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Quadratic Distribution Patterns in Kola Analysis

Adekola Alex Taylor*

Mathsthoughtbook, PO Box 1927, Ota, Nigeria.

Abstract

Different sets of ordered system in Kola Analysis of distributive regeneration of ordered system, comprising entities that are grouped into two or more columns and rows in simple dimension, when made to undergo Logico-Sequential Distribution, the Regenerative Distribution Numbers (t) of some of these different sets of ordered system obey quadratic distribution patterns. This paper shows the steps involved in the derivation of the quadratic equations governing the sets of ordered system that exhibit quadratic distribution patterns in Kola Analysis of distributive regeneration of ordered system. For an example, an ordered system where the total number of entities [n (E)] could be expressed in terms of the product of the odd number of columns [C_o] and number of rows [C_o – 2] with each column comprising the same number of entities, the mathematical formula connecting its arrangement and its even Regenerative Distribution Number (t_e) is given as: n (E) = C_o [C_o – 2] = $[t_e]^2 - 1$

Keywords: Distributive regeneration of ordered system, Kola Analysis, Logico-sequential distribution, Quadratic distribution patterns, Regenerative distribution number.

1. Introduction

Kola analysis is the mathematical analysis of Distributive Regeneration of Ordered System (Taylor 2014). Various formulas and proportionalities governing the logical phenomenon of distributive regeneration of ordered system are formulated in Kola analysis through the gathering of data, recognition of patterns in data, analysis of data, and through critical thinking and manipulative skills. By definition, distributive regeneration of ordered system is a phenomenon that occurs when a given ordered system, comprising a number of entities that are grouped into two or more rows and columns, is made to undergo a Logico-Sequential Distribution for the purpose of regeneration (Taylor 2010).

The mathematical concept of distributive regeneration of ordered system came into emergence when it was observed that a set of entities that were orderly grouped into two or more rows and columns, when subjected to Logico-sequential distribution returned to their original arrangement before being distributed after a certain distribution number. Further studies showed that different arrangements of these sets of entities have their own regenerative distribution numbers. Drawing a clue from the Isaac Newton's First Law of Motion, the law of Distributive Regeneration of Ordered System was formulated, and it states that every ordered system, comprising entities which are grouped into two or more rows and columns in a simple or multiple dimensions, has a Regenerative Distribution Number (t), if the entities in the ordered system are compelled to undergo a series of continuous position change by Logico-Sequential Distribution impressed on them (Taylor 2013).

Logico-Sequential Distribution is a distribution phenomenon created to make a given grouped number of entities in an ordered system to undergo a sequential and logical series of position change until all the entities return to their original arrangement before being distributed (Taylor 2013). The regenerated distribution of the starting arrangement (d0) in the distribution cycle is denoted by (dt) while (t), the Regenerative Distribution Number, is defined as the number of transformed distributions it takes for the regeneration of the original state of an ordered system (Taylor 2014).

