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A Young EFL Learner's Lexical Development through Different Input and Output Frequency Patterns

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Abstract

The present study was undertaken to investigate the effects of varying frequency patterns (FPs) of words on the productive acquisition of a young EFL learner in a home setting. Target words were presented to the learner using games and role plays. They were subsequently traced for their frequencies in input and output. Eighteen immediate tests and delayed tests were administered to measure the oral production following the treatments. To examine the efficacy of varying FPs, target words were grouped into four sets: High Input/High Output (HIHO), Low Input/Low Output (LILO), High Input/Low Output (HILO), and Low Input/High Output (LIHO). The findings revealed that the differences among the FPs were statistically significant. Meanwhile, Wilcoxon signed-rank test identified a significant discrepancy between the words with LILO and HIHO frequency patterns. The findings demonstrated that the differences in FPs led to different productive gains, and higher word production cropped up when words occurred very frequently both in input and output. This study shows that higher teacher talk in tandem with higher learner talk could boost lexical production by a young learner in meaning-focused instructions.

Keywords: EFL child learner; Frequency; Input; Output; Lexical development

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1. Introduction

1.1. Background

Earlier advocates of starting teaching a second language (L2) at a very young age justified adopting such a policy merely based on neurological evidence (Stern, 1983). Other studies (Genesee, 1978; Hatch, 1983) demonstrated that other factors, inter alia, higher input, more output opportunities, and implicit learning (Butler, 2009; Singleton, 2005) also play key roles in L2 learning. Nowadays, L2 acquisition theories (Gass, 1997; Long, 1983) as well as usage-based models (Bybee, 2010; Koirala, 2015; Wolter & Gyllstad, 2013) emphasize the role of input as a key driving force in L2 acquisition. For example, usage-based theorists argue that child-directed input contains rich statistical information which indirectly makes the generalization of the language constructions possible. Some researchers even contended that lengthened exposure to language input could result in higher fluency and efficiency when L2 learning is limited to the classroom in a foreign setting (Curtain & Dahlberg, 2010; Enever & Moon, 2009; Larson Hall, 2008). Empirical studies (e.g., Gathercole, 2002; Lieven, 2010; Paradis, 2011; Scheele, Leseman, & Mayo, 2010) have also given credence to the efficiency of input in the acquisition of language by L2 children. For instance, Scheele et al. (2010) reported that bilingual learners required more exposure to input to acquire words in a majority language.

Nevertheless, the potentials of input to account for acquisition have raised some controversies (Bohman, Bedore, Pena, Mendez-Perez & Gillam, 2010; Erlam, 2003; Swain, 1985). Nativist theories consider input to be less powerful in accounting for all the properties of language (White, 2003) and argue that input denies the negative evidence essential for the prevention of overgeneralization (Schwartz, 1999). This position was also supported by Swain (1985) whose Output Hypothesis strongly objected to the Input Theory of Krashen (1981) who strongly claimed that input data,

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once comprehended, would lead to automatic production. Instead, Swain (1985) argued that output is required for the processing of language and automatization of L2 production.

Some studies have compared the effect of output with that of input in children's L2 acquisition. For example, Bohman et al. (2010) found that children's output was more influential for L2 morphosyntactic development than input. Their findings implied that production accounted for the accuracy and automaticity of morphosyntactic constructions. Similarly, Paradis's (2011) findings showed that output in comparison to input was a stronger predictor of L2 vocabulary/morphology acquisition As established by some studies, closed-class words including pronouns, determiners, conjunctions, and prepositions were reported not to be sensitive to input effect for both first language (L1) and L2 acquisition (Crossley, Salsbury, Titaki & MacNamara, 2014; Goodman, Dale & Li, 2008).

Despite the above-posed arguments, it is evident that both input and output data contribute to the efficient acquisition of a language. However, the amount of the contribution of each type of data for the efficient L2 learning has not been sought for in many studies. To pursue this goal, *frequency* as one of the main features of both input and output, was used in the current study. It was hypothesized that different frequency patterns of linguistic elements in input and output may lead to different word productions by an English as a foreign language (EFL) young learner in a home learning context. The next two sections elaborate on the frequency in brief and review some studies concerning frequency and language acquisition.

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1.1. Frequency and language learning

Frequency is defined by Crossley et al. (2014, p. 302) as "the raw occurrence of linguistic items in the absence of context", that is the raw token counts of the constructions of different sizes. It is posited that linguistic features are processed and produced with much facility when the learners hear, read, or use them with higher frequency (Mintz, Newport & Bever, 2002). A learner may learn a word from single exposure as a function of fast mapping, but learning is susceptible to decay in fast mappings (Ellis, 2005). Consistent and multiple exposures to the same form in various exemplars help its elaboration and full representation in the language system (Carey & Bartlett, 1978). According to Ellis (2007), recurrent use consolidates the construction trace in memory and primes its subsequent use when needed. Studies have come up with some evidence for the sensitivity of L1 acquisition to frequency at such different aspects as lexical acquisition (Pellicer-Sánchez & Schmitt, 2010; Pigada & Schmitt, 2006; Wang & Koda, 2005), rule learning (Wolter & Gyllstad, 2013; Wulff, Ellis, Römer, Bardovi-Harlig & LeBlanc, 2009), and comprehension and production processing (McDonough & Mackey, 2008; Pellicer-Sánchez, 2015). However, further studies are warranted to establish its efficacy in L2 learning (Larsen- Freeman & Long, 1991; R. Ellis, 1994; Wolter & Gyllstad, 2013). Some inadequate evidence demonstrates the favorable role frequency plays in the L2 learning, but causal evidence is scant (Mackay & Gass, 2002). Researchers postulate that frequency plays some part in the acquisition of L2 system, but its efficacy may be modulated by some accompanying elements like age, L1 background, individual differences, working memory capacity, as well as learning strategies (Mackay & Gass, 2002; Wolter & Gyllstand, 2013). Given the research goal, the following section briefly touches on the role frequency plays in lexical acquisition.

