

**Productivity of verb inflections in Bangla-speaking pre-school children**

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**Dedication**

*I would like to dedicate my thesis to two couples,  
who gave me the life and showed me the light...*

***Md. Ezazul Islam & Shoeyba Sultana,***

*and*

***Md. Mehedi Masud & Tazin Sultana***

*Your love, affection, encouragement and blessings  
have always been a source of inspiration for me.*

*Abba-Ma, Baba-Tamoni—I owe you the most!*

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### **Declaration**

I certify that the work presented in this dissertation is my original work to the best of my knowledge and belief. The contributions of other sources and information have been acknowledged wherever they have been used. I, hereby, declare that I have not submitted this material, either in a whole or part, previously or concurrently in this or any other institution.

Lubaba Sanjana

August 2016

## Table of Contents

Sections	Titles	Page numbers
	<b>Acknowledgement</b>	iv
	<b>Declaration</b>	v
	Title	1
	Abstract	2
1	<b>Introduction</b>	3-5
	<b>Problem Statement</b>	3
	<b>Purpose of the Study</b>	4
	<b>Central Research Questions</b>	4
	<b>Significance of the Study</b>	4
	<b>Delimitations</b>	4
	<b>Limitations</b>	4
	<b>Operational Definitions</b>	5
2	<b>Literature Reviews</b>	6-13
	<b>The <i>Item-Based</i> Approach</b>	6
	<b>Productivity</b>	7
	<b>The <i>Verb Island Hypothesis</i></b>	8
	<b>The <i>Wug Test</i></b>	10
	<b>Background on Bangla Verb Morphology</b>	10
	<b>Theories Used for Experimentation</b>	12
	<b>Theories Used for Data Analysis</b>	13
3	<b>Research Methodology</b>	14-19
	<b>Research Design</b>	14
	<b>Transcription.</b>	14
	<b>Theoretical Framework</b>	15
	<b>Participants</b>	15
	<b>Sampling</b>	15
	<b>Setting</b>	15
	<b>Instrumentation</b>	16
	<b>Data Collection Procedure</b>	17
	<b>Data Analysis Procedure</b>	18

	<b>Obstacles Encountered</b>	19
4	<b>Analysis</b>	20-30
	<b>Measuring Verb Productivity</b>	20
	<b>Measuring Inflectional Productivity</b>	26
5	<b>Discussion</b>	31-36
	<b>Addressing the Central Research Questions</b>	31
	<b>Further Points to Discuss</b>	34
6	<b>Conclusion</b>	37-39
	<b>Summary of the Findings</b>	37
	<b>Contribution to Research</b>	37
	<b>Practical Implication</b>	38
	<b>Recommendations</b>	38
	<b>Further Studies</b>	38
	<b>Conclusion</b>	38
	<b>References</b>	40-44
	<b>Appendices</b>	45-46
	Appendix A	45
	Appendix B	46

Productivity of Verb Inflections in Bangla-Speaking Pre-School Children

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## Abstract

This study attempts to find out the productivity of verb inflections of Bangla speaking pre-school children. It focuses on the spontaneous speech samples of 30 children aged 2 to 4, to explore the developmental sequence of verb inflectional productivity. In order to do so, it showcases the findings in both the cases of verb productivity and inflectional productivity, by applying particular productivity criteria. This research further identifies that the children follow an item-based approach, in terms of acquiring verb inflections. The findings, thus can guide through the future studies, especially those dealing with child language development in Bangla.

The researcher has tried to figure out the answers of these questions:

- a) Whether children have a productive approach in terms of acquiring verb inflections? To illustrate, do children learn following *item-based approach*? (Tomasello, 2000a)
- b) What is the nature of productivity in Bangla-speaking children aged 2 to 4, in case of acquiring verb inflections?

### Productivity of Verb Inflections in Bangla-Speaking Pre-School Children

The acquisition of verb inflections has been an interesting field of the research of child language development. Many studies have been conducted in order to investigate the acquisition procedure of verb inflections, in case of many languages including Spanish (Aguado-Orea & Pine, 2015), German (Brandt, Verhagen, Lieven, & Tomasello, 2011), Italian (Guasti, 1993; Pizzuto & Caselli, 1994), Hebrew (Lustigman, 2012), English (Rispoli, 1991; Hohenstein & Akhtar, 2007; Tomasello, 2009) and so on. There is not much evidence of studies focusing on children's acquisition of Bangla verb inflections (Chakraborty & Leonard, 2012).

This study attempts to find out the particular manner in which Bangla speaking children acquire verb inflections. It also looks for elements that can indicate if Bangla speaking children show a development sequence across age, in terms of being productive with verb inflections. By measuring the productivity, this study identifies the productive verb stems and productive verb inflections that the speech samples of 30 children carry. This study is an attempt to present an accurate scenario of productivity in the speech of typically developing Bangla speaking pre-school children.

#### **Problem Statement**

In Bangla language, a verb form cannot have a bare stem; verbs need to be used with inflections. For this reason, a single verb root can take more than 50 different forms (Dasgupta & Ng, 2006, p. 312). This shows how rich Bangla language is, in terms of morphology, which makes it comparatively complex from other languages. However, how the Bangla speaking children acquire this particular aspect, has not yet been explored significantly. This study addresses this problem and investigates if Bangla speaking pre-school children follow a particular approach while learning verb inflections.

**Purpose of the Study**

This study intends to identify the early development of verb inflections in Bangla speaking pre-school children. It tries to figure out if there is any development sequence regarding the productivity of verb inflections.

**Central Research Questions**

This study attempts to find out answers to these questions:

- a) Whether children have a productive approach in terms of acquiring verb inflections? To illustrate, do children learn following a particular fashion—*item-based approach* (Tomasello, 2000a)?
- b) What is the nature of productivity in Bangla-speaking children aged 2 to 4, in case of acquiring verb inflections?

