iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 8 **Issue:** IV **Month of publication:** April 2020

DOI: http://doi.org/10.22214/ijraset.2020.4085

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue IV Apr 2020- Available at www.ijraset.com

The Influence of Birth Month on Grit and Grades attained in Higher Secondary Examination

Joy Kevin[1], Menon Keerthana K[2], George Diya Elsa[3]
[1, 2, 3]*3rd B.Sc. Student, Department of Psychology, Christ College Irinjalakuda*

Abstract: ***Grit is a persistent passion towards a goal or an object to reach an individual's maximum potential. The purpose of the study is to determine the influence of birth month on a student's grit and grades attained in higher secondary examination. The sample consisted of 395 undergraduate college students selected randomly from Irinjalakuda municipality. Grit (Short grit scale), Marks obtained in higher secondary examination, and birth month were collected from the selected sample population. The result has concluded that there exists no relation between grit of a student and their birth month, but a significant relation has found between Mark attained in higher secondary examination with their birth month. It was also found that children who were born in August have significantly higher marks than those who were born in April and October.***
Keywords: Grit, Birth month, Grade, Temperature, Humidity.

I. INTRODUCTION

Grit is a kind of persistent passion towards a goal or an object to reach an individual's maximum potential. It's an amalgamation of passion and perseverance. Passion can be described as an extra effort acted upon by something, then it is required to accomplish the task. Passion is the desire which is worked upon to accomplish a preferred task by putting the body, mind and soul into action. According to the Cambridge dictionary, Perseverance is the "continued effort and determination". A person who is having high perseverance won't give up easily in the face of intense difficulties and failures. Gritter individuals consider their path to success as a marathon rather than a hundred-meter sprint. Stamina and willpower are the two factors which help them in reaching their desired outcomes. Less gritty people get demotivated and feel boredom often while chasing their desired goals than gritter pears. Grit has the ability to sustain interest and effort, even if the task takes a long time to be fruitful. According to Duckworth, gritty individuals possess certain common attributes and they are interest, purpose, practice and hope. Interest can be described as the path we choose from thousands of possibilities. According to dictionary.com purpose can be defined as "the reason for which something exists or is done, made, used, etc. "Purpose acts as a fuel for our passion. It gives us a meaning to live and pushes us towards attaining our desired goals. According to Angelina Duckworth's book [8] "practice requires working where challenges exceed skill." The main purpose of practice is to acquire skill and knowledge about certain areas of interest. By continuous practice, the 'lack of skill' or 'experience 'of an individual can be dramatically improved. Hope is an important driving factor which helps us to push through difficulties and hardships which arise in our life. Hope can be described as a positive expectation towards achieving the desired goal. It is hard to attain success without having a hopeful attitude. There are researches associating the relation between grit with achievement [10], [11], [12], [9] and wellbeing [16].

Marks are not the measure of an individual nor are they the only real determinant of educational accomplishment. They're just one rather imperfect reflection of what quantity you've learned in a specific period of time [6]. Even though all its fault grades play an important role in our current society. it helps to evaluate and predict the future accomplishments of an individual. In India, a student's whole career can be dramatically influenced by the grades they attain in their final higher secondary examination. They have the potential to build or break the dreams of aspiring students. The understanding of the influence of environmental factors in brain development is an important area for modern psychology. Environmental factors such as climate variations, latitudinal variations, summer and winter differences, temperature and rain intensity in different seasons, the number of infectious agents, our sleeping and eating habits, physical activity, social interactions can influence the development of our brain that results in main physiological and psychological differences. Individual's season of birth may influence the developmental stages of people during their conception, gestation, or the perinatal period. Main neurological and psychiatric disorders are associated with the season of birth [22]. Season of birth also has a major role in schizophrenia [5], [21], epilepsy [15], brain tumour [1]. Season of birth even has an influence on our personality traits. The winter born people have a lower level of novelty-seeking personality traits than summer-born counterparts [3],[2]. It is established that children born in autumn have higher academic achievements than the children born in summer [17], [18], [13]. There are studies associating the relationship between the month of birth and academic achievement [4], [20], [19], [14].