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1.2. Frequency and lexical acquisition

Empirical studies corroborate the relationship between frequency and lexical acquisition in L1 and L2. Some findings show that frequency affects the type of lexical categories children learn (i.e., whether they have more knowledge of nouns or verbs relies heavily on the frequency effect). For example, American children have considerable proportion of nouns in their early language development (Gentner, 1982), while Korean and Chinese children know a large number of verbs which highly correlate with their parental input (Goodman, Dale, & Li, 2008). Network Model of Bybee (2010) posits that the processing load of a lexical item decreases with an increase in the lexical strength. Lexical strength is measured on a processing basis which is sensitive to token frequency. High token frequency adds to the strength of any word or morpheme and leaves a trace in the lexicon which, in turn, facilitates the retrieval of the target word. It is even assumed that every inflectional form of a word is stored separately in the lexicon as distinct entry. For example, *worked* and *working* are separate entries with respective processing load of their own. Their strength depends on the exposure rate. In effect, the more frequently these items are met in input, the faster they will be processed and consequently they will be less prone to error (Blom et al., 2012). Recent studies have provided substantial evidence in terms of the efficacy of frequency in L2 lexical acquisition. A research was conducted by Koirala (2015) who asked 217 English learners of native Spanish and Portuguese to determine the perceived difficulty of some words belonging to different frequency ranges (1 to 5, 5 to 50, 50 to 500, and 500 to 5000). The results from three-point difficulty scale showed a negative correlation between perceived word difficulty and frequency. To put it differently, as the rate of the word frequency increased, their perceived difficulty was found to be reduced for ESL students. Similarly, Chen and Truscott (2010) examined the effect of frequency intervals on different aspects of word knowledge. Meanwhile, the researchers investigated if L1

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lexicalization has any impact on word meaning. The findings showed that repetition eased the acquisition of lexical items, and that grammatical function was retained better than receptive knowledge after two weeks in the delayed posttest. The study further found that, to learn the meaning, 3 to 7 encounters were needed and that L2 words with no lexicalized counterparts in L1 were more difficult to learn and needed at least 7 exposures to be acquired. A newest evidence was found by Sunama (2018) who examined the effect of frequency of occurrence through reading (1, 3, 7 exposures) on the acquisition of six aspects of L2 word knowledge, such as receptive knowledge of spelling (RS), productive knowledge of spelling (PS), receptive knowledge of parts of speech (RP), productive knowledge of parts of speech (PP), receptive knowledge of meaning (RM), and receptive knowledge of association (RA). The participants were sixty 16-year-old Indian learners of English who learned English as a second language. Immediate posttest showed that seven exposures led to more significant learning on PS, RS, RM, and RA than only one or three exposures.

Children's sensitivity of lexical acquisition to frequency has also been reported in the literature. Brent and Siskind (2001) found that infants between 9 and 15 months old produced many words which correlated highly with those their mothers frequently produced in interaction with them. Schwartz and Terrell (1983) similarly found that one-year-old children learned more frequent words more easily than less frequent ones. Meanwhile, Labov, Rosenfelder, and Fruehwald (2013) reported that higher type frequency of patterns like "blow/blew, know/knew, grow/grew, throw/threw" prevented the child to say "play/pled*" or "obey/obed*" on the single case of "say/said".

Nevertheless, not all word categories are susceptible to frequency effect. As a case in point, despite their higher frequencies in caretaker speech, closed-class words are acquired late, and seldom do learners use them in interaction (Goodman et al., 2008). Further evidence came from a

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year-long program of Crossley et al. (2014) examining the spoken data from interactions between six ESL learners and thirteen native speakers of English. The analysis of the frequency values from input and output showed that L2 learners did not produce target words like articles, perfect auxiliaries, question words, complementizers, and possessive pronouns in the same rate as their native interlocutors as they were phonologically less salient but functionally more complicated.

1.4. The present study

This study investigated the effect of input/output frequency patterns (i.e., the number of times the learner hears or produces the same lexical items) on the word production by an EFL young learner. Output frequency added a new dimension to the frequency investigation as it had been less probed by L2 researchers than input frequency. Meanwhile, the current study examined EFL learning in a home setting which is very rare compared to naturalistic and instructed learning. With this in mind, the researchers formulated the following four questions in the present study:

1. Are words with various frequency patterns (FPs) in input and output produced differently by a young EFL learner?
2. What is an efficient FP for a young EFL learner's word production?
3. Is young EFL learner's acquisition of closed-class words sensitive to FPs at a home setting?
4. Does home instruction result in efficient production of words by a young EFL learner?

