



RESEARCH ARTICLE

A STUDY ON WORD FLUENCY, A DIMENSION OF DIVERGENT PRODUCTION ABILITY OF HIGHER SECONDARY STUDENTS

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ABSTRACT

This study investigates Word Fluency, a dimension of Divergent Production Ability (DPA) of first year higher secondary students of Cuddalore town. Stratified Random Sampling method is adopted for choosing the sample. The sample of the study consists of 236 male and 264 female students of fourteen higher secondary schools. The Normative Survey Method is adopted to study the Word Fluency, a dimension of Divergent Production Ability (DPA), to measure the Word Fluency, Divergent Production Battery (DPA) constructed and standardized by Dr. Sharma K.N. (2010) and Personal Data Sheet to obtain the general information of the respondent is used. The results show that the Word Fluency, a dimension of Divergent Production Ability (DPA) score of the higher secondary students of first year is low, and there is significant mean difference between the sub-samples namely Gender, Residence, Medium of Instruction, Personal Tuition, Personal Help for Reading, Parental Education, Parental Occupation, Family Monthly Income, Number of Siblings, Order of Birth, Group chosen in the Higher Secondary Course and Nature of Institution.

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INTRODUCTION

The educational process should be aimed at developing creative abilities among children. This can be achieved by acquainting the teachers and parents with real meaning of the creative process and the ways and means of developing and nurturing Divergent Production Ability (DPA). One of the most unobvious acts of Divergent Production Ability (DPA) is the use of language. By fostering pupil's Divergent Production Ability (DPA) in the classroom, they will be helped to identify and establish a framework for their lives. Divergent Production Ability (DPA) is the ability to discover new solutions to problems or to produce new ideas, inventions or works of art. It is a special form of thinking, a way of viewing the world and interacting with it in a manner different from that of the general population. Creative process is the emergence in action of a novel relation or product, growing out of the uniqueness of the individual on the one hand, and the materials, events, people or circumstances of his life on the other. Divergent Production Ability (DPA) is the unique characteristics of the human mind may be defined as the capacity of an individual to create or produce an entirely new or novel idea or object or by the rearrangement or reshaping of what is already known. It is also characterized by qualities like universality, adventurousness and open-mindedness, a craving for change and novelty, ego involvement and divergent thinking.

According to Guilford and Torrance, Divergent Production Ability (DPA) has the following dimensions (or components)

- a. Spontaneous flexibility (ability or disposition to produce a great variety of ideas, freedom from inertia).

- b. Fluency (this aspect is quantitative in nature which is related with fertility of ideas).
- c. Sensitivity to problems (seeing defects, needs, deficiencies, seeing the odd or the unusual).
- d. Originality (calls for remote associations or relationships, remote either in time or in logical sense).
- e. Elaboration (ability to work out the details of a plan, idea or outline).
- f. Redefinition (ability to define or perceive in a way different from the usual established or intended way or uses).

Need for the study

In the present scenario adequate and proper exposure of the language is a must, so extensive reading promotes the growth of vocabulary. Divergent Production Ability (DPA) is the process of being imaginative and innovative; it is the ability to create something new that goes beyond ordinary modes of thought. Language teachers can bring forth the best creative outputs by providing interesting activities, but language teaching often fails to produce creative language users. The spoken and the written form along with its unique features viz. style, figures of speech etc. should be given special attention. Therefore there is a need to study the Word Fluency, a dimension of Divergent Production Ability (DPA) of Higher Secondary students.

Objectives of the study

The Objectives of the study are as follows

1. To study the Word Fluency, a dimension of Divergent Production Ability (DPA) of the Higher Secondary

Students.

- To find out the significant mean difference if any, in the sub-samples of Gender, Residence, Medium of Instruction, Personal Tuition, Personal Help for Reading, Parental Education, Parental Occupation, Family Monthly Income, Number of Siblings, Order of Birth, Group chosen in the Higher Secondary Course and Nature of Institution in the Word Fluency, Divergent Production Ability (DPA) of Divergent Production Ability (DPA) of Higher Secondary Students.

Hypotheses of the study

The Hypotheses of the study are as follows

- The Word Fluency score of Divergent Production Ability (DPA) of the Higher Secondary Students is not high.
- There is no significant mean difference between the sub-samples of Gender, Residence, Medium of Instruction, Personal Tuition, Personal Help for Reading, Parental Education, Parental Occupation, Family Monthly Income, Number of Siblings, Order of Birth, Group chosen in the Higher Secondary Course and Nature of Institution in the Word Fluency scores of Divergent Production Ability (DPA) of Higher Secondary Students.