**Significance of the Study**

This study will shed light on the existing literature on the language acquisition process of Bangla. It may also contribute to the knowledge of productivity of verb inflections among pre-school children.

**Delimitations**

Only 3 day care centres have been used for collecting data. However, the researcher has collected in-depth information from those places. She tries to conduct an elaborate study based on the findings from those particular day care centres.

Besides, for the ease of the research, this study only focuses on simple verb forms. This has made it possible to work with a specific linguistic element.

**Limitations**

The limitations of this study are:

- a) The inclusion of other verb forms could have added more radical findings.

b) The findings would have been more authentic and powerful if the number of children of this study could be increased. Nevertheless, the researcher has tried to address all the possible outcomes.

c) Even though, the researcher has counted diversity among the participants; the expansion in sample size might depict statistically more strong and authentic result.

### **Operational Definitions**

Definitions of some core concepts used in this research are:

a) productivity: Productivity can be defined by counting how many different inflections are produced with the same verb, and vice versa (D'Odorico, Fasolo, Cassibba & Costantini, 2011). Children's use of inflections can be productive if and only if all of the inflections are grammatically required (Lustigman, 2012).

b) the item-based approach: The early linguistic competence of children is item-based where their utterances are organized around concrete and particular words and phrases. The adult-like linguistic constructions can be gradually acquired in a "piecemeal fashion" (Tomasello, 2000a, p. 156).

c) verb productivity: A verb stem will be productive if that stem is used with at least two different inflections.

d) inflectional productivity: An inflection will be productive if the same inflection can be used with at least two different verb stems.

### **Literature Reviews**

This chapter presents the existing literature that addresses child language development. The researcher focuses especially on some proposals on language acquisition by Tomasello (2000a, 2000b, 2009). Besides, studies on the acquisition of verb inflections are also presented in this chapter. The researcher further provides some conventional procedures of measuring productivity of linguistic elements in children's speech.

#### **The *Item-Based Approach***

A paradigm to study child language development is proposed by Tomasello (2000a). He suggests that children initially learn "concrete linguistic expressions" through imitation, later they use their "general cognitive and social-cognitive skills" to "categorize, schematize and creatively combine" individually learned expressions and structure (Tomasello, 2000a, p. 156). He further argues that adult-like linguistic constructions can be gradually acquired by following an "item-based" approach in a "piecemeal fashion" (p. 156). This categorization, however, may not be evident in very early stage of child language development. In such cases, the use of certain verb forms may occur without assigning them to relevant inflectional categories (Lustigman, 2012). Hence, the age of children need to be taken into account to examine their use of verbs in any linguistic and extra-linguistic contexts.

Similarly, study also shows that children observe patterns of language used in the environment and gradually, sometimes one verb at a time, form hypotheses about the underlying rules that eventually change through their cognitive and social maturity (Owens Jr., 2014). Therefore, the development of verb inflection is a gradual process that includes "probabilistic learning and generalization", as opposed to the claim that there occurs an "instantaneous mapping" of inflections to particular cells which were in a pre-given paradigm (Aguado-Orea & Pine, 2015, p.18).

The “incremental nature” of first language acquisition can be distinct in two ways: in utterance level and in grammatical level (Ellis, 1985, p. 46). In case of utterance level, there will be a gradual increase in the length of children’s utterance. Again, by constant revision of grammatical rules, children will generate structures which gradually become adult-like (Ellis, 1985).

Lust (2006), however, confronts this theory by posing several issues. She believes that this theory needs to clarify the specific mechanisms that offer children to convert from an individual item to a generalized pattern. She further questions the means in which children determine “similarity” across construction in order to construct proper generalization without linguistic analyses (Lust, 2006, p. 68).

### **Productivity**

Productivity is the use of a particular expression in a frequent and creative way (Lust, 2006). To illustrate, a child will acquire the productivity of a particular linguistic item if s/he can creatively use that item in a natural setting, as opposed to rote-learning. Study describes three processes related to productivity—segmentation, categorization, and recombination (Brandt, et al., 2011). Even before being productive, children tend to segment and recombine in order to form novel utterances (Brandt et al., 2011). Productivity can be defined by counting how many different inflections are produced with the same verb, and vice versa (D’Odorico et al., 2011).

Nonetheless, creativity has to be consistent with the language in use. Creating random words that not depict the general use of language will not be considered productive (Pustynnikov & Schneider-Wiejowski, 2009). Furthermore, productivity of verbal inflection includes not only the addition of inflections to verb stems; but also the appropriate dropping of inflections from verbs. This will be considered productivity only when the child drops inflection in an appropriate syntactic context (Hohenstein & Akhter, 2007). Therefore, if a

child avoids using an inflection, only because s/he finds it difficult to utter the inflected verb form, that must not indicate the child's productivity. The addition or omission of inflections should not be random, but be "grammatically required" by the linguistic context, in order to be productive (Lustigman, 2012, p. 49).

Similarly, rote-learned items do not showcase productivity. Rote-learning can follow certain technique that may involve *chunking*. When certain lexical items are frequently used together following a particular pattern and also treated as one unit, they must not be considered productive (Brandt et al., 2011). This claim is primarily because of the fact that in case of children, such chunks or formulaic expressions do not reflect their knowledge of underlying morphological or syntactic rules (Lightbown & Spada, 2006). Such syntactic constructions will only be considered productive when a child gradually can use such elements in greater variety, and when s/he knows how to transfer from item-specific to item-general.