2. Method

2.1. Setting and participant

A six-year-old female learner participated in the study. Rony (a pseudonym) was born in 2010, in Zanjan, a bilingual province in Iran. Mostly, children

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in Zanjan speak two languages (Turkish-Persian) and often code-switch in the conversations with the adults and their peers. There is no officially accepted English pedagogy for preschoolers at her age in Iran, and parents usually seek English pedagogy in the privately run institutions or pre-primary schools. Being aware of the low effectiveness of English instruction in such settings, the first researcher (the child's parent and her instructor) was inspired to present Rony with systematic English instructions in home context. The case study continued for 11 months from June 2016 to May 2017.

2.2. Design

Frequency Patterns (FP) of target words constituted the *independent variable (IV)*. Productive acquisition of words by young learners constituted *dependent variable (DV).* Occurring at different rates in input and output, new words led to the construction of different frequency patterns. The case learner was exposed solely to instructor language which formed *input* in the study, and the learner's responses and uptake moves ensuing instructor's implicit corrective feedbacks constituted *output*. There was no purposive control on the number of the occurrence of target words, and what came up as FP was a natural process of word occurrence in input and output. Meanwhile, no particular control was exercised on word selection in terms of various aspects of vocabulary knowledge like form, meaning, and function. The following FPs explored from the data formed different levels of IV:

HIHO: *(H=high, I=input, O=output)* denotes words with high frequencies in both input and output.

HILO: *(L=low)* denotes words with high frequencies in input, but low frequencies in output.

LIHO: indicates words with low frequencies in input, but high frequencies in output.

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LILO*:* indicates words with low frequencies in both input and output.

2.3. Materials and target words

Due to the age of the participant, "here and now" tasks were planned based on themes like supermarket, restaurant, doctor's office, cloth store, toy shop, etc. Different materials were utilized in the plays, depending on the themes. For example, in the 'restaurant play', you could find toy plastic spoons, forks, plates, tea cups, coffee cups, etc. The tasks were categorized into focused tasks, listen-and-do tasks, question techniques, and interactive tasks (Ellis, 2012; Ellis, 2003; Lyster, 2007; Skehan, 2001). For example, questioning techniques were often used in the language events portrayed in excerpts 1 and *2*. Here, the learner had to draw some pictures in the play to depict what the parent was talking about. Moreover, the learner kept a portfolio of her drawings which she later used to describe the events, the objects, and the people in them. For example, in a prelude to a game, the instructor asked the learner to draw some pictures in order to use them in teaching interrogation in present progress *'Is/Are NP(s) V+ing?'* :

Excerpt 1
I (Instructor): Hanita is fighting a dragon. Draw, hurry up
R (Rony): Dragon!
I: Yeah, ezhdeha (dragon in Persian)
R: … (drawing)
I: Cow is eating grass. It is eating grass now.

Next, the instructor had to ask questions about the pictures and then let her determine forthwith the truth by saying Yes/No. They took turns in playing such games. The following excerpt exemplifies this:

Excerpt 2
I: Is the cow eating seed?

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R: No
I: Are the ants taking bones?
R: No
I: Is the dog eating bone?
R: Yes

In another game, to present locative constructions *(It is under/on NP?),* interrogative locative constructions *(Is it under/on NP?, where is NP?)* and some target words, the instructor and/or Rony were to hide an object somewhere and ask questions about their place while they were looking for the object.

Excerpt 3
I: Where is the pencil?
R: ah, under the sofa? (*while she is looking for the object*)
I: No,
R: Under the table?
I: Come on, no
R: It is under the …..under the ….boshgab. ('*boshgab'* means *plate*)
I: Plate? No, No
R: It is …? It is ….?
I: Is it…?

Each instruction period occurred between 10 and 18 sessions with the aim of having target lexical items and constructions reiterated in the learner and instructor's language. Each session lasted around 20 or 25 minutes, where the focus was on the meaning and outcome of the games, there were implicit corrective feedback instances in the form of recasts and elicitation (Spada, 2014). Consulting the available animated instructional films and books (Peppa Pig cartoons, Let's go, Magic English, Opposites and More, Tiny Talk, Wizadora, to name a few), the instructor interspersed such different lexical categories as nouns, verbs, adverbs, adjectives,

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prepositions, pronouns, conjunctions, determiners, and articles into the tailored instructional package (see Table 1). To begin with, the instructor provided a list of words from the proper sources and then categorized them based on their parts of speech. Then, from among each word class, he randomly selected some for the instruction.

2.4. Data collection and Measurement

Instruction sessions as well as measurement sessions were audio recorded by a high tech recording device and then were transcribed by the first researcher into *instruction corpora* and *measurement Corpora*. With the culmination of each instruction period, immediate tests were executed with one-week intervals, followed by delayed tests administered with two-week intervals. No pretests were administered to the learner as she was an absolute beginner and had no command of the target words and constructions introduced in the games. To prevent history effect, extraneous factors, such as English media, cartoons, and games in English were controlled during the 11-month treatment sessions. The instructor made use of similar games, play contexts, and picture descriptions to elicit the target lexical items during the measurement. In effect, similar contexts played priming and prompting roles for the learner to remind her of the relevant language events and target words. As with measuring syntactic constructions, where some contexts made the use of certain syntactic patterns obligatory for the learner (see Rahimi, Gholami, & Mohammadnia, 2019), contexts were constructed eliciting and activating the production of certain target words including verbs, articles, adverbs, adjectives, and conjunctions. In measuring the production of some words and constructions, Rony's own drawings were also used, the ones she had made during some instruction sessions and kept as portfolios. She had to describe the events, objects, and people in the picture. In a sample picture description on which the child's ability to accurately produce progressive construction of ' Pro/N

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are/is V+ing', and words like *eat, cow, fight, seed,* etc. was going to be tested, she described the events as follows:

Excerpt 4

R: *Ant eating seed.
-: Hanita is going up the ladder.
-: I am fighting dragon
-: *They going to school.
-: *Cow eating grass.