II. SCOPE AND SIGNIFICANCE OF THE STUDY

As the world evolves, academic success is becoming more and more important than ever in an individual's life. This research will help the governments to prioritize and develop programs that could target the academic performance of students. Institutions can be made aware of the factors which are in play when it comes to academic performance. The study will give a deeper understanding to the students and their parents about the influence of environmental factors in the developmental stage of the brain.

III. AIM

The aim of the study is to determine the influence of birth month on a student's grit and grades attained in higher secondary examination.

IV. HYPOTHESES

There exists no statistically significant relation between the student's birth month and grit.
There exists no statistically significant relation between the student's birth month and grades attained in higher secondary examination.

V. PROCEDURE

Undergraduate college students were randomly selected from the Irinjalakuda municipality for the study. Grit, marks obtained in higher secondary examination, and birth month were collected from the sample population. The data obtained were analysed using ANOVA (Analysis of variance) and Games-Howell post-hoc tests to test the hypothesis.

VI. METHOD

The sample consisted of 395 undergraduate college students selected randomly from Irinjalakuda municipality. Grit of the college students were collected using 8-item short grit scale developed by Angela Duckworth (2009) with a consistency of interest alphas ranging from .73 to .79, overall internal consistency ranging from .73 to .83 and perseverance of effort alphas ranging from .60 to .78. Students' marks obtained in higher secondary examination and birth month were also collected from the sample population.

VII. RESULT & DISCUSSION

The aim of the study is to determine the influence of birth month on a student's grit and grades attained in higher secondary examination. Statistical Package for the Social Sciences 25 (SPSS 25) were used to perform one-way ANOVA on birth month with grit and marks obtained to determine the influence of birth month on student's grit and grades attained in higher secondary examination.

TABLE I
Descriptive statistics and one-way ANOVA of Students grit with Birth month

Month	N	M	SD	Skew	Kurtosis	F-value	Sig.
1	38	3.64145	0.693948	-0.173	-0.39	0.565	0.857
2	30	3.62917	0.630137	-0.225	0.621		
3	30	3.84583	0.709908	0.539	0.439		
4	31	3.89919	0.811005	0.051	0.257		
5	37	3.72297	0.755842	-0.107	-0.076		
6	35	3.77143	0.772033	-0.185	-0.534		
7	39	3.83013	0.687343	-0.263	-0.162		
8	32	3.82031	0.714155	-0.074	-0.284		
9	32	3.83984	0.833542	-0.194	-0.378		
10	30	3.63333	0.588991	-0.201	0.009		
11	32	3.84375	0.72956	0.706	0.384		
12	30	3.8375	0.680826	-0.088	-0.794		

The descriptive statistics associated with student's grit across their birth month are reported in table 1. From the table, it can be observed that students who were born in February have the lowest mean grit (M=3.629) and students who were born in April have the highest mean grit (M=3.899). Skew and kurtosis were checked to find out they have followed the normal distribution curve

(Schmider, 2010). Further, the homogeneity of variances was also considered the basis of Levene's F test, F (11, 384) =. 341, p =. 976. A between-group ANOVA was performed to determine the effect of Students grit on their birth month and it yielded no statistically significant effect F (11, 384) =. 565, p =. 857. Thus, the null hypothesis was accepted as there are no differences between the group means. There is no difference in the grit of a student when the birth month is considered. This could be due to the fact that grit develops and incises throughout life with the influence of environmental factors.

