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Newspaper Reading Patterns among Different Age-Groups

The Research Paper is the Analysis of Newspaper Reading Patterns among Different Age Groups

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Abstract:- The research paper is the analysis of age playing a major factor in the newspaper reading patterns. It establishes a relation between Reading frequency and Reading Platforms and Birth Year. A series of statistical tools are used for the same.

I. INTRODUCTION

The research is about the Newspaper reading patterns. The aim of this research is to establish a relation between age and the reading frequency and preferred reading platforms of newspaper. For this, an online survey was conducted. The primary data from the survey is used for the analysis of the research. The data has 780 responses. The birth year ranges from 1960 to 2009. The statistical tools used for the analysis are 'Moving Averages', 'Least Square Regression and Trend' and 'Correlation'.

II. UNDERSTANDING THE DATA

The data collected from the online survey has Birth Year, Reading Frequency of Newspaper (which consists of options like 'Everyday', 'Sometimes', 'Never' where values assigned to them are 3, 2 and 1 respectively), Reading Platform of Newspaper (which consists of options like 'Traditional Newspaper', 'News channels on Television', News on Mobile Apps', 'Any social media platforms' where values assigned to them are 4, 3, 2 and 1).

III. ANALYSIS

A. Pivot Table

Firstly, the data has been sorted by using the Pivot Table.

A pivot table is a table of statistics that summarizes the data of a more extensive table (such as from a database, spreadsheet, or business intelligence program). This summary might include sums, averages, or other statistics, which the pivot table groups together in a meaningful way. Pivot tables are a technique in data processing. They arrange and rearrange (or "pivot") statistics in order to draw attention to useful information.

The values are summarized by average for each year. The average summarization helps to understand the tendency of people of every age group.

The pivot table for the data is as follows:

Pivot Table of the Data		
Birth Year	***Average of Reading Frequency***	***Average of Reading Platform***
1960	3	3
1961	3	3
1962	3	3
1963	3	3
1964	3	3
1965	3	3
1966	3	3
1967	3	3
1968	3	3
1969	3	2
1970	3	3
1971	3	4
1972	3	3

1973	3	3
1974	3	4
1975	3	4
1976	3	3
1977	3	3
1978	3	2
1979	3	3
1980	3	3
1981	3	3
1982	3	3
1983	3	3
1984	2	3
1985	3	3
1986	2	3
1987	3	3
1988	3	3
1989	2	3
1990	3	3
1991	3	3
1992	3	3
1993	2	3
1994	2	2
1995	2	3
1996	2	2
1997	2	2
1998	2	2
1999	3	2
2000	2	2
2001	2	2
2002	2	2
2003	2	2
2004	2	2
2005	2	2
2006	2	3
2007	1	3
2008	2	1
2009	2	4
Grand Total	3	3

Table 1

B. Moving Averages

A moving average (MA) is a widely used indicator in technical analysis that helps smooth out value action by filtering out the "noise" from random short-term fluctuations. It is a trend-following, or lagging, indicator because it is based on past values.

➢ *Moving Average of Newspaper Reading Frequency*

The moving average of reading frequency analyses the trend of reading frequency among different ages. The following is the 5 yearly moving average of Reading Frequency:

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5 Yearly Moving Average of Reading Frequency		
Birth Year	***Average of Reading Frequency***	***5 Yearly Moving Average***
1960	3	#N/A
1961	3	#N/A
1962	3	#N/A
1963	3	#N/A
1964	3	3
1965	3	3
1966	3	3
1967	3	3
1968	3	3
1969	3	3
1970	3	3
1971	3	3
1972	3	3
1973	3	3
1974	3	3
1975	3	3
1976	3	3
1977	3	3
1978	3	3
1979	3	3
1980	3	3
1981	3	3
1982	3	3
1983	3	3
1984	2	3
1985	3	3
1986	2	3
1987	3	3
1988	3	2
1989	2	2
1990	3	2
1991	3	2
1992	3	2
1993	2	2
1994	2	3
1995	2	3
1996	2	2
1997	2	2
1998	2	2
1999	3	2
2000	2	2
2001	2	2
2002	2	2
2003	2	2
2004	2	2
2005	2	2
2006	2	2
2007	1	2
2008	2	2
2009	2	2

Table 2

The graphical representation of the 5 yearly moving average is:

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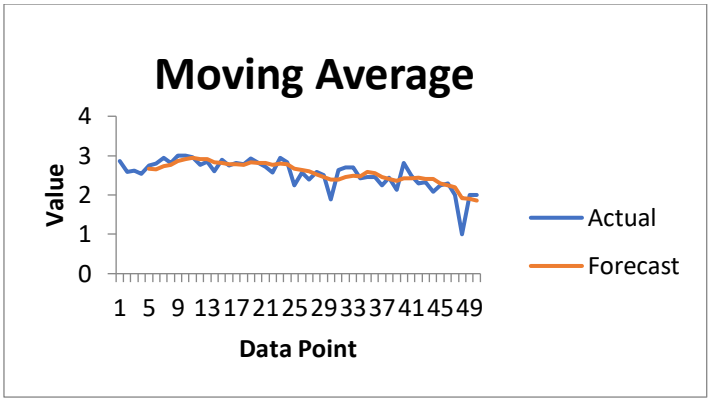

Fig 1

Interpretation: The 5 Yearly Moving Average of Reading Frequency indicates a downward sloping trend. In our analysis, it means that the older generation reads newspapers daily whereas the younger generation reads newspaper occasionally. The further generations will read newspaper less frequently or not at all.

➢ *Moving Average of Newspaper Reading Platform*

The moving average of reading platforms analyses the trend of reading platforms among different ages. The following is the 5 yearly moving average of Reading Platforms:

5 Yearly Moving Average of Reading Platform		
Birth Year	***Average of Reading Platform***	***5 Yearly Moving Average***
1960	3	#N/A
1961	3	#N/A
1962	3	#N/A
1963	3	#N/A
1964	3	3
1965	3	3
1966	3	3
1967	3	3
1968	3	3
1969	2	3
1970	3	3
1971	4	3
1972	3	3
1973	3	3
1974	4	3
1975	4	4
1976	3	3
1977	3	3
1978	2	3
1979	3	3
1980	3	3
1981	3	3
1982	3	3
1983	3	3
1984	3	3
1985	3	3
1986	3	3
1987	3	3
1988	3	3
1989	3	3
1990	3	3
1991	3	3
1992	3	3
1993	3	3

1994	2	3
1995	3	3
1996	2	3
1997	2	2
1998	2	2
1999	2	2
2000	2	2
2001	2	2
2002	2	2
2003	2	2
2004	2	2
2005	2	2
2006	3	2
2007	3	2
2008	1	2
2009	4	3

Table 3

The graphical representation of the 5 yearly moving average of Reading Platforms is:

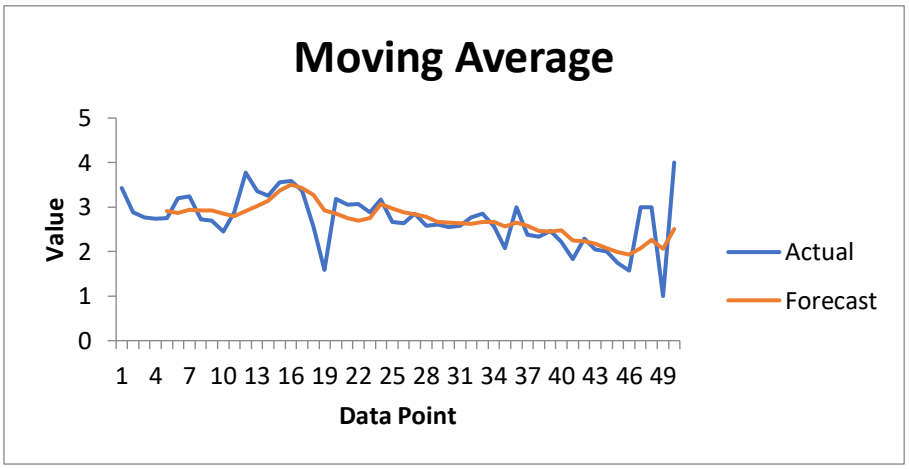

Fig 2

Interpretation: The 5 Yearly Moving Average of Reading Platform indicates a downward sloping trend and an upward trend at the end. This represents that the older generation reads the traditional newspaper and News Channels on Television whereas the younger generation is more tech-savvy and reads news on Mobile Apps. However, some exceptions exist.

C. Least Square Regression and Trend

The Least Squares Regression Line is the line that makes the vertical distance from the data points to the regression line as small as possible. It's called a "least squares" because the best line of fit is one that minimizes the variance (the sum of squares of the errors).

The most important application is in data fitting. The best fit in the least-squares sense minimizes *the sum of squared residuals* (a residual being: the difference between an observed value, and the fitted value provided by a model). When the problem has substantial uncertainties in the independent variable (the *x* variable), then simple regression and least-squares methods have problems; in such cases, the methodology required for fitting errors-in-variables models may be considered instead of that for least squares.