And in order to measure the production gain of the words like *dog, laugh, bone,* etc. in the construction *'Is/Are NP(s) V+ing?'*, the learner was asked to initiate the game by asking some questions from the instructor while pointing to the pictures:

Excerpt 5

R : *ant is jumping?
I: No
R: * Cow fighting Kiaram?
I : Yes
R: *dog is eating …eating…? in chee mishe? (*what is it?)*
I: bone … ?
R: *Do you laughing?

Each measurement session lasted between 15 and 25 minutes, depending on the number of the target items to be tested. From June 2016 to May 2017, 18 tests (9 immediate tests and 9 delayed tests) were administered to Rony. In measurement, each target word had almost equal chance to be measured in terms of production unless test task was not transparent, and the instructor had to give extra chances in order to elicit target word(s) from the learner.

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2.5. Scoring

The percentage of correct use of lexical and functional words in obligatory context and non-obligatory context was calculated (Pica, 1983) using the formula $\frac{UOC}{OC+ UNOC}$, where UOC denotes the number of times the learner supplies target item, OC signifies the number of obligatory contexts, and UNOC stands for the number of non-obligatory contexts, where the learner performed incorrectly. Although this formula worked better with functional words like articles and prepositions than content words, the researchers decided to follow similar procedure in scoring in order to gather uniform results.

2.6. Data analysis

Following the transcription of instruction sessions, input and output texts were separated in order to identify the trained words in both sets of texts. Later on, the words were computed for their frequencies of occurrence in input and output data for the follow-up analysis. Reliability of the coding was determined for the instructional texts by having an experienced teacher re-transcribe one third of the data. The analysis of the inter-coder reliability found Kappa agreements of 0.91 ($p < .0.000$) and 0.88 ($p < .0.000$) for the input and output data, respectively. The first researcher scored the target words in measurement texts in which the percentage of the time a learner was able to provide the target word in the obligatory context was sought and calculated. Consistency in scoring the production performance was also calculated by getting a PhD. candidate to rescore three immediate tests out of nine immediate tests by adhering to the agreed-upon scoring procedures. Computation showed a Kappa agreement of 0.63 ($p < .0.000$) which is considered to be a substantial agreement in the raters' coding. Furthermore, in order to provide further data for consistency in measurement, the researchers decided to calculate test-retest reliability. They used Spearman

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rank-order correlation and came up with the correlation coefficient of 0.90 (p= .001).

The number of target words which were tracked down and computed was 258. Table 1 presents lexical categories, respective examples, and the number of the words traced for their rates of occurrence.

Table 1. *Target Lexical Categories under Analyses in the Instruction and Measurement Sessions*

Lexical Categories	**Number**	**Examples**
Nouns	154	*Pen, cat, bridge*
Verbs	58	*Yell, help, put on*
Adverbs	5	*Tomorrow, early*
Adjectives	16	*Fatter, large, dark*
Prepositions	9	*In, up, from*
Pronouns	7	*Me, your, yourself*
Conjunctions	2	*And, or*
Aux./Modals	5	*Did, do, can*
Determiners	1	*The*
Interrog. Word	1	*Whose*
Total	**258**	

To examine the questions formulated in the paper, the researchers categorized 258 words into Frequency Patterns (FP), namely *High Input/High Output (HIHO), High Input /low Output (HILO), Low Input/High Output (LIHO),* and *Low Input/low Output (LILO)*. Friedman test as a non-parametric procedure and Wilcoxon Signed Ranks test were

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used to analyze the data concerning the frequency patterns. The result section elaborates on the way the FPs were demarcated and analyzed.

3. Results

In order to investigate the effects of varying FPs on the word production of a preschooler at home setting, high and low frequencies were determined in input and output data. To this end, gross median frequency score was utilized to prevent the negative effect of extreme frequency scores in both data sets. This resulted in the exploration of four types of FPs including *HIHO*, *HILO*, *LIHO* and *LILO*. Table 2 displays the median frequency scores for the words appearing in input and output, the number of words suited in each FP, and the maximum and minimum frequency scores for input and output.

Table 2. FPs and the Number of Words in Each Type

Data	Gross Median Frequency Scores	Max-Min Frequency Score	No of FP1 HIHO	No of FP2 HILO	No of FP3 LIHO	No of FP4 LILO
Input	43	*Max= 335* *Min=1*	82	39	40	86
Output	9	*Max= 92* *Min= 1*				

Max: Maximum, Min: Minimum, No: Number

As the table depicts, median frequency scores in input and output data were set at 43 (Median=43) and 9 (Median=9), respectively for lexical items. The words occurring above the score of 43 in input and above the score of 9 in output were considered as HIHO items, and the words appearing below the respective frequency scores were taken as LILO words. Moreover, the words lying above median frequency score of 43 in input and below the score of 9 in output went under HILO category. LIHO words

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were those which occurred lower than the score of 43 in input, but higher than the score of 9 in output data.