Table-1 distribution of word fluency score of divergent production ability (dpa) of the higher secondary students

Variable (1)	N (2)	Mean (3)	Median (4)	Mode (5)	SD (6)
Word Fluency score of Divergent Production Ability (DPA)	500	12.22	10.00	7.00	7.94

Design of the study

This research is taken to study the Word Fluency, a dimension of Divergent Production Ability (DPA) of Higher Secondary Students. The Normative Survey Method is adopted to study the Word Fluency, a dimension of Divergent Production Ability (DPA) of Higher Secondary Students. *Word Fluency* is a vocabulary test. It is to give more words to stimulus. It is of synonyms or antonyms that are asked for.

In addition, the other variables namely, Gender, Residence, Medium of Instruction, Personal Tuition, Personal Help for Reading, Parental Education, Parental Occupation, Family Monthly Income, Number of Siblings, Order of Birth, Group chosen in the Higher Secondary Course and Nature of Institution of the respondents are also taken into account with a view to find out their effect on the Word Fluency, a dimension of Divergent Production Ability (DPA) of the Higher Secondary Students.

In order to study the Word Fluency, a dimension of Divergent Production Ability (DPA) of the Higher Secondary Students, the researcher chooses the Higher Secondary Schools in Cuddalore town as the Population. The population consists of fourteen Higher Secondary Schools, in which four are Government, three are Government Aided and seven are Private. *Stratified Random Sampling* method was adopted for choosing the sample for the present study. The strata specified were *Nature of Institution – Government - Government Aided - Private* schools. Two Government schools, three Government Aided schools and two Private schools for *Government - Government Aided - Private* strata, and hence the sample selection is made on these seven selected schools. The selected sample constitutes 50.00% (Seven schools out of fourteen schools) of the Population. *Random Sampling* method was used to select the sample from the selected

schools. There are 500 samples from the selected schools for the present study.

Tools used in the study

The tools used in the study are

To measure the Word Fluency, a dimension of Divergent Production Ability (DPA) of the Higher Secondary Students, Divergent Production Abilities Battery (DPA) Constructed and Standardized by Dr. Sharma, K.N. (2010) is used. It is a battery of tests standardized for the Children, Adolescents and Adults. The battery of Divergent Production Abilities contains six tests for measurement of the eight abilities namely, (i) Word Fluency, (ii) Ideational Fluency, (iii) Spontaneous Flexibility, (iv) Associational Fluency, (v) Expressional Fluency, (vi) Adaptive Flexibility, (vii) Originality and (viii) Elaboration. Word Fluency alone is taken care of for the present study. Word Production Test (WPT) contains five items indicating the subject to write more and more words starting or ending or both with a given letter. The items 1 and 4 require to write words starting, with 'sh' and 'tra', the item 3 requires to write words ending with 'ra', the item 2 requires the use of 'ta' at the start and end of each word, and the item 5

There is no need of common instructions to write, but for each item short instructions are sufficient to write as to what is to be done by the subject. Spaces have been provided after each item to write the words. The total number of appropriate answers to all the five items gives the '**Word Fluency Score**'.

Personal Data Sheet: In addition to the above tool, the researcher uses a Personal Data Sheet to obtain the General Information of the respondent. The general information required are Gender (Boy/Girl), Name of the Institution, Residence (Urban/Rural), Medium of Instruction (English/Tamil), Personal Tuition (Yes/No), Personal Help for Reading (Yes/No), Parental Education (Father, Mother), Parental Occupation (Father, Mother), Family Monthly Income (in Rupees), Number of Siblings, Order of Birth, Group chosen in the Higher Secondary Course (Mathematics, Physics, Chemistry and Biology (MPCB group), Mathematics, Physics, Chemistry and Computer Science (MPCCs group) and History, Economics, Commerce and Accountancy (HECA group).

Analysis and interpretation

Distribution of word fluency score of divergent production ability (dpa) of the higher secondary students

Null Hypothesis: The Word Fluency score of Divergent Production Ability (DPA) of the Higher Secondary Students is not high.

