

The Impact of Different Frequency Patterns on the Syntactic Production of a 6-year-old EFL Home Learner: A Case Study

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Abstract: This longitudinal study investigated the impact of different Frequency Patterns (FP) on the syntactic production of a six-year-old EFL learner in a home context. Target syntactic constructions were presented using games and plays and were traced for their occurrence patterns in input and output. Following each instruction period, the constructions were measured through immediate and delayed oral tests for their effects on the oral production. Instructional and measurement sessions were audio-recorded and transcribed into instruction and measurement corpora. Based on their occurrence rates in input and output, target constructions were categorized into High Input/High Output (HIHO), Low Input/Low Output (LILO), High Input/Low Output (HILO), and Low Input/High Output (LIHO) frequency patterns. Friedman procedure revealed significant differences among the learner's production scores of the constructions with varying FPs. Wilcoxon signed-rank test located significant differences between the constructions with LILO and HIHO and those with HILO and HIHO frequency patterns. The study found that HIHO frequency pattern, in comparison, was the most efficient in developing productive acquisition of syntactic constructions by an EFL young learner. That is to say, instructor's input coupled with learner's output in the form of prompted, reformulated or spontaneous language, played a key part in heightening syntactic production of English as a foreign language. The findings can cast more light on the constantly debated issue of Teacher Talk Time (TTT) and Student Talk Time (STT) and it can be concluded that there should be a balance between TTT and STT so as to yield optimal L2 production gains.

Keywords: EFL Child Learner; Frequency; Input Frequency; Syntactic Constructions; Output Frequency.

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Introduction

A recent shift of attention to the usage-based views towards the use of language and language acquisition has led to the proliferation of studies with insightful findings for both L1 and L2 acquisition (McDonough & Kim, 2009). Inspired by the work of many investigators and language philosophers, Tomasello (2003) proposed a usage-based theory to language acquisition. The theory is premised on two basic grounds: that of *meaning construction in use* and *structure emergence in use*. According to this theory, meaning is socially situated and is not independent from the social acts (Wittgenstein, 1953). Meaning is scaffolded and constructed in social intercourse in order to achieve social goals. Usage-based theories claim that there is rich information in input to let the grammar burgeon inductively. But, inductive learning does not suggest any behavioristic perspective in which the child's mind works in an unstructured linear fashion and is conditioned by means of reinforcing practices (Tomasello, 2003), nor does it imply any connectionist account of learning which assigns no role to the communicative function of the language constructions. Usage-based theories, instead, focus on the meaning-based grammar which emerges from language use itself and from the receptive and productive processes by means of general skills like joint attention, frequency, analogy, categorization, chunking and rich memory storage.

In usage-based models, language system is highly sensitive to input frequency as it causes rapid processing and helps automatic memorization. Forms in input are frequently repeated and segmented through interaction, thereby paving the way for strengthened form-function associations. Frequency of output, the language produced by the language learner, is also argued to play an important part in language acquisition. Mackey and Gass (2002) posited that Swain's (1995; 2005) *output hypothesis* is in harmony with frequency-based learning. Higher interactional frequency of target linguistic items in output provides a chance for reproduction and automatic control of the item and strengthens the connection between form and its meaning. Likewise, Swain (1995) asserted that interactionally reprocessed output constitutes the foremost part of the learner's interlanguage.

Studies have highlighted the significance of input and output in their investigations. As to the relationship between input and language acquisition, for example, findings show that grammar building is the matter of phonological-lexical strings acquired from input (Lieven, 2010). De Houwer's (2007) study on bilingual children revealed that more parental input was needed to learn a minority language in the home. Input features like exposure length, input quantity and richness of L2 context significantly influence young learners' L2 development

(Paradise, 2011). Gathercole (2002a) also studied the impact of input quantity on young English/Spanish bilingual children's acquisition of different aspects of language such as mass/count difference in English, grammatical gender in Spanish and that-trace effects in English and Spanish. She found that children with more encounters with target language outperformed those who met less with the target language at school or in the home. The researcher concluded that input quantity significantly affected the acquisition of relevant linguistic properties in early ages.

Despite these arguments, Swain (1985) has asserted that mere exposure to input cannot account for the acquisition of a second language and it has to be accompanied by the pushed output which is the language above the learners' current normal level (Nation, 2011). Output plays multiple roles in language acquisition (Gass, 2001) including: testing hypotheses in terms of L2 structure and meaning, obtaining possible verification feedback on these hypotheses, moving from meaning processing to syntactic processing and automatizing L2 production for fluency. As with input, studies have found some evidence supporting the effect of output on language acquisition. For instance, Izumi and Bigalow (2000) examined the influence of output on the comprehension of English past hypothetical conditionals. The findings revealed that further opportunities for output improved the subsequent input processing in English learners. Suzuki (2007), employing a pretest-posttest design, also studied the effect of learners' output in the form of uptake on the acquisition of English past tense by 40 Japanese EFL learners. The results of the study showed that the group with output opportunities performed better on the comprehension of the English past tense than the group with no similar chances. Similarly, Bohman, Bedore, Pena, Mendez-Perez and Gillam (2010) found that, compared to L2 input, children's output was more effective for the morphosyntactic development. They found that production influenced the accuracy and automaticity of morphosyntactic constructions.