To account for both short and long term lexical production gains, *Total Scores*, which were the average scores from immediate and delayed tests, were used instead of opting for immediate or delayed test scores. Tables 3 and 4 show the target words along with their total and frequency scores in input and output data. Table 3 tabulates the data from the words with LILO and HIHO frequency patterns:

Table 3. *Words with LILO and HIHO Frequency Patterns*

***LILO* Words (N=86)**				***HIHO Words (N=82)***			
Words	**Total Scores**	**IF**	**OF**	**Words**	**Total Scores**	**IF**	**OF**
Tie	0	42	7	*The (N)*	92	335	88
Crawl	100	42	7	*Under*	16	265	29
Make food	100	41	7	*And*	100	259	92
Work	0	40	5	*eat*	40	221	33
Wash	0	40	5	*Dragon*	25	152	54
Ear drop	0	39	6	*yourself*	0	149	27
Door	100	38	4	*Rubber*	80	141	72
Sun	100	38	8	*tomorrow*	40	136	34
Bigger	100	38	14	*me*	90	129	62
Wedding	85	37	0	*Fight*	33	129	22
Make snowman	100	37	4	*Tree*	100	127	17
Lift	0	37	5	*Cloud*	71	113	23
Happier	100	37	8	*Yesterday*	100	111	31
Ogre	0	36	3	*Snake*	66	109	19
Roar	80	36	1	*Chick*	100	109	11
Or	100	36	5	*Key*	80	107	30
Train	66	34	6	*Scarf*	50	105	25
go to the wedding	87	34	5	*Mirror*	1	100	20

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Softer	66	34	8	*Fruits*	50	97	24
Turn off	0	32	4	*Jacket*	50	94	33
handkerchief	0	30	5	*Teacher*	66	93	23
get up	0	30	5	*Underwear*	50	91	25
Thinner	100	30	6	*Vase*	0	91	24
grand father	0	29	6	*Sweater*	0	89	14
Call	0	29	0	*Flower*	100	89	13
Comb	20	28	6	*Cup*	100	86	20
Gift	0	28	7	*Salt shaker*	50	86	21
Cloth	0	27	9	*Earrings*	100	82	13
Higher	25	27	6	*To*	37	81	43
Wall	100	27	5	*Go up*	100	80	25
Vacuum Cleaner	0	25	5	*Chair*	0	79	14
Take (carry)	0	25	1	*More beautiful*	100	79	20
homework	0	25	5	*t-shirt*	100	78	29
Story book	0	25	6	*Trousers*	42	78	16
Bone	100	24	3	*Boots*	25	78	17
Polish	0	23	6	*Belt*	50	76	13
Dark	0	23	4	*Dresser*	0	76	14
get out of	0	23	6	*Spoon*	66	75	35
Doll	50	22	4	*Bird*	100	74	11
Sweeper	0	22	5	*Frog*	100	73	12
grand mother	0	22	7	*Girl*	100	72	34
Vacuum (v)	0	22	3	*Turn on*	0	72	19
Office	100	22	6	*Play*	0	71	12
sore feet	0	21	0	*House*	100	69	20
eye drop	0	21	0	*Mountain*	80	69	15
Gloves	75	21	5	*Pitcher*	0	69	15
Yell	0	21	7	*Alone*	100	69	34
Toothache	0	20	0	*Earache*	100	68	12
Desk	0	20	4	*Keyboard*	100	68	14
Carpet	0	20	6	*We*	0	68	72
Sore hand	0	19	0	*Pencil*	80	68	22

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Giraffe	100	19	6	*Gown*	100	64	22
Shovel	0	19	2	*With*	0	64	20
Do the fire Works	0	19	5	*Slippers*	100	63	38
Help	0	18	3	*wristwatch*	0	63	15
Break	0	18	6	*Body*	0	61	13
Date	100	17	8	*Butter*	50	61	24
Invite	0	17	4	*Fork*	50	59	25
Pants	0	16	5	*Balloon*	0	58	13
Back	100	15	3	*Jam*	0	58	19
Purse	0	15	3	*Marker*	0	58	25
Chocolate milk	100	15	9	*Necklace*	0	58	16
Travel	0	15	6	*Knife*	100	57	20
Feet	0	14	1	*Egg*	100	57	22
Weight	0	14	3	*Ruler*	0	57	23
Tail	50	13	2	*Friend*	100	57	19
Bite	0	13	0	*Wallet*	0	56	18
Garlic	0	10	3	*Light*	100	54	15
Onion	100	10	8	*Railroad*	100	53	10
Children	33	10	0	*Chocolate cream*	100	53	16
Watch	0	10	6	*Wear*	40	52	14
Leaf	0	9	1	*eyeglasses*	33	50	34
City	100	9	8	*Honey*	100	50	23
Oven	0	9	6	*Cheese*	100	50	18
sore knee	0	8	0	*Bed*	0	50	15
Harder	0	8	3	*Shark*	100	49	14
Brother	50	7	7	*Taller*	37	48	21
Sea	100	7	2	*Match*	66	47	21
Math	0	6	3	*Soap*	0	47	16
plant (v)	0	6	1	*Egg*	100	47	22
Backache	50	5	1	*Buy*	0	45	17
potato	40	5	5	*Fatter*	100	44	20
nose drop	0	3	0				
Bleat	0	3	0				
at night	0	2	0				
Foot	0	1	0				

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IF: Input frequency, OF: Output Frequency

Table 4 presents the data from the words with HILO and LIHO frequency patterns.