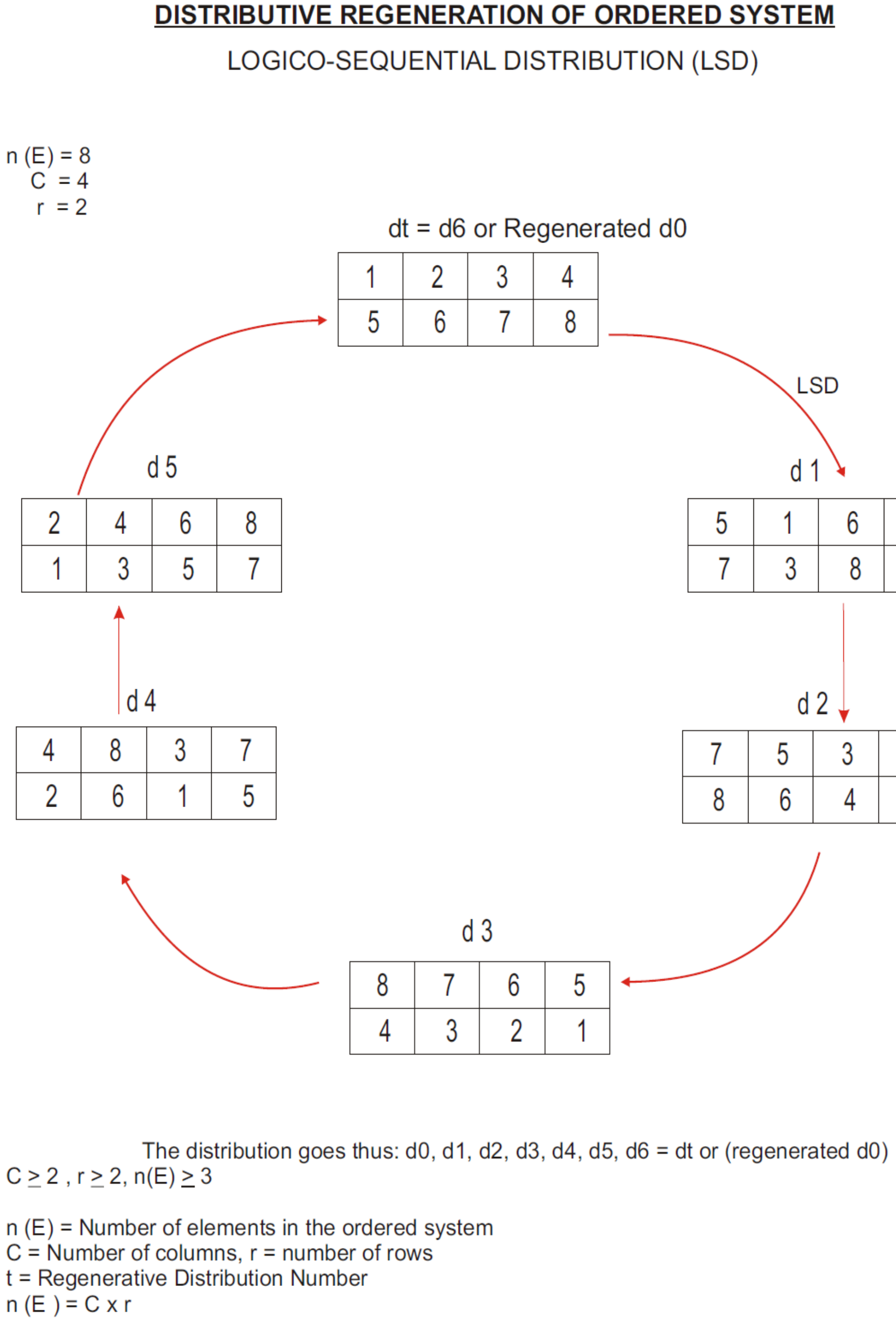

Figure 1: Schematic Representation of Phenomenon of Distributive Regeneration of Ordered System using Logico-Sequential Distribution (Taylor 2010)

When different sets of ordered system comprising entities that are grouped into two or more rows and columns in a simple dimension are made to undergo Logico-Sequential Distribution, their Regenerative Distribution Numbers (t) differ, obeying specific mathematical formulas and proportionalities which could be sequential, inductive, linear, and quadratic. This paper shows the mathematical methodology used in the derivation of the quadratic equations relating the regenerative distribution number (t) with the core features of the arrangement of the ordered system.

2. *The* quadratic distribution patterns

There are quadratic formulas connecting numerical features of the arrangement of ordered systems with their regenerative distribution numbers when sets of ordered system which their total number of entities [n (E)] could be expressed in terms of the product of the number of columns [C] and number of rows [C ± 2], provided that each column has the same number of entities. In this context, an ordered system is a system that comprises a given number of entities that are properly arranged and grouped into two or more columns and rows in such a way that position values can be assigned to each entity in the arrangement (Taylor 2010).