Now considering the fact that language input and output have significantly favorable roles in learning a second/foreign language in instructed and naturalistic contexts, the current research zeroed in on the *frequency of occurrence* as one of the important features of input and output data. It queried if frequency had any positive effects on EFL home learning and whether different frequency patterns of syntactic constructions in input and output data led to different learning gains by a child EFL learner. The study also looked for efficient Frequency Patterns (FP) leading to the highest syntactic production compared to other FPs. The study was on child EFL learner because some publications on Teaching English to Young Learners

(TEYL) particularly in English as a Foreign Language (EFL) settings show that young learners' learning additional languages may seem to be dissimilar to adults' (Rich, 2014) and learning a foreign language, compared to second language, is likely to be more context-dependent (Mihaljević Djigunović, 2012). Thus, the quality of input, output, and the amount of exposure to input may make the extrapolation of implications from second language findings to foreign language context debatable (Munoz, 2010). With this in mind, studies on TEYL must seek variables positively correlated with learning in such contexts. The present investigation examined the effects of both input and output frequencies (i.e., the number of times the learner hears or produces the same syntactic patterns) on productive acquisition of the constructions. This research was done in a home setting which was very rare compared to naturalistic and even instructed learning and there was a hope that its implications would be insightful to L2 teaching in instructed setting for pre-school children. Three questions were formally posed by the researchers:

1. Are syntactic constructions with various frequencies of occurrence in input and output (frequency patterns =FPs) produced differently by a young L2 preschooler?
2. What was an efficient FP for the young learner's syntactic production in L2?
3. Was EFL home instruction efficient as regards the productive acquisition of the syntactic constructions by a child learner?

Review of the Related Literature

The role of frequency in determining linguistic categories, lexical processing, production and comprehension of the language is considerable (Webb, 2008; Pellicer-Sánchez & Schmitt, 2010; Pellicer-Sánchez, 2015). Crossley, Salsbury, Titak and McNamara (2014, p.302) define raw frequency "as the raw occurrence of linguistic items in the absence of context", i.e., the raw token counts of the constructions of different sizes. It plays an important role in the acquisition of language particularly when it is interpreted within the Zipfian distribution law (1939). Zipfian law states that the most frequently occurring items account for a majority of linguistic tokens. It also postulates that very few numbers of frequent items comprise most instances of input. According to Ellis (2011), while learners encounter thousands of language items, the items to which they are frequently exposed to compose only a smaller set of recurrent items which decrease the input variability for the natural language. This type of distribution is claimed to foster construction development as the more often learners meet an item, the more quickly and accurately they will process it. When the learners hear, read, or

use the same group of items regularly, they will be able to produce them with much facility. However, what makes the role of frequency outstanding in a usage-based language model is not the raw frequency of items in input but rather the usage of frequent constructions in interaction (Crossley et al., 2014). It is argued that absolute frequency cannot purely account for L2 acquisition but language items must be utilized meaningfully, that is, when learners recurrently experience and use an item meaningfully, the likelihood of incorporating that item into a language system will increase. In line with this belief, frequency of output equally plays a key role in the acquisition of structural patterns (McDonough & Kim, 2009) and “functions as a priming mechanism for future input” (Mackey & Gass, 2002, p. 252). This argument was supported by Mackey and Gass (2002) who posited that interactional output and input providing sufficient target-like forms make the instantaneous connection of form and meaning possible for a participant in an interaction. Extensive studies in L1 have supported the place of usage-based models in the acquisition of language structure. But, studies substantiating the use of usage-based theories in L2 are still scant (Wolter & Gyllstad, 2013) particularly as it relates to frequency (R. Ellis, 1994). According to Larsen-Freeman and Long (1991) some insufficient data assign a role to the frequency in terms of its impact on L2 learning but causal claims are premature. Also, R. Ellis (1994) argued that the evidence to support the input frequency effect on L2 acquisition is meager but there is also no adequate evidence to deny its impact.

In recent years, interest in frequency-based studies has led L2 researchers to collect evidence as to the L2 learners' sensitivity to input frequency at different linguistic levels including syntactic level. A study by Goldberg, Casenhiser and Sethuraman (2004) examined the effect of the learning of abstract construction [Subj Obj V-*o*] of high token frequency. It was found that learners who had been exposed to a construction with higher token frequency of a verb performed successfully. This phenomenon was also investigated by McDonough and Kim (2009) who found that repetition of double-object dative construction (e.g., *give me the comb, give me the pencil*), directed Thi EFL learners to detect the frame [V] [NP (recipient)] [NP (patient)]. Also relevant to the frequency effect was Gordon's (2009) study which examined the impact of skewed input vis-à-vis balanced input on the learning of dative and ditransitive construction by two groups of EFL Korean school students. Skewed group was exposed to the input in which only the verb *give* occurred very consistently with the construction and balanced group received input in which different verbs were evenly used with different examples of the construction. Production test and acceptability judgement task

showed no statistically different performance on the English dative constructions. Researchers concluded that presentation of skewed input didn't lead to any performance discrepancy in the groups, that is, the two types of input conditions were equally facilitative in the production of items. In a study, Ellis and Ferreira-Junior (2009a) enquiring into the impact of naturalistic acquisition of type/token distributions in verb-argument constructions (VACs) in the European Science Foundation (ESF) corpus found that learners first acquired the most frequent, prototypical items in input.

Recently eye-tracking procedures have been used in frequency-based L2 acquisition research. Siyanova-Chanturia, Conklin, and van Heuven (2011) used such techniques to scrutinize the reaction time (RT) of Ns group, highly proficient nonnative group and lower proficient nonnative group on binomials (e.g., *bride and groom*) and their reversed formulations (e.g., *groom and bride*). Both NSs group and highly proficient nonnative group's RTs were faster on binomials than reversed types because they had much exposure to binominals. In a similar vein, frequent exposure was accountable for the responses of the participants (NSs, higher proficiency NNSs, and lower proficiency NNSs) on two types of collocations namely congruent (with an equivalent in L1) and incongruent (with no L1 equivalent) in a study by Yamashita and Jiang (2010). It was found that lower proficiency NNSs showed a significantly different RTs and error responses (ERs) on two collocation types, higher proficiency NNSs performed significantly differently only in terms of ERs and NSs' responses did not differ in term of both ERs and RTs. Such results led the researchers to a conclusion that incongruent collocations are low in frequency and are postulated to be processed initially through the L1 but with recurrent exposures direct processing will be affordable.