Table 4. *Words with HILO and LIHO Frequency Patterns*

***HILO* Words (N=39)**				***LIHO* Words (N= 40)**			
Words	**Total Scores**	**IF**	**OF**	***Words***	**Total Scores**	**IF**	**OF**
Sore	0	184	1	*Pen*	70	22	66
My	0	134	4	*airplane*	0	36	28
Her	0	115	7	*candy*	0	36	28
Leaves	100	101	6	*iron*	80	32	22
Him	0	98	6	*tomato*	62	39	22
Whose	78	93	1	*fridge*	100	35	21
Your	33	87	1	*plate*	100	22	20
Behind	0	85	1	*eye shadow*	25	40	19
Speak	0	85	5	*cat*	80	26	19
Ride	85	83	1	*pistachio*	100	14	18
Bracelet	0	83	3	*Sharpener*	100	34	17
Ant	0	73	4	*soda*	33	40	16
Pill	50	72	8	*Candle*	100	40	16
Wing	100	67	0	*Fly (trans.)*	0	25	16
Take a shower	100	67	2	*comb*	100	35	14
Shower	100	67	2	*door*	100	38	14
Drop	0	63	6	*Nail clipper*	0	31	14
Exercise	50	60	7	*Put on*	100	17	14
Roof	100	60	5	*bigger*	100	38	14
In the morning	0	59	6	*teach*	50	13	14
Window	40	58	2	*read*	100	34	14
Operation	100	76	2	*umbrella*	50	40	12
Prayers	100	76	2	*Large*	33	10	12
Party	100	55	7	*new*	0	28	12
Write	0	55	7	*change*	0	36	12
Say prayers	100	55	3	*scissors*	100	35	11
Walk	0	54	3	*Honey bee*	100	31	11

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Hit	0	51	7	*wash*	0	29	11
Go to the party	100	50	7	*from*	0	27	11
Run	0	49	4	*Make tea*	100	42	11
Fly (intrans.)	0	49	1	*hat*	0	19	10
Leg	0	48	3	*backpack*	100	12	10
Sore eyes	0	46	1	*picture*	0	24	10
Watch	33	46	6	*clean*	0	26	10
Scarves	0	46	8	*Take*	0	21	10
Longer	0	46	7	*Say hello*	33	21	10
Sore finger	0	45	1	*Snow man*	100	35	10
Branch	0	45	6	*ring*	80	28	10
School	60	43	4	*Toothpaste*	80	30	10
				Glue	75	21	10

Friedman test was utilized to respond to the research question "*Are words with various frequency patterns (FPs) in input and output produced differently by a young EFL learner?"*. Table 5 displays the number of the items for each FP, the median test scores, degree of freedom, chi-Square value, and p-value.

Table 5. *One-Way Analysis of Variance of Four Lexical Frequency Patterns*

Frequency Pattern	**N**	**Median**	**df**	χ^2	**Sig.**
HIHI	82	66%	3	8.629	.035
HILO	39	33%			
LIHO	40	70%			
LILO	86	0%			

∗ *Alpha= p< .05*

Significant differences were found (χ^2 =8.629, p = 0.035) in the production gains of the four groups of lexical items, namely HIHI (N=82, Median=66%), HILO (N=39, Median= 33%), LIHO (N=40, Median=70%), LILO (N=86, median= 0%) implying that words with various FPs had

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different productive gains. In other words, FP affected the productive acquisition of words for an early EFL learner in the home setting.

To explore *an efficient* FP *for the young EFL learner's word production*, a post hoc comparison was run using Wilcoxon Signed Ranks Test. Six independent comparisons were conducted to see the significant effect at the p< .05 level. However, because of the multiple comparisons, the Bonferroni correction was applied, and the level of significance was adjusted to p <. 008. Table 6 shows the number of the pairs of FPs compared with their relevant p-values.

Table 6. *Multiple Comparisons of Pairs of FPs with Wilcoxon Signed-Rank Test*

Pairs	**LILO - HIHO**	**HILO - HIHO**	**LIHO - HIHO**	**LIHO - HILO**	**HILO - LILO**	**LIHO - LILO**
Z	-3.561	-1.802	-.718	-1.554	-.244	-1.658
Sig.	.000	.072	.473	.120	.807	.097

∗ *Adjusted alpha = p <. .008*

As the results indicate, a significant difference only lied between the words with LILO and HIHO frequency patterns. That is, lexical items with the input frequency at or above 43 and output frequency at or above 9 resulted in higher production performance by the learner compared to the words with input frequency and output frequency below the respective input and output rates. Other group comparisons did not show any significant discrepancies among them. Comparisons such as HILO-LILO (z=-.244, p= 0.807), LIHO – LILO (z=-1.658, p= 0.097) and LIHO-HILO (z= -1.554, p= 0.120) indicated that differences in production performance were not statistically significant unless lexical categories enjoyed high frequencies in

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input and output in the conversation between the home learner and the instructor. Accordingly, comparisons of the FPs identified HIHO frequency distribution as an efficient FP in boosting word production by a young EFL learner.