Productivity can assess multiple features from children's speech. Whether a form occurs in an obligatory context; the presence, absence or frequency of that particular form in given context; and also whether a child uses a constituent in several forms—all these aspects can be determined by measuring productivity (Lust, 2006).

### ***The Verb Island Hypothesis***

The verb island hypothesis, which emerges in the late twentieth century, is a theory that explains how young children acquire verb within a particular age. According to this theory, the syntactic competence in young children has independent constructions, where each verb can be considered one island (Tomasello, 2000b, 2009). Due to the limited generality, children cannot transfer their existing knowledge in case of constructing novel items, at least before 3 years of age. Depending on the usage that one child gets to observe, specific verb island constructions will be established in varied degree (Tomasello, 2009).

Rispoli (1991) provides his analogy where he compares children's understanding of grammatical categories with mosaic. He claims that as children do not acquire all of the aspects of grammar simultaneously; they gradually become productive with some linguistic elements, one before other. The non-productive early use of verbs gradually get replaced by inflectionally more elaborated forms, which indicates that children's acquisition of productive knowledge of inflectional morphology is a gradual process (Lustigman, 2012). Especially in case of the knowledge of verb inflection, development occurs gradually and is not fully productive from the earliest stages (Aguado-Orea & Pine, 2015). Children's exposure to the adult speech might help them to acquire linguistic elements gradually. Research affirms that children use verbs only in ways they have heard them used; until they have enough experience with different verbs (Hohenstein & Akhtar, 2007).

However, the claim of verb island hypothesis faces criticisms. Researchers argue that such hypothesis takes into account the syntagmatic constraints regarding the grammatical agreement that are only confined to highly familiar lexemes (Lustigman, 2012, p. 62). Therefore, in case of low familiar lexemes, how the rote-learned forms face a shift towards more specific forms needed to be analyzed.

Another similar claim mentions that while examining the development of productive rules from abstract schemas, this hypothesis focuses on high frequency verbs (Brandt et al., 2011). To illustrate, according to this hypothesis, only high frequency verbs potentially support the development of verb-specific schemas.

Furthermore, one of the studies shows negative evidence of this hypothesis. Ninio (2003) argues that this hypothesis considers learning happening to be only vertically, but not horizontally. The developing lexical verb is said to *know* only its own antecedent grammatical behaviour but it will be *blind* to the already-learned grammar of other verbs,

hence, verb island hypothesis does not recognize linguistic input as a source of knowledge (Ninio, 2003).

### **The *Wug Test***

The learning of English morphology by children has been studied through different means. One of the first and prominent tests is the wug test (Gleason, 1958). A group of pre-school children have been used as participants for the test. One of the procedures of this test includes measuring the use of plural marking inflections. The children are shown imaginary bird-like animal named *wug*. Based on the given context, some of the children have used plural form of the word, which is *wugs*. It shows that even with novel words, children can apply their knowledge of forming plural forms that they never have heard before. By using nonsensical materials, Gleason (1958) tries to figure out the knowledge of morphological rules acquired by children. Through the test it has proved that the acquisition of grammatical morphemes develops systematically where children go beyond what they have heard, to construct novel structures (Lightbown & Spada, 2006).

### **Background on Bangla Verb Morphology**

Bangla language has predominantly two types of verbs, simple verbs and complex verbs (Chatterjee, 2014). These complex verbs are often subdivided into two categories, conjunct verbs and compound verbs (Bhattacharyya, Chakrabarti & Sharma, 2006; Bhattacharja, 2010). Therefore, a total of 3 types of verbs can be identified in Bangla language: simple, conjunct and complex. A detailed table demonstrating the verbal system of Bangla language is given in Appendix A.

In Bangla, the agreement of verb does not change its form based on gender or number; rather it changes with respect to tense, aspect, modality and person only (Bhattacharya, Choudhury, Sarkar, & Basu, 2005). This verb agreement feature is restricted to 3 forms of persons, i.e. 1st person, 2nd person and 3rd person (Mondal, 2014). In order to

use these person markers separately based on different verb forms, a child needs to understand the differences among different persons.

In this respect, research shows that one of the most important steps in cognitive development of children is to understand the difference between the “self” and the “rest of the world” (Schmalstieg, 1977, p. 72). Therefore, it might be reasonable to claim that the correct use of person markers is considered to be more “vulnerable” than tense and aspect (Chakraborty & Leonard, 2012, p. 50).

Moreover, researchers claim that children acquire the knowledge of verbal agreement at a very early age (Buijs, Reijen & Weerman, 2013). Nonetheless, without having the knowledge of agreement paradigm, very young learners can distinguish between verb categories, like finite and non finite (Guasti, 1993). However, Ionin and Wexler (2002) mention that while acquiring L1, children aged 2 to 4 years can show inconsistent behaviour in using verb forms. Study affirms such behaviour in case of English language. It can be seen that the development of ‘noun versus verb’ agreement and ‘verbal inflection’ in children is asymmetrical (Conti-Ramsden & Windfuhr, 2002). A similar scenario is present in case of Bangla. The development of verbal inflection for 1st and 3rd person emerges earlier than 2nd person marker (Chakraborty & Leonard, 2012).

One of the earliest theories regarding language acquisition is *processability theory* proposed by Pienemann (1999, 2003), which suggests that language acquisition deals with one’s capacity to process. This processing capacity allows an individual to exhibit his/her existing knowledge into real life use (as cited in Lightbown & Spada, 2006). In the case of language itself, Bangla is considered to have “morphological richness” since a single verb root can take more than 50 different forms (Dasgupta & Ng, 2006, p. 312). Therefore, the diversity that Bangla morphology offers may cause the possible difficulty a child might have to process varied choices while acquiring several verb forms.