2.1 *Data* Collection and Results

I. [n(E)] = C_o [C_o - 2], when C_o = 5, r = C_o - 2 = 3, [n (E)] = 15, with each column having three entities. Let d0 represents starting arrangement, and let each entity be designated by a number as shown in the Table 1.

Table 1: Schematic representation of arrangement C_o = 5, r = C_o - 2 = 3, [n (E)] = 15, with each column having three entities

d0					**d1**					**d2**				
1	2	3	4	5	11	6	1	12	7	9	2	11	4	13
6	7	8	9	10	2	13	8	3	14	6	15	8	1	10
11	12	13	14	15	9	4	15	10	5	3	12	5	14	7

d3					**d4 = dt**				
3	6	9	12	15	1	2	3	4	5
2	5	8	11	14	6	7	8	9	10
1	4	7	10	13	11	12	13	14	15

The distributive regeneration of ordered system as schematically represented in Table 1 has its distribution series as d0, d1, d2, d3, and d4 or (regenerated d0), since dt = d4, then t_e = 4.

II. [n(E)] = C_o [C_o - 2], when C_o = 7, r = C_o - 2 = 5, [n (E)] = 35, with each column having five entities.

Let d0 represents starting arrangement, and let each entity be designated by a number as shown in Table 2. The distributive regeneration of ordered system of Table 2 has its distribution series as d0, d1, d2, d3, d4, d5, and d6 or (regenerated d0), since dt = d6, then t_e = 6.

Table 2: Schematic representation of arrangement $C_o = 7$, $r = C_o - 2 = 5$, [n (E)] = 35, with each column having five entities

d0							**d1**							**d2**						
1	2	3	4	5	6	7	29	22	15	8	1	30	23	13	26	3	16	29	6	19
8	9	10	11	12	13	14	16	9	2	31	24	17	10	32	9	22	35	12	25	2
15	16	17	18	19	20	21	3	32	25	18	11	4	33	15	28	5	18	31	8	21
22	23	24	25	26	27	28	26	19	12	5	34	27	20	34	11	24	1	14	27	4
29	30	31	32	33	34	35	13	6	35	28	21	14	7	17	30	7	20	33	10	23
d3							**d4**							**d5**						
17	34	15	32	13	30	11	25	14	3	28	17	6	31	5	10	15	20	25	30	35
28	9	26	7	24	5	22	20	9	34	23	12	1	26	4	9	14	19	24	29	34
3	20	1	18	35	16	33	15	4	29	18	7	32	21	3	8	13	18	23	28	33
14	31	12	29	10	27	8	10	35	24	13	2	27	16	2	7	12	17	22	27	32
25	6	23	4	21	2	19	5	30	19	8	33	22	11	1	6	11	16	21	26	31

d6 = dt						
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35

The same procedures were repeated for various arrangements of [n (E)] = C[C ± 2] to get the corresponding values of regenerative distribution number (t) as presented in Table 3

Table 3: Values for n (E) = C[C ±2] and t

n (E) = C [C + 2]	**(t)**		**n (E) = C_o [C_o - 2]**	**(t_e)**
8 = 2 x 4	3		15 = 5 x 3	4
15 = 3 x 5	4		35 = 7 x 5	6
24 = 4 x 6	5		63 = 9 x 7	8
35 = 5 x 7	6		99 = 11 x 9	10
48 = 6 x 8	7		143 = 13 x 11	12
63 = 7 x 9	8		**n (E) = C_e [C_e - 2]**	**(t_e)**
80 = 8 x 10	9		8 = 4 x 2	6
99 = 9 x 11	10		24 = 6 x 4	10
120 = 10 x 12	11		48 = 8 x 6	14
143 = 11 x 13	12		80 = 10 x 8	18
			120 = 12 x 10	22

A graph of $C_o [C_o - 2]$ against (t_e) as shown in Figure 2 gives a quadratic graph with roots of equation as -1 and 1 respectively.