The above reviews demonstrate that the frequency of linguistic features in input data has a positive effect on the learning of a second/foreign language in instructed and naturalistic contexts. The current study queried if frequency had similar positive effects in home learning and whether varying frequency patterns of syntactic constructions in input and output data resulted in different learning gains by an EFL young learner. The researchers also looked for an efficient FP which could produce the highest syntactic production gain.

Method

Participant and Setting

The current project investigated a six-year-old young female learner called Rony (a pseudonym), who was born in Zanjan, Iran on August 26, 2010. She was brought up in a

context where simultaneously two home languages of Azeri (mother tongue) and Persian (second language) were used for daily conversations and where code switching was prevalent. She was presented with English language in the home by her parent (the first researcher), an English language educator with 16 years of experience at pre-primary, primary, junior and senior high school levels and at university. The learner was instructed in the home because there is no nationwide formal English language pedagogy for preschoolers in the public education system in Iran, and children most often have to wait for formal school education when they are 13 years old and in the 7th grade of junior high school. Parents usually seek unofficial English pedagogy in the privately run English institutions or in pre-primary schools.

Design

The inquiry was examined longitudinally within 11 months. Frequency Patterns (FP) of target syntactic constructions constituted the *independent variable (IV)*. The learner was only exposed to instructor language which formed language *input* in the study and the learner's responses and uptake moves ensuing instructor's implicit corrective feedbacks constituted *output*. The following FPs explored from the data formed different levels of IV:

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

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

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

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

Accurate production of syntactic constructions by the young learner constituted the *dependent variable (DV)*.

Instruction and Target Constructions

Due to the age of the participant, "here and now" tasks were planned based on the themes like supermarket, restaurant, doctor's office, police station, cloth store, toy shop, school, etc. Different materials were utilized in the plays and games depending on the themes. For example, in the 'restaurant play', you could find plastic toy spoons, forks, plates, tea cups, coffee cups, fruits, jar of jam etc. The tasks employed were categorized into focused tasks,

listen and do tasks, question techniques, and interactive tasks (Skehan, 2001; Lyster, 2007). For instance, question techniques were used in the language task portrayed in excerpt 2 where the present progress construction '*Is/Are NP(s) V+ing?*' was introduced implicitly into the play. Prior to this task, as a prelude to the play, Rony had to draw some pictures in response to the instructor's orders (excerpt 1) and use them during the task (excerpt 2).

Excerpt 1

I (Instructor): Hanita is fighting a dragon. Draw, hurry up, hurry up

R (Rony): Dragon!

I: yeah, ezhdeha (dragon)

I: The cow is eating grass. It is eating grass now

R.: *Cow eat grass.

I: A cow is eating grass.

Etc.

Excerpt 2

I: Is the cow eating seed?

R: No

I: Are the ants taking bones?

R: No

I: Is the dog eating bone?

R: Yes

Etc.

In excerpt 2, the instructor asked questions about the pictures and then lets the child guess the truth by responding Yes/No. At the end of the game, the number of the times the player was able to provide correct responses was calculated for each person in order to select the winner. They took turns in playing such games. In another game, to present locative constructions (*It is under/on/behind NP?*) and interrogative locative constructions (*Is it under/on/behind NP?, where is NP?*) the instructor and/or Rony were to hide an object somewhere at home and ask questions about their place while they are looking for the object.

Excerpt 3

I: Where is the pencil? And where is the watch?

R: Ah, under the sofa? (*while she is looking for the object*)

I: No

R: Under the table?

I: Come on, No, where is the watch?

R: It is under theunder theboshgab. (*'boshgab'* means *plate*)

I: Plates? No, No

R: It is ...? It is?

I: Is it...? Is it ...?

R: Is it under the bag?

Etc.

And constructions such as *'What does/do N want/like?'* was presented as below (excerpts 4 and 5):

Excerpt 4

R: *Hello, how are you?*

I: *Hi, how are you?*

R: (*as a waitress she was going to take orders and instructor helped her*)

I: *What ...?*

R: *What do you like?*

I: *Can I have some macaroni?*

R: *Yes*

I: *Can I have a water bottle (while pointing to the water)?*

R: *Here you are.*

I: *Can I have soda? (Pointing to a soda can)*

R: *Here you are.*

I: *Thanks.*

Etc.

The learner also kept a portfolio of her drawings which she used to describe the events, the objects and the people in them in measurement session. Each instruction period lasted between 10 and 18 sessions so as to have the lexical items and constructions recycled in the learner and instructor's language. Each session took around 20 or 25 minutes when the focus was on the meaning and outcome of the games and when there were implicit corrective feedback instances in the form of recasts and elicitation. The instructor, consulting with available animated instructional films and books (*Let's go, Magic English, Opposites and More, Tiny Talk, Wizardora*, to name only a few), decided to base the instructional package and the follow-up measurements on such syntactic construction as WH questions, Yes/No

questions, responses to questions, imperatives, locatives, ditransitives, datives, possessives, etc (see Table 1).

Data Collection and Measurement

Instructional 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, an immediate test was executed with one week interval, followed by a delayed test administered with a two-week interval. Instructor made use of similar games, play contexts and picture descriptions to elicit the target constructions in measurement. In effect, similar contexts played priming and prompting role for the learner to remind her of the relevant language events. The contexts elicited and activated the production of certain syntactic constructions. In measuring the production of some words and constructions, Rony's own drawings were used, the ones she had made during some instruction sessions and kept them 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 are/is V+ing' was going to be tested, she described the events as follows:

Excerpt 5

R: *Ant eating seed.