### **Theories Used for Experimentation**

Study shows the evidence of partial productivity of children's early knowledge of verb inflections through comparative study between samples of child and adult speech (Aguado-Orea & Pine, 2015). A similar study by Chakraborty and Leonard (2012) uses elicitation task and demonstrates that Bangla-speaking children achieve high level of accuracy in verb inflection both in present and past tense. It also claims that agreement paradigm of Bangla can be one of the reasons for which children can use accurate verbal inflection (Chakraborty & Leonard, 2012).

In order to observe grammatical production capacity of participants, elicitation task can be considered one of the effective instruments (Hesketh, 2004). However, it can also lead to some difficulties. Mackey and Gass (2005) mention that even after receiving prompts, participants can use different forms other than the target form.

Similarly, naturalistic interaction has some disadvantages including the amount of time and manpower it demands for recording, transcribing, and coding data (Rowe, 2012). Therefore, specific constructions of linguistic system may not occur in a particular child's language sample (Lust, 2006), which is one of the limitations of such instrument. Keeping this in mind, a researcher needs to design the study in such a way that can ensure of getting a target response within a suitable time span.

In this respect, Owens Jr. (2014) states that any sample should fulfill two requirements of "naturalness" and "representativeness", mostly by ensuring familiar situation, and ample free space to move for participants (p. 60). Study affirms that a researcher needs to make sure that the process of sample collection is natural and not inhibited by any means (Bornstein, Painter & Genervo, 2000)

However, the present study chooses to focus only on the children's speech in order to figure out the development sequence on productivity of children's verb inflection. Besides, naturalistic data collection requires the least amount of in-depth knowledge prior to the data collection procedure (Eisenbeiss, 2010). This study uses spontaneous speech samples to investigate the development sequence of verb inflections in young children.

### **Theories Used for Data Analysis**

In order to measure productivity, Pustynnikov, O., & Schneider-Wiejowski, K. (2009) propose some quantitative approaches. These include measuring productivity in the narrow sense (Baayen, 1991), productivity based on type frequency (Kreyer, 2009), Hapax-conditioned productivity (Baayen, 1992) and Simulation Rank. However, these measures are suitable for measuring only derivational productivity of morphology.

For inflectional morphology, even though frequency is not the only factor that determines productivity, it can indicate the level of a child's productivity with particular linguistic items (Brandt et al., 2011). The nature of morphological productivity can be analyzed by following two criteria of productivity proposed by Pizzuto & Caselli (1994), where the use of the "same inflection with two roots" and the use of the "same root with two inflections" are considered to be productive (p. 164).

### **Research Methodology**

The central research questions of this study are—whether young children learn verbs following an item-based approach, and what the nature of their productivity of verb inflections is. In this chapter, the researcher discusses the methods, which have been applied to collect data for this study. Moreover, this chapter covers the design of research, theoretical framework, sampling, instrumentation and obstacles encountered. Besides, the setting of the organization from where the data have been collected is also explained in this chapter.

### **Research Design**

This research has been designed to investigate whether Bangla speaking pre-school children aged 2 to 4 learn verbs following a particular fashion—item based approach (Tomasello, 2000a). Besides, this research also intends to figure out the nature of productivity in terms of verb inflections among pre-school children. For which, spontaneous speech samples have been collected from 30 pre-school children aged 2 to 4. To facilitate, the researcher has to appeal for permission to the authority of 3 day care centres in Dhaka. The researcher has been given 30 typically developing children, among them 14 are girls and 16 are boys. There has been no intentional intervention by the researcher, since that can encourage the child to repeat the verbs after hearing from the researcher. The researcher only has given minimal prompts which are necessary to facilitate the data collection procedure. The data then are analyzed solely focusing on the use of inflections in case of simple verb forms.

**Transcription.** Data collection, transcription and coding need to be “consistent and systematic” in order to make sure that data are comparable across natural speech samples (Lust, 2006, p. 132). By keeping this in mind, the researcher has done a morphological transcription where she has transcribed only the simple verbs used by the children. Due to the absence of particular direction, the researcher has avoided to work with conjunct and

compound verbs. Besides, any use of verbs by children, imitating the researcher, is not taken into account.

### **Theoretical Framework**

The spontaneous speech samples are examined through the lens of item based approach (Tomasello, 2000a). This research also looks for elements whether they can suit to the claim of verb island hypothesis (Tomasello, 2009). Besides, the nature of morphological productivity has been analyzed by following two criteria of productivity proposed by Pizzuto & Caselli (1994). According to their proposal, for each inflection type, the use of the “same inflection with two roots” and the use of the “same root with two inflections” will be considered productive (Pizzuto & Caselli, 1994, p. 164).

### **Participants**

The participants for this research are 30 pre-school children aged from 2 to 4 ( $M = 2.8$ ,  $SD = 0.6$ ). They are from 3 different day care centres in Dhaka. Among them, 14 are girls and 16 are boys. All of their parents work as employee or businessperson.

### **Sampling**

The sample used in this research comprises of 30 pre-school children aged 2 to 4. They have been selected from 3 different day care centres, whose names can be assumed X,Y,Z. The number of participants from each day care centre is X:Y:Z= 1:11:18. Based on their age, the participants have been chosen by their caregivers. Overall, 47% of the sample is girl, and the rest 53% is boy. It is to be mentioned that the researcher deliberately has requested the authority of day care centres to provide children with typical language development. Through this, she has tried to keep the survey unbiased or equitable.