The Mean and Standard Deviation of Word Fluency score of Divergent Production Ability (DPA) of the Higher Secondary Students (N=500) is found that 12.22 and 7.94 respectively. The Median is obtained as 10.00 and there are 29 Higher Secondary Students with the same Word Fluency score of Divergent Production Ability (DPA). There are 236 Higher Secondary Students with Word Fluency score of Divergent

Production Ability (DPA) below median and 235 Higher Secondary Students with scores above median. The Mode is obtained as 7.00. The Word Fluency score of Divergent Production Ability (DPA) of the Higher Secondary Students (N= 500) is obtained in the range of 0 to 33. The obtained mean of Word Fluency score of Divergent Production Ability (DPA) (M = 12.22) of the Higher Secondary Students is below the obtained scale average (Scale average = 17.50), the null hypothesis is accepted.

95 per cent confidence that the Higher Secondary *Boys and Girls* differ significantly in their Word Fluency scores of Divergent Production Ability (DPA). The mean difference is in favour of Higher Secondary *Girls*.

The mean difference in the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students caused by the variable, *Residence* is 2.10 and the corresponding t-value 2.87 is found to be significant at 0.01 levels for 498

Table-2 Significant difference in word fluency scores of divergent production ability (dpa) for variables with two sub-samples

Variable(1)	Sub-sample(2)	N(3)	Mean(4)	SD(5)	Md.(6)	t-value(7)	Df.(8)	Level of Sig.(9)
Gender	Boys	236	9.81	5.74				
	Girls	264	14.38	8.97	4.57	6.70	498	0.01
Residence	Urban	316	12.99	7.81				
	Rural	184	10.89	8.02	2.10	2.87	498	0.01
Medium of Instruction	English	423	12.78	8.17				
	Tamil	77	9.12	5.64	3.67	3.77	498	0.01
Personal Tuition	Getting	150	13.43	8.06				
	Not Getting	350	11.70	7.85	1.73	2.24	498	0.05
Personal help for reading	Getting	128	14.38	6.89				
	Not Getting	372	11.48	8.15	2.90	3.60	498	0.01
Parental Education	Below 12 th Std.	283	11.07	7.39				
	12 th Std. and above	217	13.71	8.40	2.64	3.74	498	0.01
Parental Occupation	Government	231	13.50	8.37				
	Private	269	11.12	7.40	2.38	3.39	498	0.01
Family Monthly Income	Below Rs.8800/-	339	11.08	7.72				
	Rs. 8800.- and above	161	14.62	7.90	3.54	4.75	498	0.01
Number of Siblings	One and Only one	236	10.27	6.73				
	Above One	264	13.96	8.53	3.69	5.33	498	0.01
Order of Birth	First	363	10.79	7.04				
	Others	137	16.00	8.94	5.21	6.83	498	0.01

It is concluded that the Word Fluency score of Divergent Production Ability (DPA) of the Higher Secondary Students is low.

Significant difference in word fluency scores of divergent production ability (dpa) for variables with two sub-samples

The background variables namely Gender, Residence, Medium of Instruction, Personal Tuition, Personal Help for Reading, Parental Education, Parental Occupation, Family Monthly Income, Number of Siblings and Order of Birth are with two sub-samples and are analyzed by means of t-test.

dfs. Since the calculated t-value 2.87, is greater than the table value 2.58, the null hypothesis is rejected. It is concluded with 95 per cent confidence that the Higher Secondary Students who are *residing in Urban and Rural* differ significantly in their Word Fluency scores of Divergent Production Ability (DPA). The mean difference is in favour of Higher Secondary Students who are residing in *Urban*.

The mean difference in the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students caused by the variable, *Medium of Instruction* is 3.67 and the corresponding t-value 3.77 is found to be significant at 0.01

Table-3 Mean and standard deviation of variables with three sub-samples in word fluency scores of divergent production ability (dpa)

Variable(1)	Sub-sample(2)	N(3)	Mean(4)	S.D(5)
Group chosen in the Higher Secondary Course	MPCB	202	10.44	7.13
	MPCCs	267	12.93	8.28
	HECA	31	17.65	6.73
Nature of Institution	Government	143	13.32	9.86
	Government Aided	230	8.02	4.18
	Private	127	18.58	5.85

Null Hypothesis: There is no significant mean difference between the sub-samples of Gender, Residence, Medium of Instruction, Personal Tuition, Personal Help for Reading, Parental Education, Parental Occupation, Family Monthly Income, Number of Siblings and Order of Birth in the Word Fluency scores of Divergent Production Ability (DPA) of Higher Secondary Students.