Then, the question *"Is young EFL learner's acquisition of closed-class words sensitive to FPs in a home setting?"* was examined. To respond to this question, closed-class (CC) words including pronouns, determiners, conjunctions, auxiliaries, and prepositions were extracted from the four categories of FPs in tables 3 and 4. LIHO and LILO word sets were excluded from the analyses as only one instance of CC word "*from"* was explored from LIHO data and similarly the single case of conjunction word "*or"* was identified in the LILO data. Therefore, CC words from HIHO and HILO frequency patterns were only used for comparisons and inspection as shown below:

Table 7. *Comparison of Closed-Class (CC) Words form HIHO and HILO Frequency Patterns*

	CC Words with HIHO (n=9)				**CC Words with HILO (n=7)**		
Words	**Total Score %**	**IF**	**OF**	**Words**	**Total Score %**	**IF**	**OF**
The	92	335	88	*My*	0	134	4
Under	16	265	29	*Her*	0	115	7
And	100	259	92	*Him*	0	98	6
Yourself	0	149	27	*Whose*	78	93	1
Me	90	129	62	*Your*	33	87	1
To	37	81	43	*Behind*	0	85	1
More	100	79	20	*In*	0	59	6
We	0	68	72				
With	0	64	20				

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A comparison of the descriptive statistics for CC words with HIHI (Mean= 48.33, SD= 46.31) and those with HILO (Mean= 15.85, SD= 30.03) showed that CC words are sensitive to FPs. In other words, the higher usage of these words by the instructor in his input and their higher production by the learner in the output resulted in their efficient production. The findings revealed that mere higher occurrence of CC words in input addressed to the young EFL learner did not facilitate the productive performance of the same words.

The last question *"Does home instruction result in efficient production of words by an EFL young learner"* was scrutinized by gathering and describing data from the productive acquisition of words at different instructional periods. The percentage of productive acquisition from various periods was obtained and averaged to see if the instruction was efficient. Table 8 presents descriptive statistics for each instruction period. It sets out the number of the trained words in each period, averaged scores from immediate tests and delayed tests, total averaged sores, and the date of their administration.

Table 8. *Data Concerning Each Period of Instruction*

Tests	**No. of Words**	**Imtest. Scores (%)**	**Deltest. Scores (%)**	**Total Scores (%)**	**Average Input F**	**Average Output F**
T1 (Jun 15/Jun 26)	24	26.3	40.9	33.8	72	11
T2 (July 4/July 19)	20	75.0	60.0	62.4	48	18
T3 (Aug 7/Aug21)	35	53.5	47.0	50.2	56	12
T4 (Sep4/Sep19)	40	54.6	59.6	56.3	58	24
T5 (Oct2/Oct18)	28	37.6	33.3	34.1	55	9
T6 (Nov7/Nov21)	12	75.0	70.8	74.0	41	3
T7 (Dec25/Jan14)	44	41.1	42.7	42.9	53	11
T8 (Feb22/Apr8)	40	20.8	25.0	21.7	39	40
T9 (May5/May20)	15	68.8	67.2	68.4	34	11
	n=258			**M= 49.31**	**M**=50.55	**M**= 15.44

Imtest: immediate test, Deltest: delayed test, F: frequency

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Considering the above data collected at regular intervals from the lexical acquisition of the child, we found that, on average, EFL instruction at home setting enabled the learner to produce 258 target words accurately almost half of the time (M= 49.31%). Figure 1 depicts the percentage of the lexical production gained by the learner in each instruction program.

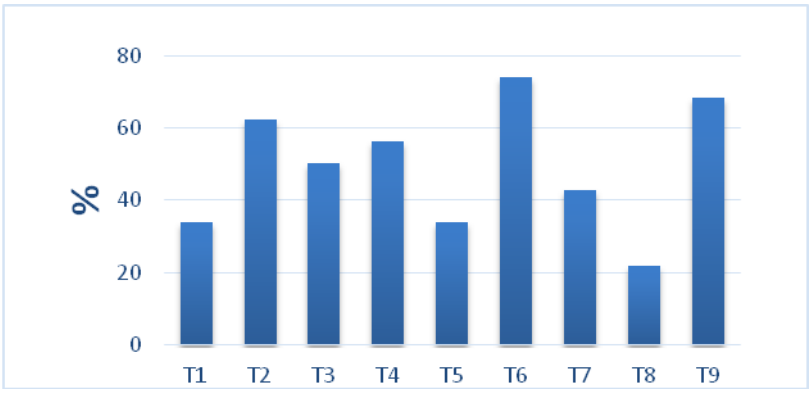


Figure 1. Word Production Gains at Nine Instruction Periods

The present study demonstrated that in a L2 learning setting where the words occur with the mean frequency of 50 (Mean=50.55) in input and with the mean frequency of 15 (Mean=15.44) in output it can lead to the successful productive performance fifty percent of the time.