-: Hanita is going up the ladder.

-: I am fighting dragon

-: *They going to school.

-: *Cow eating grass.

Etc.

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

Excerpt 6

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?

Etc.

At the failure of data elicitation using obligatory measurement contexts, the learner's L1 was used to ask the learner to supply an English equivalent for the Persian utterance appropriate to the context. Consider the construction like 'What does/do N want/like?'. Where the learner was not able to initiate the interaction in the restaurant play the instructor interfered in Persian with the utterance 'chee doust darin?' which means 'what do you like?', indirectly seeking an English rendering from the learner.

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 measurements, each trained construction 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 patterns from the learner. Longer excerpts from teaching and measurement sessions are given in the appendix.

Coding

Following the transcription of instruction sessions, the constructions were manually coded as input and output data. Input texts were placed on the left and output texts were included on the right side of the pages. Then, the constructions were computed for their frequencies of occurrence in the input and output data for the follow-up analysis. Reliability of coding was determined by having an experienced teacher re-transcribe one third of the data. The analysis of inter-coder reliability found Kappa agreements of .91 ($p < 0.00$) and .88 ($p < 0.00$) for the input and output data, respectively. In measurement texts, the first researcher scored and calculated the percentage of the time a learner was able to provide trained constructions in the obligatory context. Consistency in scoring the production was also calculated by getting a PhD candidate to re-score three immediate tests out of nine immediate tests by adhering to agreed-upon scoring procedures. Computation showed a Kappa agreement of .63 ($p < 0.00$) which was considered to be a substantial agreement in the raters' coding. Furthermore, researchers decided to calculate test-retest reliability which provided further data for consistency in measurement. To this end, Spearman rank-order correlation was run on the score sets from immediate tests and delayed tests and the computation came up with the correlation coefficient of .900 ($p = 0.001$).

Around 63 syntactic constructions were explored to have been touched on in all the instruction sessions. Table 1 categorizes the syntactic constructions queried in the study. The number of syntactic constructions as well as the types and respective examples are included in the table:

Table 1. *Target Syntactic Constructions under Analysis in the Instructions and Measurement Sessions*

Syntactic Constructions	Examples	Number
<i>WH questions</i>	WH + is/are +NP	19
<i>Yes/No questions</i>	Is/are NP + V+ ing	8
<i>Responses to questions</i>	Yes Pro do/No Pro don't	18
<i>Imperatives</i>	Draw NP	2
<i>Locatives</i>	NP +is +behind NP	4
<i>Ditransitive</i>	Give+ N/Pro (anim.) + NP	1
<i>Dative</i>	Give NP to N/ Pro (anim.)	1
<i>Possessive</i>	N's N	1
<i>NP + V + IFP</i>	NP wants + IFP	5
<i>NP +Modal +bare IFP</i>	NP +must bare IFP+ NP	4
Total		63

V: Verb, NP: Noun Phrase, IFP: Infinitive Phrase, Pro: pronoun, anim: animate, ADJ: Adjective

As shown in Table 1, various syntactic patterns were scrutinized in terms of their oral production. Some constructions were more abstract than others. For example, the construction '*Can Np+ VP*' has two slots which can be filled by many items while the pattern '*How much is NP?*' has only one slot and the syntactic pattern '*No, they aren't.*' has no slot and thus only token frequencies of this pattern were taken into consideration in coding.

In order to test the hypotheses, the researchers, on the basis of the occurrence rates, categorized 63 syntactic constructions into such 4 types of frequency patterns (FP) as: *High Input/High Output (HIHO)*, *High Input /Low Output (HILO)*, *Low Input/High Output (LIHO)* and *Low Input/Low Output (LILO)*. Thereafter, the data were subjected to further analyses in order to allow the researchers to examine the questions.

Scoring and Data Analysis

The percentage of correct suppliance of the target syntactic constructions 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 items accurately, OC signifies the number of obligatory contexts and UNOC stands for the number of non-obligatory contexts where the learner performed incorrectly. The patterns were measured in

more than one context in order to come up with the ratio of correct use to all uses. To calculate the accuracy of the production of 'N is V+ ing' construction by the learner, for example, 12 obligatory contexts were devised. The learner was able to produce such construction 7 times accurately but also used the same construction inappropriately twice where construction 'what is N+ V+ ing?' was to be used. Thus, the accuracy percentage for the construction was computed in the form of: $\frac{7}{12+2} = 0.5 \%$

To analyze the data, Friedman analytic procedure (a one-way nonparametric test) and Wilcoxon signed-rank test were utilized. They were used to identify the discrepancies in score sets resulting from various frequency patterns.

Results

In order to investigate whether syntactic constructions with various frequencies of occurrence in input and output are produced differently by a young L2 preschooler, high and low frequencies were determined in input and output data. To this end, gross median frequency scores of constructions in input and output data sets were calculated. Then, the data were divided into such FPs as *HIHO*, *HILO*, *LIHO* and *LILO*. Table 2 displays the median frequency scores of the constructions in input and output, the number of the constructions suited in each FP and the highest and lowest frequency scores for input and output.