### **Setting**

This study has been conducted in a natural setting to make the children comfortable. Besides, good sound quality has to be ensured by minimizing vibrations and external noise

(Eisenbeiss, 2010). Therefore, the researcher has requested the authority to give a quiet space so that children's speech can be recorded properly. Since the children spend most of the time of the day in a day care centre, it has been assumed that day care centre will not only be familiar but also less stressful setting for the children. Nonetheless, a stranger may either constrain or promote child language depending on his/her behaviour and attitude towards the child (Bornstein et al., 2000). Therefore, if a child feels threatened; s/he might not produce language at all. All these aspects have been kept in mind before collecting data. All of the participants have also been given similar environmental settings. Thus, it can be said that the responses of each child are likely to be reliable, having no prejudices.

### **Instrumentation**

It is to be mentioned that productivity of children's verb inflection can be studied through two means: by using elicitation techniques to focus on weak areas in the children's use of verb inflection, or by collecting sufficiently rich naturalistic speech samples which can allow detailed analysis of verb inflection (Aguado-Orea & Pine, 2015). For this current study, the researcher has decided to collect spontaneous speech samples from the children. Studying children's language production through the recording and transcription of natural speech is considered to be one of the prominent methods of studying child language development (Lust, 2006). Ideally, the minimum time for recording is about 10 minutes, while the maximum time can be up to several hours (Rowe, 2012).

In order to encourage spontaneous speech production, the researcher has used some sets of toys. Besides, participants may provide with incomparable speech samples by talking about different topics (Eisenbeiss, 2010). To standardize the environmental setting across person and place, the researcher has kept the same toys consistent for each child. She also has to make sure that each child gets engaged in the play session for at least 20 minutes. Hence, the researcher has been prepared to engage children with ample amount of lucrative toy-sets

that include a house set, a cooking set, a food set, some animals and a stethoscope. In order to preserve the children's interest in the play session, the researcher has not given the toys all at once but gradually.

### **Data Collection Procedure**

In order to reduce the number of variables for this study, the researcher has opted for several steps to ensure uniformity across different speech samples. Firstly, she has decided to go to day care centres to collect sample speech from children. Day care centres generally provide with similar arrangements and facilities for children. Therefore, she has visited 4 day care centres and has got access to 3 of them. The procedure has been started by seeking for permission from the authorities of day care centres. The researcher has submitted a recommendation letter written by her supervisor. The authorities have granted permission and have allowed performing the data collection procedure. They also have allowed conducting a 20 minutes play session along with video recording for each child. The authorities of 2 day care centres have been kind enough to permit the researcher to perform the data collection procedure according to her suitable schedule. However, in one of the centres, the researcher has to follow the fixed schedule provided by the authority.

The researcher has recorded the speech samples for 20 minutes in case of each child. She has spent around 10 minutes in order to get acquainted with the child, before starting the actual play session. The reason behind such step is that while talking to strangers, young children tend to respond more positively in familiar circumstances as opposed to in unfamiliar ones (Bornstein et al., 2000). The researcher has to make sure that she gets enough time to build a rapport with each child; otherwise, the sample might not ensure spontaneity. Again, ensuring the stability is one of the key factors that can affect the nature and development of child language (Bornstein et al., 2000, p. 410). Hence, by taking permission,

the researcher has used the same sets of toys for each child in order to be consistent. Two sets of digital camera and a stopwatch are also been used in the data collection procedure.

### **Data Analysis Procedure**

The analysis of collected data has been done following several steps. First of all, the completely or partially comprehensible utterances that have carried any simple verb forms are transcribed. It needs to be mentioned here that Bangla language has 3 different kinds of verbs, which are simple verbs, conjunct verbs and compound verbs (Bhattacharyya et al., 2006; Battacharja, 2010 & Chatterjee, 2014). Since there is no particular direction regarding the analysis of conjunct and compound verbs, it is difficult to draw any conclusion regarding these two verbs. Hence, the researcher has focused only on the use of one-worded or simple verbs.

Then, in order to examine the productivity of verb stems, the researcher has tallied down the verb stems along with the number of different verb forms, for each child. This has made it possible to recognize the number of productive verbs for each child. Afterwards, the researcher has looked into children's productivity of verb inflections. This time, the researcher focuses on all and only inflections involving person, tense and aspectual information. As a result, the productivity of verb inflections for each child could also be identified.

Apart from these, the researcher also provides the mean score and standard deviation of productivity of both verb stems and inflections. She has done this by dividing the sample into 4 different age groups, which are, group *A* (2.0 to 2.5), group *B* (2.6 to 2.11), group *C* (3.0 to 3.5) and group *D* (3.6 to 4.0). This particular aspect has helped the researcher to observe if there lies any development sequence among children aged 2 to 4 in terms of productivity of verbs and inflections. Besides, some graphical representations are also given

to interpret the data more distinctly. Overall, the analysis is carried out by also connecting the existing literature in the field of child language development.

### **Obstacles Encountered**

In the day care centre *X*, the researcher has not managed to collect data from more than one child. The authority, even providing the permission initially, has not let the researcher continue to collect data any longer. Besides, in case of the day care centre *Y*, the problem has been with the distance. It is time consuming to reach there on the days of data collection. Apart from these, the researcher's supervisor has acquaintances in the day care centre *Z*. As a result, little amount of problems are faced by the researcher there. However, their fixed schedule has not permitted the researcher to collect speech sample of more than 2 children per day.

### Analysis

In this chapter the researcher presents the data which have been collected from 30 children aged 2 to 4. They are pre-school children from 3 different day care centres in Dhaka. The researcher collects spontaneous speech samples of 20 minutes through play sessions with each child. This chapter first presents the data that show children's productivity of verb stems. Afterwards, data showing children's productivity of inflections have also been presented.

#### Measuring Verb Productivity

To what extent a child uses verb stems and verb inflections within a given age, can be identified by measuring productivity. For this, the use of a verb stem with at least two inflections, and the use of an inflection with at least two verb stems, can be considered productive (Pizzuto & Caselli, 1994). Following such criteria, it is generally possible to find out how productive a child is in a particular age. Thus measuring the productivity can indicate how children acquire certain features of linguistic elements.

