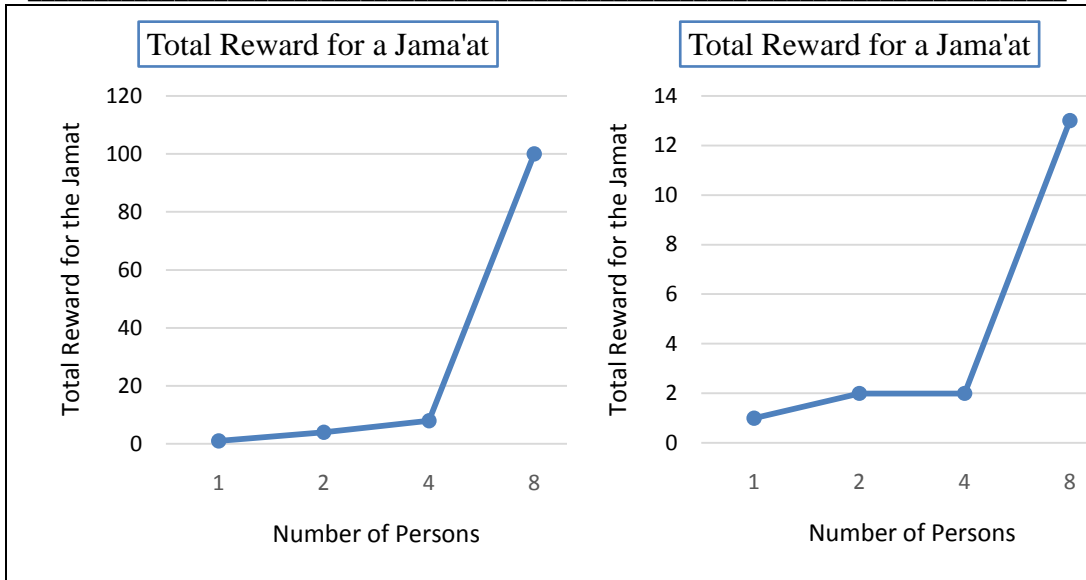


Figure 1: Graphical depiction of the Hadith

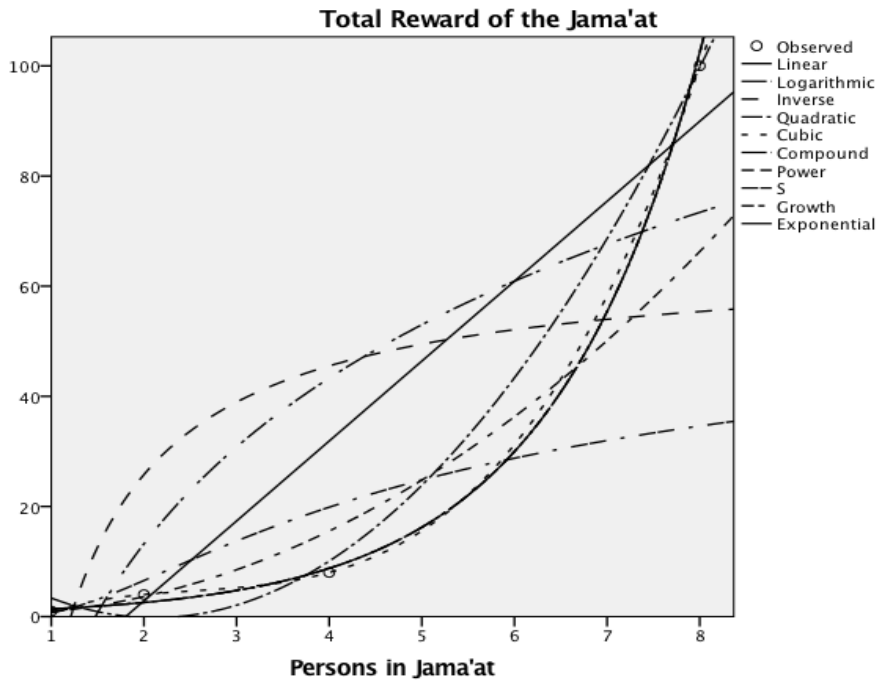


Figure 2: Possible curve choices for the data

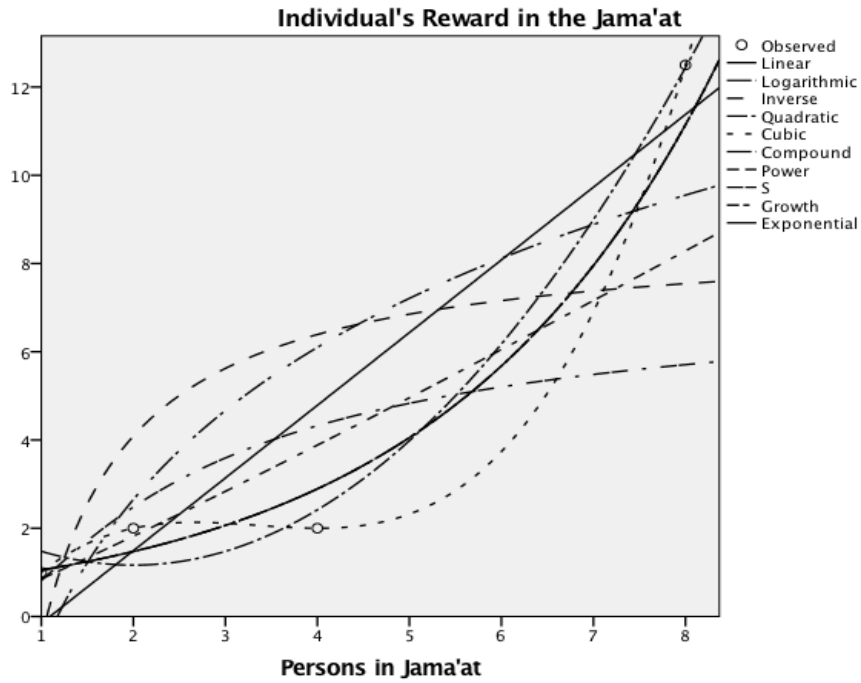


Figure 3: Possible curves for the divine reward per participant

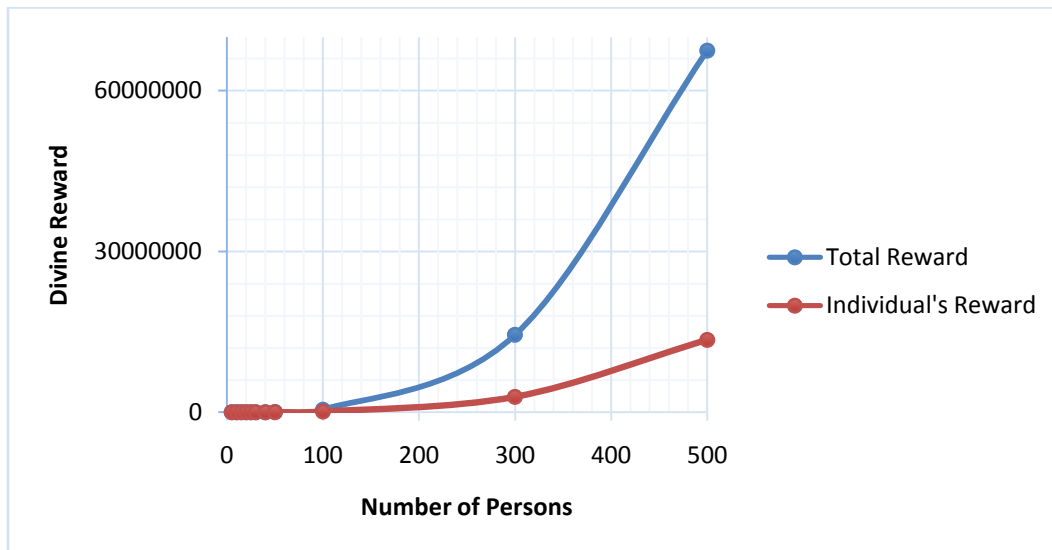


Figure 4: Extrapolated divine rewards for a Jama'at

References

1. Abu Dawud (2:554). Sunun Abu Dawud, Chapter 2: Prayer. Dar al-Fikr.
2. Al-Bazzar and Tabarani (1352). Masnud of Abu Bakr al-Bazzarand Al-Tabarani. Majma al-Zawa'id by Ali ibn Abu Bakr al-Haythami. Mu'assash al-Ma'arif, Beirut.
3. Bukhari, M. (1:8:466). Sahih al-Bukhari, Chapter 1: Book 8; Prayer. Dar al-Fikr.
4. Muslim, I. H. (4:1477). Sahih al-Muslim, Book 4; Prayer. Dar al-Fikr.
5. Plackett, R. L. (1972). Studies in the history of probability and statistics XXIX: The discovery of the method of Least Squares. *Biometrika*, **59(2)**, 239–251.
6. Quran (2:43). “And be steadfast in prayer; Practise regular charity; And bow down your heads with those who bow down (in worship)”. *The Meaning of The Holy Quran* by Abdullah Yusuf Ali. Amana Corporation, Maryland.
7. Qurashi, M. (1983). A statistical analysis of motivation, cooperation and achievement-Part IV formula for increase of value/reward with increasing size of Jama'at/congregation, vis-a-vis mutual interaction. *Science and Technology in the Islamic World*, **1(4)**, 227–235.
8. Siddiqi, A. F. (2013). A statistical analysis for increasing reward with increasing size of Jama'at. *Journal of Islamic Thought and Civilization*, **2**, 39-43.