- *Least Square Regression and Trend of Reading Frequency*

The least square regression is analyses the regression of Average of Reading Frequency. It also plots the trend and estimates the trend values in 2019. The regression estimates the trend in this analysis.

The Estimation of Reading Frequency by Least Square Regression and Trend is as follows:

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Estimation of Reading Frequency in 2019 by Least Square Method			
Birth Year	***Average of Reading Frequency(Y)***	***X=(Year – Middle Year)/0.5***	***Y=a+bX***
1960	3	-49	3
1961	3	-47	3
1962	3	-45	3
1963	3	-43	3
1964	3	-41	3
1965	3	-39	3
1966	3	-37	3
1967	3	-35	3
1968	3	-33	3
1969	3	-31	3
1970	3	-29	3
1971	3	-27	3
1972	3	-25	3
1973	3	-23	3
1974	3	-21	3
1975	3	-19	3
1976	3	-17	3
1977	3	-15	3
1978	3	-13	3
1979	3	-11	3
1980	3	-9	3
1981	3	-7	3
1982	3	-5	3
1983	3	-3	3
1984	2	-1	3
1985	3	1	3
1986	2	3	3
1987	3	5	2
1988	3	7	2
1989	2	9	2
1990	3	11	2
1991	3	13	2
1992	3	15	2
1993	2	17	2
1994	2	19	2
1995	2	21	2
1996	2	23	2
1997	2	25	2
1998	2	27	2
1999	3	29	2
2000	2	31	2
2001	2	33	2
2002	2	35	2
2003	2	37	2
2004	2	39	2
2005	2	41	2
2006	2	43	2
2007	1	45	2
2008	2	47	2
2009	2	49	2
2019		69	2

Table 4

The Value of 2019 is the estimated trend value. Here, the values ‘a’ and ‘b’ used in estimating Y are found by regression. These values are 2.54056029182924 and -0.00894250908634371 respectively.

The graphical representation of Y estimated and actual reading frequency is as follows:

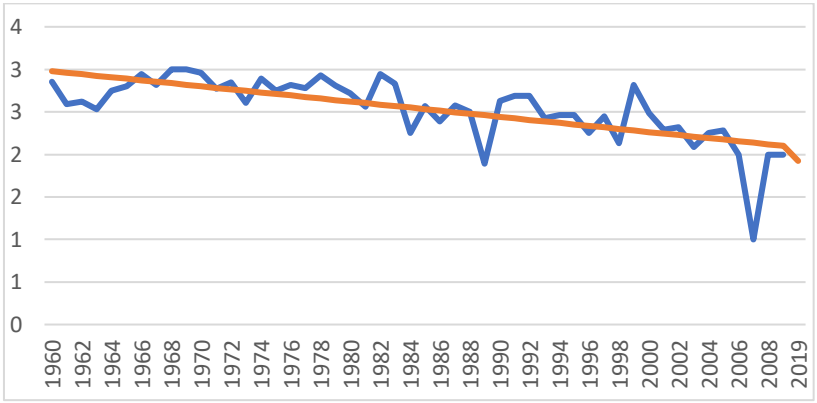

Fig 3

Interpretation: The Least Square Method of Time Series interpretes a downward sloping trend of reading frequency as the age decreases. Hence it means that the older generation reads newspapers daily whereas the younger generation reads newspaper occassionally. The trend estimates the reading frequency of people born in 2019 and it turns out to be 'Sometimes'. Hence the next generation will also see a gradual decline in the reading frequency of the newspapers.

➢ *Least Square regression and trend of Reading Platform*

The least square regression is analyses the regression of Average of Reading Platform. It also plots the trend and estimates the trend values in 2019. The regression estimates the trend in this analysis.

The Estimation of Reading Frequency by Least Square Regression and Trend is as follows:

Estimation of Reading Platform in 2019 by Least Square Method			
Birth Year	***Average of Reading Platform***	***X= (Year-Middle Year)/0.5***	***Y = a+bX***
1960	3	-49	3
1961	3	-47	3
1962	3	-45	3
1963	3	-43	3
1964	3	-41	3
1965	3	-39	3
1966	3	-37	3
1967	3	-35	3
1968	3	-33	3
1969	2	-31	3
1970	3	-29	3
1971	4	-27	3
1972	3	-25	3
1973	3	-23	3
1974	4	-21	3
1975	4	-19	3
1976	3	-17	3
1977	3	-15	3
1978	2	-13	3
1979	3	-11	3
1980	3	-9	3
1981	3	-7	3
1982	3	-5	3
1983	3	-3	3
1984	3	-1	3
1985	3	1	3
1986	3	3	3
1987	3	5	3
1988	3	7	3