TABLE II
Descriptive statistics and one-way ANOVA of Students marks obtained with Birth month

Month	N	M	SD	Skew	Kurtosis	F-value	Sig.
1	35	86.86	7.484	-1.583	3.316	2.721	0.01
2	26	85.42	7.049	-0.308	-0.044		
3	27	87.52	6.098	-0.595	-0.548		
4	28	81.04	9.493	-1.224	1.68		
5	35	85.43	6.213	-0.482	0.175		
6	32	84.22	8.522	-0.413	-0.603		
7	33	85.94	7.57	-0.552	-0.314		
8	29	89.17	4.544	-1.155	1.887		
9	27	85.07	7.585	-1.08	0.985		
10	26	83.31	6.632	-0.387	-0.917		
11	29	88.14	5.866	-0.58	-0.339		
12	27	83.67	9.323	-0.731	-0.15		

The descriptive statistics is associated with a student's higher secondary mark and their month of birth. From the table, it can be observed that April has the lowest mean mark(M=81.04) and August has the highest mean mark (M=89.17). It is clear from the table that data follows the normality curve when considering skewness and kurtosis (Schmider, 2010). Using Levene's F test, homogeneity of variances were also tested and found that the data is not homogeneous F (11, 342) = 2.371, p =. 008. To determine the effect of birth month on a student's mark, ANOVA was performed, and a statistically significant result has been obtained F (11, 342) = 2.721, p =. 002. Statistically significant ANOVA was followed up with Games-Howell post-hoc tests (Hayter, 1989). The test has concluded that there is a statistically significant mean difference between April and August (M=-8.137, p= .010) and October and August (M=-5.865, p=.021). Thus, the null hypothesis was rejected. Prior researches had found similar results that there exists a relation between a student's birth month and their grade (Crawford et al, 2011; Sykes et al, 2009; Sprietsma, 2010; Oshima et al, 2006). This could be due to the fact that the climate and temperature could have a significant influence on brain development in early infants.

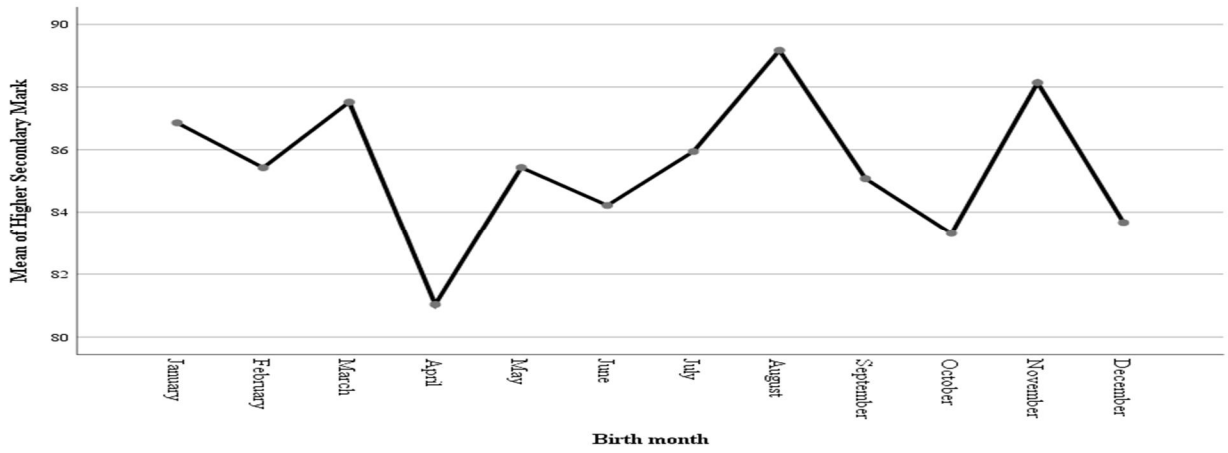

Fig. 1 Mean plot of Birth month on Students higher secondary marks

VIII. CONCLUSION

From the research, it can be concluded that there exists no relation between grit of a student and their birth month. But a significant relation has been found between Mark attained in higher secondary examination with their birth month. It was also determined that children who were born in August have significantly higher marks than those who were born in April and October.