This section examines the productive use of verb stems in different verb forms for each child. Table 1 carries every verb stem that a child has produced. Besides, it shows the frequency of using a specific verb stem. It is to be noted that the same verb stem carrying different inflections has been considered a different item in each case. For instance, in case of the child 15 (2.11), 7 different forms of the verb stem *de* or *to give* can be identified. These are: *dei, dibo, dichchi, day, dieche, dibe, dichche*. Therefore, for this particular verb stem *de* or *to give*, the researcher tallies 7 different forms, as she considers that the child has used this particular verb stem in 7 different forms. Similarly, for 30 children, from table 1, a total of 57 verb stems can be identified. Hence, table 1 covers for each child, the verb stems along with the number of different forms of verbs.

Table 1

*Verb Stems and Their Frequency for Each Child*

Verb Stems	Children																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Ach(to have)	1	2	1	1			1			1	1		1		1	2					2	1									
Thak(to stay)		2	1			1	1		4		2	1		1		3	3	1	1				1	2	1	3		2	2	2	
Bosh(to sit)		2		1					1		1			1	3		3	1	4	2	1	1	1	2		1		1	3		
Dekh(to see)		2					2		1		1		1		1	1		2	2	2	2	1	1	2	2	4	1	1	1		
De(to give)		3	1	3	1	4	4	1	3	2	4	5		2	7	1	6	1	2	3	5		2	2	3	3	4	6	5		
Khul(to open)		1				1			2	1				1	1		1	4	3	1	2		1		3	3					
Ne(to take)		1	1		2	1			1		1	2	1		2		2						2	1							
Kha(to eat)		2	2				2		3	2	4	2	3		4	1		1		1	3	1	3	2	1			2			
Ho(to be)		1	1		1				1		1	3		1		1	2		2	2	2	1	2	3	2		2	2	2	4	
Ash(to come)			3			1	2				1				1	1	2			2	1					1	1	4	2		
Ja(to go)			2				3		1	1	2	2			2	3	4	1		2	1		2	1	5	1	2		2	3	
Kat(to cut)			1		1	1	1		1	2	3	1	1		4	3	2	3		1	1		3	1		2	3	2			
Ak(to draw)			1																												
Rakh(to keep)				1			2		3	1	3	3	1	1	3	3	5	6	5	3	1		6	6	4		5	2	2	4	
Bol(to say)				1						1					1		2						1		2		1				
Chol(to drive)				1			1		1	1	1		3		1	1	1	2			2				1	1		2	3		
Kor(to do)				1		1	1	1			2	1	1	2	3	1	4	3	2	3	2	1	4	2	6	3	3	3	1	2	
Khel(to play)						1				1					1	1				1	1		2	1				2	3	1	
Dhuk(to enter)						1			1								3			1		1	1	2		1	1			1	
Dara(to stand)							2								1		1											1			





Table 2

*Number of Productive Verb Stems for Each Child*

Children (Age)	Number of Productive Verbs	Children (Age)	Number of Productive Verbs
1 (2.0)	0	16 (3.0)	5
2 (2.0)	6	17 (3.0)	14
3 (2.1)	3	18 (3.0)	8
4 (2.1)	1	19 (3.1)	9
5 (2.1)	1	20 (3.1)	9
6 (2.2)	1	21 (3.2)	9
7 (2.3)	7	22 (3.3)	0
8 (2.4)	0	23 (3.3)	11
9 (2.4)	5	24 (3.4)	10
10 (2.5)	4	25 (3.4)	8
11 (2.8)	8	26 (3.7)	6
12 (2.9)	6	27 (3.9)	9
13 (2.10)	2	28 (3.9)	10
14 (2.10)	2	29 (3.11)	11
15 (2.11)	9	30 (4.0)	6

Here, around 10% of the total sample does not show any productive use of any verb stems, and another 10% shows productive use in case of only one verb stem. Besides, 20% of the children show productive use of 2 to 5 verb stems. The rest 60% uses above 5 different verb stems as productive stems. It can be observed that the lowest number of productive verb is 0, and the highest number is 14.