Table 2. Frequency Patterns (FP) and the Number of Items in each type of FPs

Data sets	Median frequency Scores	Highest-Lowest frequency score	Con. With HIHO	Con. with HILO	Con. with LIHO	Con. with LILO
<i>Input</i>	108	H=856, L= 2	21	11	11	20
<i>Output</i>	32	H= 347, L= 1				

Con.: Construction

Detailed information about the syntactic constructions falling into each FP, their frequency scores in input and output and the production gains (immediate scores, delayed scores and total scores) is provided in Table 3:

Table 3. Syntactic Constructions within each FP

	<i>Con.</i>	Imtest Score %	Deltest. Score %	Total Score %	Input frequency	Output frequency
	<i>he/she/it is V+ing</i>	72	80	76	856	61
	<i>Draw NP</i>	90	60	80	637	58
	<i>Can Np+ VP</i>	100	93	100	543	274
	<i>Are they V+ing?</i>	50	100	73	478	56
	<i>Adj + er</i>	100	100	100	447	131
	<i>What is Pro/NP doing?</i>	100	100	100	329	123
	<i>Give N/Pro (anim.) (inanim.)</i>	100	100	100	320	136
	<i>What is N doing?</i>	100	100	100	310	121
	<i>N is Comp. Adj</i>	83	90	86	260	53
	<i>No, They aren't.</i>	100	100	100	237	161
	<i>I Want to IFP</i>	90	0.71	83	237	139
<i>HIHO (N=21)</i>	<i>Does N like NP</i>	100	100	100	227	67
	<i>Did N/Pro VP?</i>	55	63	58	207	102
	<i>Yes, Pro (I/he/she/it) can</i>	100	100	100	201	319
	<i>Give NP to N/Pro</i>	100	84	91	197	118
	<i>Is it Adj/NP</i>	0.66	100	75	196	128
	<i>Do Pro (You/I) like NP?</i>	90	0	83	184	137
	<i>No, Pro (/he/she/I /it) can't</i>	100	100	100	180	347
	<i>Where is NP?</i>	100	100	100	150	61
	<i>No, Pro (she/he/it) isn't.</i>	0	57	28	133	164
	<i>No, N/Pro didn't.</i>	100	100	100	124	79
	<i>NP's NP</i>	71	70	70	863	0
	<i>N/Pro is Ving.</i>	100	100	100	608	30
	<i>Color NP Adj</i>	33	0	20	340	26
	<i>NP/It is under NP</i>	0	0	0	271	28
	<i>Is Pro (he/she) Ving?</i>	0	0	0	291	18
<i>HILO (N=11)</i>	<i>They are Ving.</i>	63	70	66	266	12
	<i>N had NP</i>	0	0	0	206	1
	<i>NP must V NP</i>	0	0	0	189	12
	<i>NP wants IFP</i>	0	0	0	152	21
	<i>Which N is comp. Adj/Adj</i>	0	0	0	129	25
	<i>NP Vsing NP</i>	0	0	0	110	7
<i>LIHO (N=11)</i>	<i>(NO) Pro (she/he) doesn't.</i>	100	100	100	63	121
	<i>Pro (I/they/you) want to (NO)I/You don't</i>	75	71	73	40	97
		14	0	10	87	87

<i>Con.</i>	Imtest Score %	Deltest. Score %	Total Score %	Input frequency	Output frequency
<i>Yes, Pro did.</i>	71	100	80	102	75
<i>I/ You have NP</i>	0	33	25	80	69
<i>(Yes) Pro (she/he) does</i>	100	100	100	67	61
<i>How much is NP?</i>	100	75	88	90	51
<i>We have NP</i>	0	0	0	62	50
<i>Yes, they are.</i>	85	77	81	84	41
<i>Pro (she/he has) NP</i>	0	0	0	69	36
<i>Yes, Pro (he/she/it) is.</i>	77	33	52	58	32
<i>Is it V+ing?</i>	0	0	0	103	3
<i>Whose N</i>	33	0	16	93	1
<i>who is Adj/comp.Adj</i>	0	0	0	81	13
<i>It is Ving</i>	0	0	0	71	3
<i>Whose N Is it?</i>	14	0	8	68	0
<i>What does N want?</i>	0	0	0	56	3
<i>What are they doing?</i>	20	20	20	54	20
<i>What are N doing?</i>	0	0	0	42	4
<i>What's up</i>	0	0	0	42	8
<i>(Yes) You do.</i>	0	0	0	37	21
<i>How many N does N want/like?</i>	100	100	100	35	21
<i>Is N V+ing?</i>	0	0	0	34	1
<i>N has NP</i>	100	50	50	30	31
<i>Whose N are they?</i>	0	0	0	23	0
<i>What color does N like/want?</i>	0	16	5	15	5
<i>We want IFP</i>	0	0	0	14	6
<i>What color do You like/want?</i>	25	100	25	8	31
<i>What size does N want/like?</i>	75	100	83	7	9
<i>N+ N want to VP</i>	0	0	0	5	3
<i>How many N do you want/like?</i>	0	0	0	2	7

Imtest: Immediate test, Deltest: Delayed test, ADJ: Adjective, IFP: infinitive phrase, Pro; pronoun, anim: animate, inanim: inanimate, N: noun, V: Verb, NP: Noun Phrase, VP: Verb Phrase, Com: Comparative, V_{sing}: singular verb

For example, in the constructions with HILO frequency pattern, only 11 syntactic structures were explored which occurred above the mean frequency score of 108 in input and below the mean frequency score of 32 in output. In the constructions with HIHO frequencies, 21 patterns were found which had been repeated above the mean frequency score of 108 in input and over the mean frequency score of 32 in output.

To examine the questions in the study *total scores* were utilized. They were obtained by averaging the scores from immediate and delayed tests which took into account both short term and long term retention in production. Table 4 exhibits the total scores of four construction sets.