Therefore, when [n (E)] = $C_o [C_o - 2] = 0$, (t) = 1 or -1

$$[t_e]^2 - 1 = 0 \qquad (1)$$

When (t_e) = 0,

$[n(E)] = C_o[C_o - 2] = -1$ (2)

Harmonizing equations 1 and 2 derived from the graph of $[n(E)] = C_o[C_o - 2]$ against (t_e) gives:

$C_o[C_o - 2] = [t_e]^2 - 1$

Therefore in Kola analysis of Distributive regeneration of ordered system, if a given number of entities [n (E)] are grouped into odd number of columns $[C_o]$ and rows [r] in simple dimension in such a way that $r = C_o - 2$, and $C_o[C_o - 2] = [n(E)]$, the mathematical relationship of $C_o[C_o - 2]$ and its even regenerative distribution number (t_e) is given as:

$C_o[C_o - 2] = [t_e]^2 - 1$ (3)

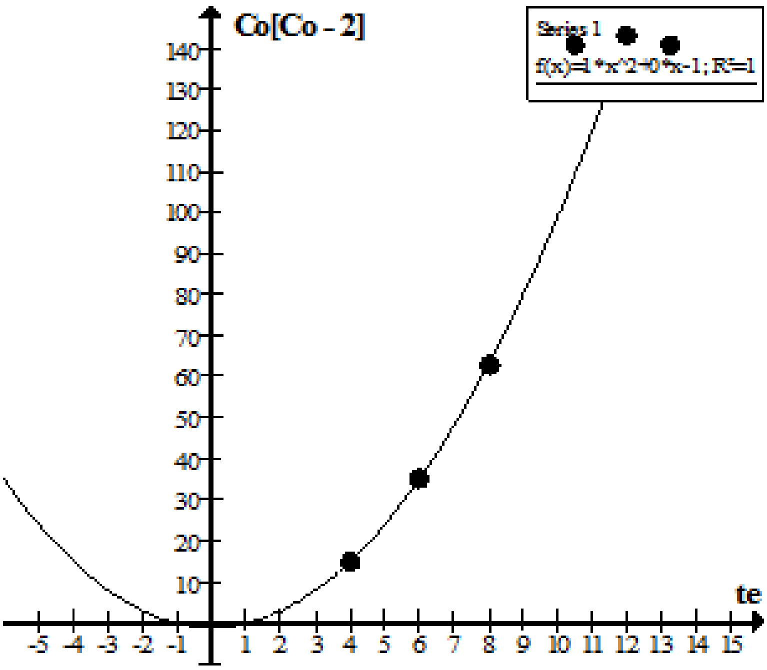

Figure 2: A graph of $C_o[C_o - 2]$ against (t_e)

Other formulas that can be derived by plotting the graph of $C[C \pm 2]$ against (t) using the values for n (E) $= C[C \pm 2]$ and (t) in Table 3 are as follows:

$n(E) = C[C + 2] = t^2 - 1$ (4)

$n(E) = C_o[C_o + 2] = [t_e]^2 - 1$ (5)

$n(E) = C_e[C_e + 2] = [t_o]^2 - 1$ (6)

According to Taylor (2010), the graph of $C_e[C_e - 2]$ against (t_e) as shown in Figure 3 gives a quadratic equation with -2 and 2 as roots of equation as opposed to -1 and 1 for other sets of ordered system in the same category n (E) $= C[C \pm 2]$.