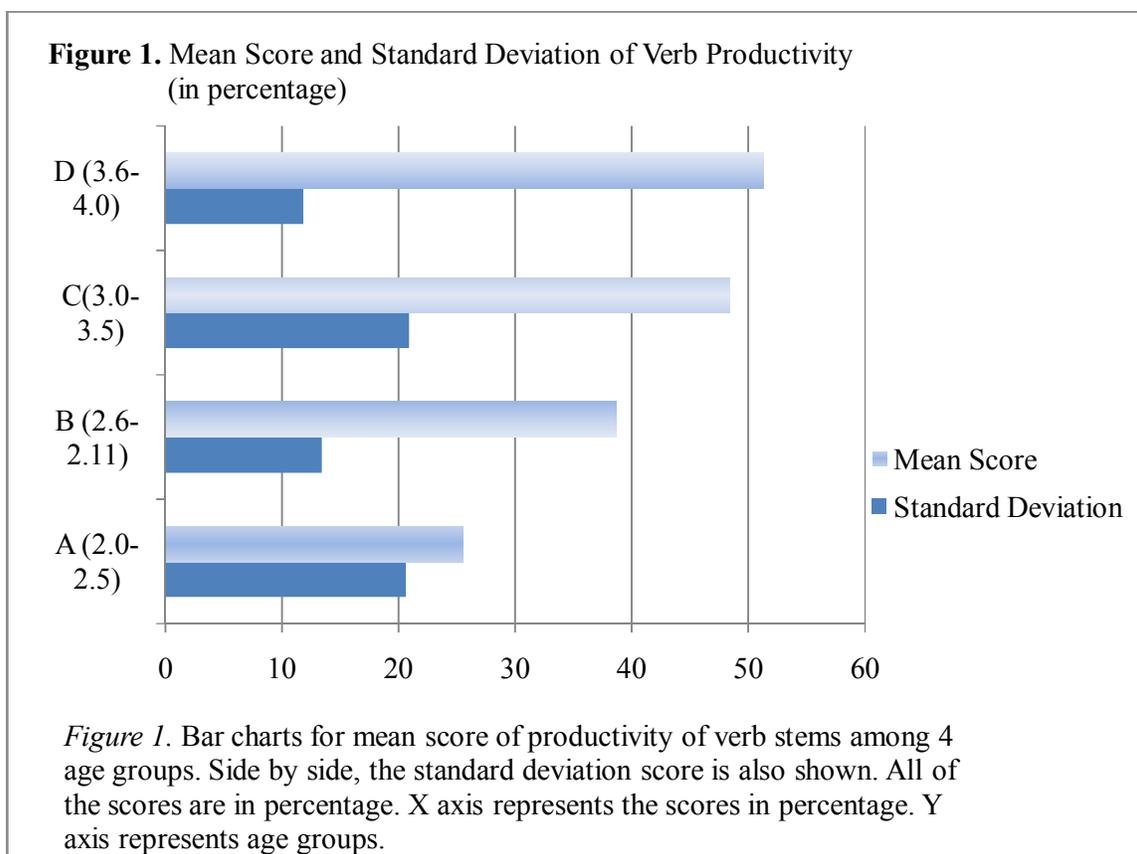
Table 3

*Mean Score of Verb Productivity of Age Groups*

Groups	Number of Children	Age Range	Mean Score	Standard Deviation
A	10	2.0 to 2.5	2.8	2.6
B	5	2.6 to 2.11	5.4	3.3
C	10	3.0 to 3.5	8.3	3.7
D	5	3.6 to 4.0	8.4	2.3

From tables 1 and 2, it can be seen that there is an increase in number of productive verb stems along with the increased age of the children. This particular aspect can be more specifically demonstrated through group findings. By dividing the sample into 4 different age groups, table 3 provides the mean score of verb productivity for each group. This presentation shows the gradual increase of mean scores among these age groups.

Furthermore, the researcher closely focuses on the use of productive verb stems in case of individual child. The total percent of productive stems within one's speech sample is calculated. Afterwards, she takes a holistic account by calculating the mean scores and standard deviation for each age group. Figure 1 demonstrates the mean score and standard deviation, in percentage, of verb productivity across age groups.



Tables 1, 2, 3 and figure 1 demonstrate the productivity of verb stems for the children.

### Measuring Inflectional Productivity

This section studies the productive use of different inflections for each child. Table 4 carries all the inflections involving person, tense and aspectual information for each child. Besides, it shows the frequency of using a particular inflection. It is to be noted that the same inflection used with different verb stems has been considered a different item in each case. For instance, in case of the child 15 (2.11), the simple future inflection *bo* has been used with 6 different verb stems. These are: *boshbo*, *rakhbo*, *dibo*, *khulbo*, *banabo*, *katbo*. As a result, for this particular inflection *bo*, the researcher tallies 6, by considering that the child has used this particular inflection with 6 different verb stems. Similarly, for 30 children, table 4 covers the inflections along with the number of different use of those inflections.



Children	Simple Present			Present Progressive			Present Perfect			Simple Future			Past Perfect			Past Progressive			Imperative
	i	o	e	chi	cho	che	echi	echo	eche	bo	be	be	echilam	echile	echilo	chilam	chile	chilo	
16	2		7	2		2			4	3		1	1						1
17	6	2	11		1	2	1		2	6	1	8							5
18	7		8		1		1		3	3		2							8
19	4		5	2					2	6		2							4
20	3		9						3	3		4							4
21	2		14	1			2		1			1			1	2			4
22			5																1
23	6	1	9	1			3	1	3	6	1	1							7
24	4		5						1	6	1	6	1						1
25	6	2	2	1	1	2		1	1	4	3								2
26	1		9	2	1	1		1		3	2	5							2
27	3		5	1	1	4	1		2	4	2	6							6
28	9	1	6	1		2	1	1	1	7	2	1							2
29	5	1	9	4			1		1	3	3	3							2
30	2		5	1		2	1			2	2	4							

Similar to measuring the verb productivity, the researcher again adopts the productivity criteria (Pizzuto & Caselli, 1994). According to these criteria, a particular inflectional form will be productive if the same inflection is used with at least two different verbs. Therefore, the researcher has counted only those inflections which are used with at least two distinct verbs. Table 5 presents the number of productive inflections for each child.

Table 5

*Number of Productive Inflections for Each Child*

Children (Age)	Number of Productive Inflections	Children (Age)	Number of Productive Inflections
1 (2.0)	0	16 (3.0)	6
2 (2.0)	4	17 (3.0)	8
3 (2.1)	3	18 (3.0)	6
4 (2.1)	2	19 (3.1)	7
5 (2.1)	1	20 (3.1)	6
6 (2.2)	3	21 (3.2)	4
7 (2.3)	6	22 (3.3)	1
8 (2.4)	0	23 (3.3)	6
9 (2.4)	5	24 (3.4)	4
10 (2.5)	3	25 (3.4)	7
11 (2.8)	6	26 (3.7)	6
12 (2.9)	5	27 (3.9)	8
13 (2.10)	3	28 (3.9)	6
14 (2.10)	2	29 (3.11)	7
15 (2.11)	9	30 (4.0)	6

From table 5, it can be seen that 7% of the total sample does not show any productive use of verb inflections. Similarly, another 7% has used only one inflection productively. Besides, 36% of the children use 2 to 5 inflections productively. Finally, the rest 50% uses more than 5 inflections in a productive manner. The lowest number of productive inflections is 0, and the highest number is 9.