The mean difference in the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students caused by the variable, **Gender** is 4.57 and the corresponding t-value 6.70 is found to be significant at 0.01 levels for 498 dfs. Since the calculated t-value 6.70, is greater than the table value 2.58, the null hypothesis is rejected. It is concluded with

levels for 498 dfs. Since the calculated t-value 3.77, is greater than the table value 2.58, the null hypothesis is rejected. It is concluded with 95 per cent confidence that the Higher Secondary Students who's *medium of instruction is English and Tamil* differ significantly in their Word Fluency scores of Divergent Production Ability (DPA). The mean difference is in favour of Higher Secondary Students whose medium of instruction is *English*.

The mean difference in the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students caused by the variable, *Personal Tuition* is 1.73 and the corresponding t-value 2.24 is found to be significant at 0.05 levels for 498 dfs. Since the calculated t-value 2.24, is greater

than the table value 1.96, the null hypothesis is rejected. It is concluded with 95 per cent confidence that the Higher Secondary Students who are *getting and not getting the Personal Tuition* differ significantly in their Word Fluency scores of Divergent Production Ability (DPA). The mean difference is in favour of Higher Secondary Students who are *getting Personal Tuition*.

Table-4 Significant difference in word fluency scores of divergent production ability (dpa) for variables with three sub-samples

Variable(1)	Source of variation(2)	Sum of Squares(3)	Df.(4)	Mean Sum of Square(5)	F-value(6)	Level of Sig.(7)
Group chosen in the Higher Secondary Course	Between the groups	1687.57	2	843.78	14.07	0.01
	Within the groups	29799.67	497	59.06		
	Total	314887.24	499			
Nature of Institution	Between the groups	9366.63	2	4683.31	105.22	0.01
	Within the groups	22120.61	497	44.51		
	Total	21487.24	499			

The mean difference in the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students caused by the variable, *Personal Help for Reading* is 2.90 and the corresponding t-value 3.60 is found to be significant at 0.01 levels for 498 dfs. Since the calculated t-value 3.60, is greater than the table value 2.58, the null hypothesis is rejected. It is concluded with 95 per cent confidence that the Higher Secondary Students who are *getting and not getting the Personal Help for Reading* differ significantly in their Word Fluency scores of Divergent Production Ability (DPA). The mean difference is in favour of Higher Secondary Students who are *getting Personal Help for Reading*.

The mean difference in the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students caused by the variable, *Parental Education* is 2.64 and the corresponding t-value 3.74 is found to be significant at 0.01 levels for 498 dfs. Since the calculated t-value 3.74, is greater than the table value 2.58, the null hypothesis is rejected. It is concluded with 95 per cent confidence that the Higher Secondary Students who's *Parental Education is Below 12th Standard and 12th Standard and above* differ significantly in their Word Fluency scores of Divergent Production Ability (DPA). The mean difference is in favour of Higher Secondary Students whose Parental Education is *12th Standard and Above*.

The mean difference in the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students caused by the variable, *Parental Occupation* is 2.38 and the corresponding t-value 3.39 is found to be significant at 0.01 levels for 498 dfs. Since the calculated t-value 3.39, is greater than the table value 2.58, the null hypothesis is rejected. It is concluded with 95 per cent confidence that the Higher Secondary Students who's *Parental Occupation is Government and Private* differ significantly in their Word Fluency scores of Divergent Production Ability (DPA). The mean difference is in favour of Higher Secondary Students whose Parental Occupation is *Government*.

The mean difference in the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students caused by the variable, *Family Monthly Income* is 3.54 and the corresponding t-value 4.75 is found to be significant at 0.01 levels for 498 dfs. Since the calculated t-value 4.75, is greater than the table value 2.58, the null hypothesis is rejected. It is concluded with 95 per cent confidence that the Higher Secondary Students whose *Family Monthly Income is Below Rs. 8800/- and Rs. 8800/- and above* differ significantly in

their Word Fluency scores of Divergent Production Ability (DPA). The mean difference is in favour of Higher Secondary Students whose Family Monthly Income is *Rs. 8800/- and above*.