4. Discussion

This case study focused on the English language development of a young EFL learner in a home setting and aimed at looking into the effects of varying FPs on the word production, coming up with an efficient FP for lexical acquisition, probing into the possible sensitivity of CC words to FP, and examining the efficiency of the instruction in a home setting. To

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respond to the questions, a participant was presented with a year-long program in which the target words were instructed by means of language-based games. The tasks were repeated in succeeding sessions to allow the reoccurrence of the target words. Each program was followed by an immediate test and a delayed test. With the completion of the programs, the target instructed words were categorized into four types of FP, depending on the occurrence of words in the input and output. Four sets of data resulting from the grouping of the trained words were HIHO, LILO, HILO, and LIHO. To enquire into the hypothesized effects on productive word acquisition of varying FPs, non-parametric analytic procedures were utilized. The findings showed that the differences were statistically meaningful, and varying FPs had differential effects in terms of production performance by the young learner. Furthermore, post hoc test located the significant difference only between HIHO and LILO frequency patterns. The results revealed that HIHO frequency pattern was more efficient in terms of word production. Production gains were outstanding at times when the instructor recurrently used the items in interaction (frequency of occurrence between 43 and 335) and when he gave the learner increased opportunities to produce the same target words (frequency scores between 9 and 92). For instance, words like *the* (335/88), *and* (259/92), *dragon* (152/54), *rubber* (141/72) and *tomorrow* (136/34) with higher input/output frequencies in instruction sessions respectively had also higher chances of occurrence in the learner' test tasks, while the words such as *wash* (40/5), *call* (29/1), *gift* (28/7) and *help* (18/3) which ranked low in terms of both input/output frequencies had lower chances of occurrence in the measurement sessions. Furthermore, the findings revealed that mere higher input could not ensure better lexical production as compared to the condition where words enjoyed both higher input and output frequencies. For example, lexical words, such as *speak* (85/5) and *ride* (83/1) with higher rates of occurrence in input and lower frequencies in output seldom led to the efficient production of lexical items in contrast to the words which

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repeatedly emerged in input and output. This was also true with CC words. It was revealed that CC words with higher rates of occurrence in both instructor's language and learner's language were performed better than the ones which enjoyed higher frequencies in input, but suffered low frequencies in output. Pronouns like *yourself* (149/27) and *me* (129/62), proposition like *under* (265/29), and definite article *the* (335/88) with higher frequencies in input/output respectively were performed more efficiently than such pronouns as *my* (134/4), *her* (115/7) and *him* (98/6) and prepositions like *behind* (85/1) and *in* (59/6) with higher rates of occurrence in input, but low frequencies in output.

As regards the impact on the lexical acquisition of various FPs, the current study provides credence to a recent research by Sunama (2018) who found that frequency impacted the acquisition of different aspects of word knowledge including productive knowledge of spelling and parts of speech. It also confirmed the findings by Pellicer-Sanchez and Schmidt (2010) whose study demonstrated that with an increase in the frequency bandings of the words, the learning gains went up. Our study provided further evidence to the findings by Pellicer-Sanchez (2015) who claimed that his L2 learners required higher exposures to be able to produce unknown words and that eight exposures only led to the recall of 55% of the meaning of unfamiliar words. Our findings were also consistent with the findings of Barrett, Harris, and Chasin (1991) whose research showed that the frequency and pattern of the production of words by children were more similar to those their mothers used in interactions with them. In terms of the acquisition of CC words, our results were not in contrast with the findings reported by L1 and L2 researchers (Goodman et al., 2008; Crossley et al., 2014) who had already reported slower acquisition of words like articles, perfect auxiliaries, question words, complementizers, and possessive pronouns despite their mounting rates of repetition in input. In line with these findings, our study showed that mere exposure to high input cannot

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guarantee the acquisition of CC words and that high input by the teacher needs to be coupled with the learner's high output in order to be acquired.

The present findings were also in harmony with the results from interactional modifications (e.g., de la Fuente, 2002; Ellis & He, 1999; McDonough, 2005; Suzuki, 2007) which are deemed to predict the productive acquisition of many language items. Evidence from such studies suggested that togetherness of input and output particularly in dialogic interactions boosted productive vocabulary knowledge. When receivers of the recasts were given opportunities for repairs and uptakes, it led to the acquisition of target forms. Furthermore, the current research corroborates the findings which highlighted the importance of output in L2 acquisition. For example, evidence from our study was consonant with the findings by Paradis (2011) who demonstrated that children's output accounted for much of the L2 vocabulary/morphology acquisition. The study also substantiated the results by Van Gelderen, Snellings, and De Glopper (2004) whose study concluded that learners' practicing with oral production during training increased word retrieval.

Additionally, the findings, here, accorded with the views held by Bargh and Pietromonaco (1982) and de Bot (1996). They argued that the frequency with which a construction is primed will affect the retrieval of relevant items in memory. Recurrent activation of target words embedded in language constructions resulted in the ease of their access. The learner in our project was more frequently primed to produce certain syntactic structures in the games (McDonough & Mackey, 2008) and the primes mostly involved the target words which repeatedly occurred in the constructions.

5. Conclusion

The findings from the current research revealed that higher teacher talk (input) was not able to ensure optimal lexical production gain in the home

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setting unless it occurred in tandem with higher learner talk (output). In order to gain higher lexical production ability, apart from teacher talk which allows the learner to hear the target words many often, young EFL learners need to be afforded with higher opportunities to talk which will let them use and reuse the same words in their interactions with the teacher.

To note, as a part of a larger study, this case study on a preschooler was conducted almost concurrently with another instructed learning research which aimed at examining the same research questions with 24 preschoolers at a school environment. The games, measurement tools, data collection, and data analysis procedures employed in instructed learning study were mostly inspired by the current case study. We are sanguine that findings from these investigations could shed more light on the future studies investigating the effect of input/output FP in instructed learning. However, with the present case study, the researchers do not harbor any compelling opinions on the generalizability of the findings, but only consider the study with insightful points in terms of the formulated questions, methodology, data collection and young learner measurements for the future frequency-based projects.

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