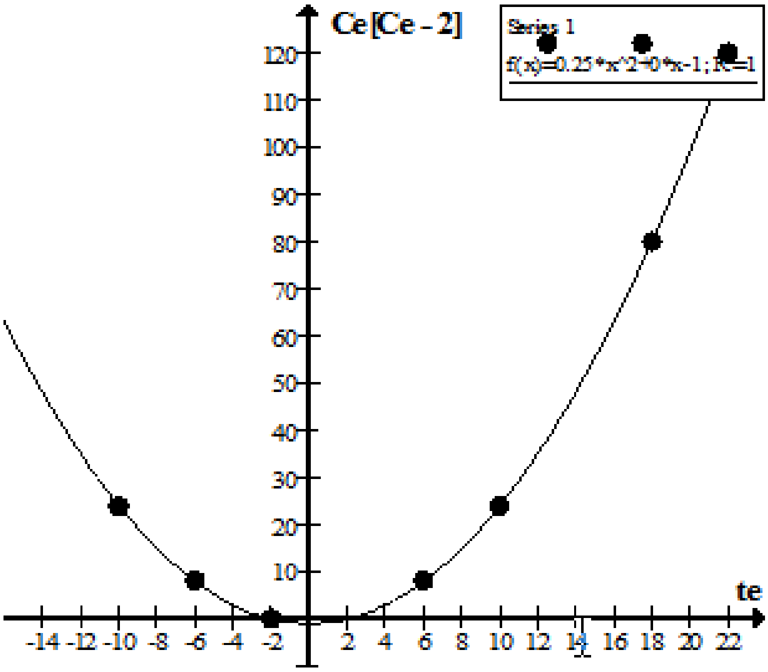

Figure 3: A graph of $C_e\,[C_e - 2]$ against (t_e)

$$C_e\,[C_e - 2] = \tfrac{1}{4}\,[t_e]^2 - 1 \qquad (7)$$

[C_e] denotes even number of column, (t_o) denotes odd regenerative distribution number

3. Problems

Problem 1

A student grouped 195 cards into 15 columns with each column having 13 cards. If his distribution mechanism obeys the phenomenon of distributive regeneration of ordered system, calculate the Regenerative Distribution Number (t) of the arrangement.

Solution

n (E) = 195, $C_o = 15$, $r = C_o - 2 = 13$

n (E) can be expressed in terms of $C_o[C_o - 2]$. It follows that $C_o\,[C_o - 2] = [t_e]^2 - 1$

$195 = 15 \times [15 - 2] = [t_e]^2 - 1$

$[t_e]^2 - 1 = 195$

$[t_e]^2 - 1 - 195 = 0$

$t_e = -14$ or 14, since we are dealing with concrete things, then $t_e \neq -14$ but $t_e = 14$

Therefore, the even Regenerative Distribution Number (t_e) of the arrangement is 14

Problem 2

168 students are required in a football match opening ceremony to make a parade to grace the occasion. If they are grouped into 14 columns with each column having 12 students, and if their parade mechanism obeys the phenomenon of distributive regeneration of ordered system, calculate the Regenerative Distribution Number (t) of their arrangement.

Solution

n (E) = 168, $C_e = 14$, $r = C_e - 2 = 12$

n (E) can be expressed in terms of $C_e[C_e - 2]$. It follows that $C_e [C_e - 2] = 1/4[t_e]^2 - 1$

$168 = 14 \times [14 - 2] = 1/4[t_e]^2 - 1$

$1/4[t_e]^2 - 1 = 168$

$t_e = -26$ or 26, since we are dealing with concrete things, then $t_e \neq -26$ but $t_e = 26$

Therefore, the even Regenerative Distribution Number (t_e) of their arrangement is 26

4. Conclusion

The mathematical formulas relating n (E) = C[C ± 2] arrangement category in simple dimension and their distributive regenerative numbers obey quadratic distribution patterns. The methodology explored in deriving the quadratic distribution formulas for n (E) = C[C ± 2] arrangement category in simple dimension revolves around the various kinds of thinking and reasoning, such as deduction, association, creation, plausible inference, and induction (Ostler 2011). It is evident that the practical application of various aspects of Kola Analysis would enhance the teaching, research, training, manipulative and conceptual skills, and innovation in the field of mathematical sciences both at the secondary and tertiary school levels. The formulas governing the quadratic distribution patterns in Kola Analysis of distributive regeneration of ordered system in simple dimension could also have significant implications for intelligence game development, computer programming, and software development.

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