The mean difference in the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students

caused by the variable, *Number of Siblings* is 3.69 and the corresponding t-value 5.33 is found to be significant at 0.01 levels for 498 dfs. Since the calculated t-value 5.33, is greater than the table value 2.58, the null hypothesis is rejected. It is concluded with 95 per cent confidence that the Higher Secondary Students who has *Siblings One and only one and above one* differ significantly in their Word Fluency scores of Divergent Production Ability (DPA). The mean difference is in favour of Higher Secondary Students who has *Siblings above one*.

The mean difference in the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students caused by the variable, *Order of Birth* is 5.21 and the corresponding t-value 6.83 is found to be significant at 0.01 levels for 498 dfs. Since the calculated t-value 6.83, is greater than the table value 2.58, the null hypothesis is rejected.

It is concluded with 95 per cent confidence that the Higher Secondary Students who's *Order of Birth is First and Others* differ significantly in their Word Fluency scores of Divergent Production Ability (DPA). The mean difference is in favour of Higher Secondary Students whose Order of Birth is *others*.

Significant difference in word fluency scores of divergent production ability (dpa) for variables with three sub-samples

The background variables namely Group chosen in the Higher Secondary Course and Nature of Institution are with three sub-samples and are analyzed by means of F-test.

Null Hypothesis: There is no significant mean difference between the sub-samples of Group chosen in the Higher Secondary Course and Nature of Institution in the Word Fluency score of Divergent Production Ability (DPA) of Higher Secondary Students.

The Mean and Standard Deviation of the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students of *Mathematics, Physics, Chemistry and Biology (MPCB) group* (N=202) is found to be 10.44 and 7.13 respectively. Similarly, the Mean and Standard Deviation of the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students of *Mathematics, Physics, Chemistry and Computer Science (MPCCs) group* (N=267) is found to be 12.93 and 8.28 respectively. The Mean and Standard Deviation of the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students of *History, Economics, Commerce and Accountancy*

(HECA) group (N=31) is found to be 17.65 and 6.73 respectively.

The Mean and Standard Deviation of the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students of *Government Schools* (N= 143) is found to be 13.32 and 9.86 respectively. Similarly, the Mean and Standard Deviation of the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students of *Government Aided Schools* (N=230) is found to be 8.02 and 4.18 respectively. The Mean and Standard Deviation of the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students of *Private Schools* (N= 127) is found to be 18.58 and 5.85 respectively.

There exists a mean difference in the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students in *Group chosen in Higher Secondary Course* for the respective F-value, 14.07 which is found to be significant at 0.01 levels for its (2, 497) dfs. Since the calculated F-value (14.07) is greater than the tabulated F-value (4.61) at 0.01 levels, the null hypothesis is rejected for (2, 497) dfs.

It is concluded that there is a significant mean difference in the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students in the sub-samples of *Group chosen in the Higher Secondary Course*.

There exists a mean difference in the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students in *Nature of Institution* for the respective F-value, 105.22 which is found to be significant at 0.01 levels for its (2, 497) dfs. Since the calculated F-value (105.22) is greater than the tabulated F-value (4.61) at 0.01 levels, the null hypothesis is rejected for (2, 497) dfs. It is concluded that there is a significant mean difference in the Word Fluency scores of Divergent Production Ability (DPA) of the Higher Secondary Students in the sub-samples of *Nature of Institution*.

CONCLUSIONS

1. The Word Fluency, a dimension of Divergent Production Ability (DPA) score of the Higher Secondary Students is low.
2. There is a significant mean difference between the sub-samples of Gender, Residence, Medium of Instruction, Personal Tuition, Personal Help for Reading, Parental Education, Parental Occupation, Family Monthly

Income, Number of Siblings, Order of Birth, Group chosen in the Higher Secondary Course and Nature of Institution in the Word Fluency, a dimension of the Divergent Production Ability (DPA) scores of Higher Secondary Students.

Recommendations of the study

The present study recommends for the improvement of the Word Fluency, a dimension of Divergent Production Ability (DPA) of the Higher Secondary Students.

1. The Word Fluency, a dimension of Divergent Production Ability (DPA) of the Higher Secondary Students should be improved through various programmes and workshops in order to upgrade their learning skills.
2. Curriculum Planners should provide rooms for the younger generation to develop the Word Fluency, a dimension of Divergent Production Ability (DPA) and hence in turn in their process of language learning and also in English.
3. Cultural programmes have to be conducted in order to improve their creative arts.
4. Exhibitions have to be conducted so as to improve the creative skills and debates should be organized to develop the Word Fluency, a dimension of Divergent Production Ability (DPA).

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