Table 4. *Total Scores from Four Syntactic Construction Sets in the Home Learning*

Total scores from HIHO con.	Total scores from LILO con.	Total scores from LIHO con.	Total scores from HILO con.
76	0	100	70
80	16	73	100
100	0	10	20
73	0	80	0
100	8	25	0
100	0	100	66
100	20	88	0
100	0	0	0
86	0	81	0
100	0	0	0
83	100	52	0
100	0		
58	50		
100	0		
91	5		
75	0		
83	25		
100	83		
100	0		
28	0		
100			
n=21	n=20	n=11	n=11

To respond to the first question (*Are syntactic constructions with various frequencies of occurrence in input and output (frequency patterns =FPs) produced differently by a young L2 preschooler?*), Friedman test was employed. It found statistically significant differences ($\chi^2 = 16.248$, $p = .001$) in the scores of four sets of the constructions with different FPs. The findings, as shown in Table 5, revealed that different FPs led to significantly different production performance by the young learner in terms of syntactic constructions. Thus, it was claimed that syntactic constructions with various frequencies of occurrence in input and output were produced differently by a young L2 preschooler in a home setting in EFL context.

Table 5. One-Way Analysis of Variance of Four Sets of Constructions

Frequency Patterns	N	Median	Df	χ^2	Sig.
<i>HIHI con.</i>	21	100%	3	16.248	.001
<i>HILO con.</i>	11	20%			
<i>LIHO con.</i>	11	73%			
<i>LILO con.</i>	20	0%			

* Alpha= $p < .05$

The second question (*What was an efficient FP for the young learner's syntactic production in L2?*) was examined using Wilcoxon signed-rank test with a Bonferroni correction. This test was also applied to identify where the differences were in the adjusted significant level ($p < .008$). Table 6 displays the results from the comparisons along with the z scores and p-values.

Table 6. Post-hoc Comparisons of FP Pairs using Wilcoxon Signed-rank Test

Pairs	LILO - HIHO	HILO - HIHO	LIHO - HIHO	LIHO - HILO	HILO - LILO	LIHO - LILO
Z	-3.846	-2.770	-2.041	-2.192	-1.129	-2.312
Sig.	.000	.006	.041	.028	.259	.021

* Adjusted alpha = $p < .008$

Post hoc test showed significant differences between the constructions with LILO and HIHO frequency patterns ($z = -3.846$, $p = .000$) and between HILO and HIHO frequency distributions ($z = -2.770$, $p = .006$). However, comparisons between other pairs of FPs such as LIHO – HIHO ($z = -2.041$, $p = .041$), LIHO – LILO ($z = -2.312$, $p = .021$), HILO-LILO ($z = -1.129$, $p = .259$) and LIHO-HILO ($z = -2.192$, $p = .028$) didn't evince statistically significant differences. Such comparisons showed that differences in production were not statistically significant unless syntactic patterns were repeated above the frequency score of 108 in input and over the frequency score of 32 in output in interaction between the learner and instructor. The study demonstrated that higher repetition in input simply could not boost the productive acquisition of constructions if the same items did not show up in learner's output. Thus, it was found that HIHO frequency pattern, in comparison, was an efficient FP for increasing young learner's syntactic production in L2.

The third question (*Was EFL home instruction efficient as regards the productive acquisition of the syntactic constructions by a child learner?*) was also queried. To this end, the percentage of productive acquisition from various periods was obtained and averaged to see if the instruction was efficient. Two tests (an immediate test and a delayed test) were executed on

the learner at the end of each instruction period to examine learning effectiveness. Table 7 presents descriptive statistics for each instruction period. It sets out the number of the target constructions in each period, scores from immediate tests and delayed tests (immediate test comes first and delayed test appears second in the parenthesis) and total scores. Meanwhile, it presents the mean frequency of occurrence of constructions in each period. Descriptive statistics showed that a mean frequency of 167.77 in input and 59.22 in output enabled the learner to produce syntactic patterns almost half of the time as the mean production performance was found to be 47.62% in total score. Furthermore, Figure 1, using the concept of total scores, demonstrates the percentage of the production gain in each period graphically. The findings revealed that EFL home instruction could account for almost 50% of the structure acquisition by a young learner within 11 months. That is, considering the limited amount of input and output in EFL setting, particularly in the home context, the instruction of syntactic constructions through games and plays with parental assistance was proportionally successful.

Table 7. *Syntactic Constructions and their Mean Frequency Rates in Input and Output Data*

Instruction Period (IP)	No. of con.	Im.test Scores (%)	Del.test Scores (%)	Total Scores (%)	Average input frequencies	Average output frequencies
<i>IP1 (Jun 15/Jun 26)</i>	5	20.0	20.0	20.0	184	22
<i>IP2 (July 4/July 19)</i>	5	57.6	55.0	56.0	136	45
<i>IP3 (Aug 7/Aug21)</i>	9	62.6	62.2	62.0	144	35
<i>IP4 (Sep4/Sep19)</i>	10	54.9	42.4	50.8	100	73
<i>IP5 (Oct2/Oct18)</i>	8	66.8	66.6	66.8	317	47
<i>IP6 (Nov7/Nov21)</i>	8	44.5	58.1	41.7	177	59
<i>IP7 (Dec25/Jan14)</i>	7	57.8	48.8	53.5	185	157
<i>IP8 (Feb22/Apr8)</i>	8	48.8	50.6	49.2	110	65
<i>IP9 (May5/May20)</i>	3	27.6	30.0	28.6	157	30
	n=63			Mean= 47.62	Mean= 167.77	Mean= 59.22