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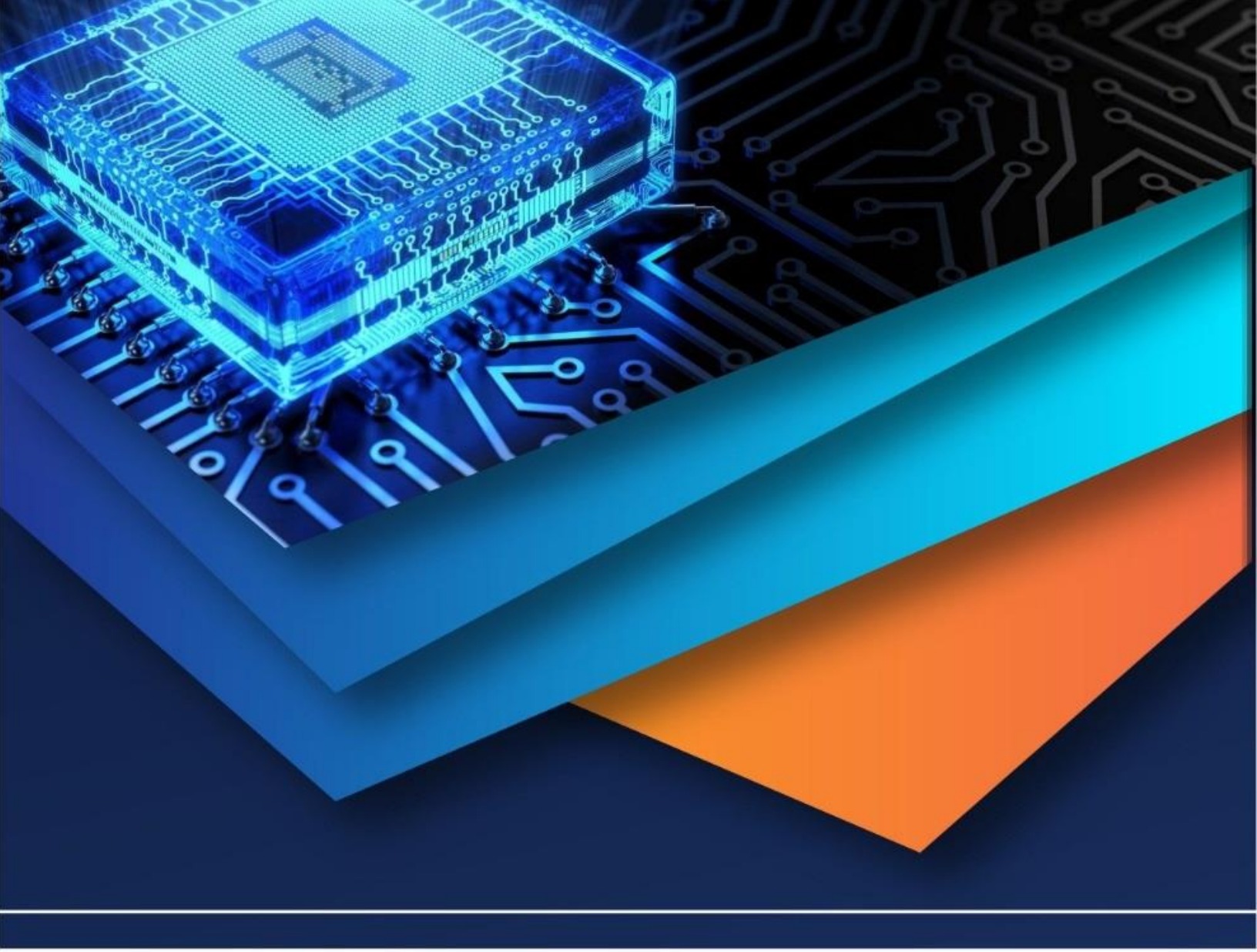

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