1989	3	9	3
1990	3	11	3
1991	3	13	3
1992	3	15	3
1993	3	17	3
1994	2	19	3
1995	3	21	3
1996	2	23	2
1997	2	25	2
1998	2	27	2
1999	2	29	2
2000	2	31	2
2001	2	33	2
2002	2	35	2
2003	2	37	2
2004	2	39	2
2005	2	41	2
2006	3	43	2
2007	3	45	2
2008	1	47	2
2009	4	49	2
2019		69	2

Table 5

The Value of 2019 is the estimated trend value. Here, the values of ‘a’ and ‘b’ are 2.71507528974119 and -0.00951190876339264 respectively which are found through regression.

The graphical representation of Y estimated and actual reading platform is as follows:

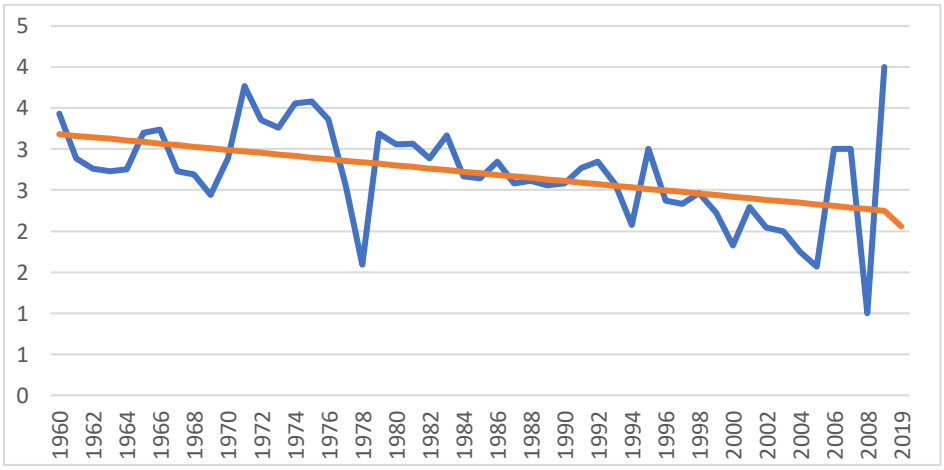

Fig 4

Interpretation: The Least Square Method of Time Series interpretes a downward sloping trend of reading platform as the age decreases. This means that the older generation reads the traditional newspaper and News Channels on Television whereas the younger generation reads news on Mobile apps and will gradually switch to other social media platforms. The trend estimates the preferred reading platform of people born in 2019 and it turns out to be ‘Mobile Apps’. Hence, the next generation will also see a gradual shift toward more tech-savvy options like social media platforms.

D. Correlation

The correlation coefficient is a measure of linear association between two variables. Values of the correlation coefficient are always between −1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense, a correlation coefficient of −1 indicates that two variables are perfectly related in a negative linear sense, and a correlation coefficient of 0 indicates that there is no linear relationship between the two variables.

The correlation between Birth Year, Average of Reading Frequency and Average of Reading Platform is found by Multiple Correlation method.

Multiple Correlation			
	Birth Year	Average of Reading Frequency	Average of Reading Platform
Birth Year	1		
Average of Reading Frequency	-0.705879	1	
Average of Reading Platform	-0.471762	0.251147184	1

Table 6

Interpretation: The correlation of Average Reading Frequency and Birth Year is -0.705878592 and represent negative imperfect correlation. It indicates a strong negative linear relationship between these variables. The correlation between Average Reading Platform and Birth Year is -0.471762174 and represent a negative imperfect correlation. It indicates a weak negative linear relationship between these variables. The correlation between Average Reading Platform and Average Reading Frequency is 0.251147184 and represent a The correlation between Average Reading Platform and Average Reading Frequency is 0.251147184 and represent a positive imperfect correlation. It indicates a weak positive linear relationship between these variables.

IV. CONCLUSION

The research establishes the functional relationship between age and the newspaper reading patterns. The said relationship has been established by Moving Averages, Least Square regression and Trend Analysis and Correlation. The data has an birth year ranging from 1960 to 2009. The data predicts the patterns in 2019. There will further be a downward trend in the newspaper Reading Frequency. Also, the future generations will have a more tech-savvy approach towards reading newspaper which is evident in research.

REFERENCES

The concepts are explained with the help of various sources. The list of the sources is as follows :

[1]. https://searchsqlserver.techtarget.com/
[2]. www.investopedia.com
[3]. www.wikipedia.com
[4]. https://www.britannica.com/