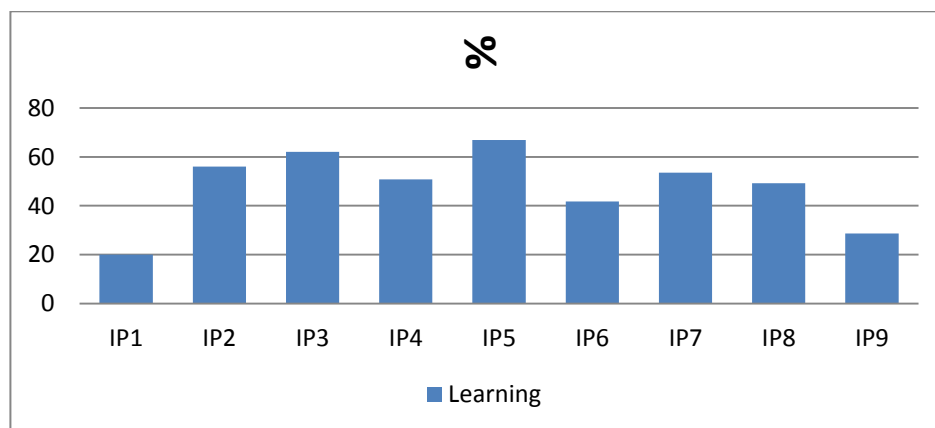


Figure 1. *Percentage of Production Gain at each Instruction Period*

Discussion

The current study examined the possible impact of input and output frequency patterns in interaction on the syntactic production by a child learner. To this end, target syntactic constructions were introduced into the training sessions using appropriate games and plays. They were traced for their frequency rates in input and output and were measured in immediate and delayed tests for the possible effects on the production performance. On the basis of the frequencies of occurrence, target syntactic constructions were categorized into four types: constructions with HIHO, LILO, HILO and LIHO. Non-parametric Analytic procedures were utilized to examine if there were any significant discrepancies in the production gains of the four sets constructions.

The results showed that varying frequency patterns resulted in differential production performance. Where the occurrence rate of syntactic structures increased in interaction, it facilitated the production performance. The findings of this study are congruent with those of McDonough and Kim (2009) who found that repetition of the double-object dative construction (e.g., *give me the comb*, *give me the pencil*) directed the learner to detect the frame [V] [NP (recipient)] [NP (patient)]. In abstract constructions, the use of different items in a certain slot in a construction signaled to the learner that the construction was productive and not lexically specific. If a learner learned, for instance, the frame '*where is he going*' from an input, exposure to more exemplars in which NP slot was replaced with other alternatives (e.g., *where is she going* and *where is the dog going?*) assisted the learner to move from lexically specific construction into building a more generic and abstract construction. The current study also confirms the findings by Goldberg et al., (2004) whose study showed that different input conditions led to significantly discrepant results in terms of learning the construction [Subj Obj V-*o*]. They found that native English learners practicing the construction with skewed frequency where one exemplar of construction enjoyed high token frequency (e.g., one or two verbs occur highly in the construction) performed significantly better than learners who used construction with balanced frequency (e.g., construction is introduced with different novel verbs). Similarly, different frequency patterns/conditions in our case resulted in different learning gains.

Furthermore, what was worthy of attention in the study was the accompaniment of the output with the input in the instruction which made a difference in the production of syntactic constructions by the learner. It was found that mere higher exposure to input did not lead to the same gains as what resulted from the higher frequencies in both input and output. For

example, the constructions 'N has Np' (e.g., *Kiaram has an apple*) and 'Is N/Pro Verb +ing' (e.g., *is Koala eating leaves?*) with higher frequencies of 206 and 291 in input and lower occurrence rates of 1 and 18 in output respectively did not lead the learner to produce them successfully in the test contexts. However, higher occurrences of such constructions as 'Did N VP' (e.g., *Did Hanita play football yesterday?*) and 'What is N doing?' (e.g., *what is ant doing?*) with the frequency scores of 207 and 310 in input and the frequency scores of 102 and 121 in output respectively provided enough form-function mappings which led to their successful production performances later in test tasks.

The primacy of output in the acquisition of syntactic features has been particularly stressed by Swain (1985). She held the view that pushed output compels the learner to process the language at syntactic level while input does not call for such processing and proceeds mainly with semantic mental processing. Our study corroborates the results by Bohman et al. (2010) who found that children's output was more effective for the morphosyntactic development. Their study demonstrated that production influenced the accuracy and automaticity of morphosyntactic constructions. Also, McDonough's (2005) research showed that modified output was the only significant predictor of question development for 60 Thai students of English as a foreign language. Likewise, Suzuki (2007) found that L2 learners receiving recasts with the opportunity for uptake and repair outperformed those with no opportunity to repair and produce correct form.

Regarding the effect of home instruction on preschool children's social, physical, and language developments, positive results have been reported from a well-known program, namely Home Instruction for Parents of Preschool Youngsters (HIPPI) (Brown, 2013; Hoff, 2013). The program aims at preparing preschool children for future school success through parents' assistance at home. For example, Nievar, Jacobson, Chen, Johnson, and Dier (2011) found that HIPPI students performed 0.43 standard deviation higher than their counterparts without HIPPI experiences. The results from our study provided additional positive early home instruction evidence in terms of early foreign language instruction. Our findings revealed that EFL learning by children directed by parents at home helped children acquire almost 50% of the syntactic constructions.

The current study also casts more light on the constantly debated issue of reducing teacher talk time (TTT) and boosting student talk time (STT). It has long been argued that teachers hold the floor in the classroom which in turn retrenches the opportunities afforded to student talk (Nunan, 1991). Ross (1992) asserted that ample teacher talk time does not by any

means lead to the development of learners' L2 comprehension and communication skills. The results from our study, however, did not authenticate this argument and instead provided some evidence that, for the optimal production performance, L2 learning context must supply increased amount of talk opportunities for both parties. This is consonant with the views by some researchers (Hall, 2011; Nizegorodcew, 2007) who do not consent to the minimization of TTT and maintain that teacher talk allows interactional discourse modifications conducive to sufficient meaning negotiation. Thus, a secure position is to get a balance between TTT and STT so as to yield optimal L2 production gains.

Conclusion

This study relied on corpora, formed by the current researchers of a child who was learning English as a foreign language at home context for eleven months. The project mainly aimed at examining if different input/output frequency patterns led to differential syntactic productions in a home setting and whether there was any efficient FP for the oral production of syntactic constructions in English as a foreign language. The study demonstrated that FP did make a difference in the syntactic production of an EFL young home learner. In addition, the findings showed that higher frequency of structures in input could not alone account for the better syntactic production performance unless recurrent exposures to input were bolstered by the higher opportunities of reformulation of structures by the learner. Therefore, it seems quite plausible to recommend striking a balance between teacher talking times (input) and student talking time (output). The evidence from the research implies, though tentatively, that early EFL programs need to provide the children with sufficient language practices which are meaning-focused, theme-based, and game-oriented. Classroom input can prove efficacious for the acquisition of English language structures if sufficient opportunities for producing, making errors, and reformulating L2 structures are given to children in early ages. Moreover, there are many families who can benefit from such home-based EFL programs in which parents with some English knowledge can help their children with learning English at home settings. Daily use of child-oriented themes, toys and plays can provide a favorable ground for the learning of a foreign language in a home context.

Although the insights from the case study are worthwhile, the generalizations from the findings are premature and any pedagogical recommendations and suggestions must be done with care. Moreover, the instructor as the only source of input in the study was the learner's parent whose relation and intimacy might have affected the outcome. To substantiate current

findings, multiple case studies from various home contexts are to be done by interested researchers. However, research on young learners in the home context naturally suffers from some limitations like finding appropriate participants, conducting longitudinal study on children, and motivating them to take part in games utilizing a new language. Meanwhile, children at this age are less cooperative especially when formal oral tests are to be exercised for research goal. Thus, studies on young learners' language development are required to be handled with much caution and sensitivity in EFL contexts.

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Appendix

Excerpts from some sessions of theme-based plays have been included here. Particular syntactic constructions were taught through games and plays. In order to save space, only select excerpts are incorporated below:

5th session of 'I won' game: Construction: ditransitives

- | | |
|---|--|
| I: Hi Ronia, how are you. Mesleh ghabl vakhti goftam ye chizi ro be pishi bede, be aroosak ya be shakhse rooberoush bede, yani baraksesh. Va har eshtebah ye emtiaz be man mideh. Havas jam azizam. Started ... | I: Give |
| I: Give pishi the eyeglasses | R: Give Ronia the shakarabad (laughing) |
| I: aha, good | I: Shshsh (laughing) saltshaker |
| I: Give me the spoon | R: Saltshaker |
| I: Yes, thank you, | I: Go ahead my baby, go ahead |
| I: Give Ronia (in bood ras migi) give Ronia the comb | R: Give Ronia the scissors |
| I: Baba che bahooshi | I: The scissors |
| I: Give daddy, give me, give daddy the scissors | R: Scissors |
| | T: There you go |
| | R: I want ... |
| I: Chand emtiaz shody, Hala nobeth to hast. you start baby. | I: Give |
| I: uhum | R: Give Ronia the spoon |
| R: These Ronia | I: Very good honey, Ronia is my honey |
| | R: Give pishi (maloos) |
| | I: {I:uhum} I:give pishi(maloos).... ? |
| | R: Glass |
| | I: What glass? Aha here you are |
| | R:oh, no Daddy, eshtebah shod. Ye emtiaz kam mishe |
| | Etc. |

10th session: 'in the shop' play : Construction: Datives

- | | |
|---|---|
| I: To shorough kon, man emruz mikham barandeh sham. Ba sorrat miporsam, ye eshtebah kardy misuzi nobateh man mishe. | R: Iron |
| I: Ronia give give iron to yourself | I: To yourse |
| R: Me, iron? | R: Iron to yourself.... Yourself chieh? |
| I: Yeah | I: Yourself 'khodet' |
| | R: Khodamam, yani chi (child crying) |

I: Yes, give the sweeper, give the sweeper to yourself, to yourself.

R: Ineh sweeper? Aha ok.

I: No no to yourself, not to me.

I: Yourself yani khodet dige. Come on.

R: Chand ta be khodem bedam?

I: Only 5 objects, only 5, 5.

I: Give the sweeper to....

R: Panj.

I: Yeah no farsi

I: Give the, give the sweeper to me.

R: Yadam raft

I: Pass the eye shadow to yourself

R: Eye shadow

I: Aha, that's it. Good.

R: Ha be ki bedam?

I: To yourself, yourself, you, yourself

R: Baba yekisho bego.bas yani chi yourself

I: Khodet dige, be khodet bede

R: Bas unyekish chi. be koala nemidi

Excerpts from measurement corpora:

• Immediate test of Construction 'Possessives': (The child asks questions about the pictures drawn during the play): the child asks questions about which object belongs to whom. If the instructor cannot tell the truth, he will lose.

I: Go ahead, ok

R: Are they, Are they Ronia's chairs?

I: No they are not

R: Are they Mohammad's chairs?

R: Are they?

I: فقط يك نيمکت

R: کتونی

I: No desk

I: I don't like coala

R: Why, why, I like coala, pas man bazi nemikonam.

R: Yourself sakhte, you begoo

I: Give the candle..., give the candle to ... to her.

R: To her

I: Her, yes

R: Chizaye bado midi be coala

I: Sorry baby, give the sharpner to her.

.....

.....

I: Hala bebinim ke chi dareh.

I: I have I have the comb, I have the comb but he has the ... ha...

R: Hanger...

R: I have pussycat, eye shadow.

I: I have. ...

Etc

R: کتونی

I: Ok,they are boots.

R: Are they Aghajoon's boots?

I: No, they are not

R: Are they mother's boots?

I: No, they are not

R : Are they grandfather's

I : Boots

Etc.