Table 6

*Mean Score of Inflectional Productivity of Age Groups*

Groups	Number of Children	Age Range	Mean Score	Standard Deviation
A	10	2.0 to 2.5	2.7	2.0
B	5	2.6 to 2.11	5	2.7
C	10	3.0 to 3.5	5.5	2.0
D	5	3.6 to 4.0	6.6	0.9

From tables 4 and 5, it can be seen that there is an increase in number of productive verb inflections along with the increased age of the children, except with some exceptions. This particular aspect can be more specifically demonstrated through group findings in table 6. It provides the mean score of verb inflections for each group. This presentation shows the gradual increase of mean scores among these age groups.

Tables 4, 5 and 6 have demonstrated the productivity of verb inflections for the children.

## **Discussion**

This chapter deals with the interpretation of the findings of this present study. The researcher puts forward her findings into the context of item based approach, proposed by Tomasello (2000a). By referring to previous research, she presents whether her findings agree or disagree with the existing research. Finally, this chapter also shed some light on the fact whether this study has any consistency with the knowledge in the field.

### **Addressing the Central Research Questions**

The central research question 1 investigates if Bangla speaking pre-school children aged 2 to 4 adopt an item based or productive approach in terms of acquiring different verb forms. It is to be mentioned that item based approach claims that the early language of children is based on some item based structure with highly specific slots (Tomasello, 2000b). It further mentions that in case of verbs, each verb will be used following a unique set of “utterance-level-schemas” which will gradually be used in novel utterance-level-schemas, across developmental time (Tomasello, 2000b, p. 68). In their study, Pizzuto and Caselli (1994) demonstrate how learners adopt a productive approach in case of the acquisition of verbs in Italian language. The present study also looks for elements whether they could suit to such claim.

From tables 1, 2 and 3, a gradual increase in number of novel verb stems, used by the children, can be seen. Even though the mean score among groups also has a gradual increase, the standard deviation indicates diversity. This phenomenon is particularly visible in case of groups *B* and *C*, whose standard deviation are 3.3 and 3.7 respectively. This particular outcome is probably for the talkative nature of the child 15 (2.11), and the child 17 (3.0). The number of productive verb stems for them are 9 and 14 respectively, which are high in numbers compared to other children of the groups.

On the other hand, the same condition can also be investigated from different aspect. In case of group *B*, 2 of the children, 13 (2.10) and 14 (2.10), produce only 2 verb stems productively, which is much lower compared to other children from the same group. Similarly, in case of group *C*, one of the children, 22 (3.3) does not show any productive use of verb stems at all. Otherwise, the findings would have been more consistent and less diversified. Apart from these, in case of both child 1 (2.0) and child 8 (2.4), there are no use of any verb stems with more than 1 inflections, and vice versa. Therefore, they have not yet met the productivity criteria (Pizzuto & Caselli, 1994).

In order to investigate the verb productivity more closely for each child, the researcher finds out what percent of his/her total used verbs carries productive verb stems. Then, the mean score and standard deviation of those percentages are calculated for each age group. Figure 1 demonstrates the mean score and standard deviation, in percentage, of verb productivity. It can be seen that the mean score of verb productivity gradually increases across the age groups.

Again, the central research question 2 focuses on the nature of productivity in Bangla-speaking children aged 2 to 4, in case of acquiring verb inflections. In case of inflection productivity, from table 6 it can be seen that there has been minimal increase from group *C* to group *D*, in terms of mean score. One of the key findings of this research is the fact that the increase rate plateaus after a certain point of age, in both the cases of verb and inflectional productivity. To illustrate, from table 2 it can be seen that the child 17 (3.0) has shown the highest amount of verb productivity by having the score of 14. Again, from table 5, the child 15 (2.11) has shown the highest amount of inflectional productivity with the score of 9. After these certain points, there does not seem to be any increase in number of use of productive verb forms or inflections, by other children.

By addressing this aspect, the researcher proposes two explanations for such phenomenon. Firstly, it is to be noted that by the increasing age, children get to be exposed to higher number of vocabulary items. Therefore, they can get options to use other verb stems instead of using the same stem repeatedly. They may not show productivity according to the criteria (Pizutto & Caselli, 1994), however, their use of various verb stems shows how developed their knowledge of vocabulary is (please see Table 1). It might also be the case that since these verbs are rarely used, it is unlikely to use them in more than one form (Aguado-Orea & Pine, 2015). Hence the researcher proposes that the total number of used verb forms for each child, irrespective of productivity, can indicate that the children gradually learn to use many verb forms, based on the context. This might be one of the reasons that from child 17 (3.0) onwards, there is no increase in terms of verb productivity.

The other explanation that the researcher suggests deals with the idea of frequency. A close observation of table 1 indicates that the younger children, preferably age 2 to 3, are mainly productive with those verbs which are highly used in daily life. On the other hand, children aged 3 to 4 are using some less frequent verb forms, along with the high frequent ones. Being a Bangla speaker herself, the researcher's instinctive tendency could tell which frequently used verbs are.

This explanation can be implied in both the cases of verb productivity and inflectional productivity. In case of inflectional productivity, table 4 shows that children tend to use inflections which indicate simple present, present perfect and future tense. They also frequently use imperatives. Nonetheless, inflections referring to past tense are less used by the children. They also do not show noteworthy use of progressive markers in early age. This might be due to the fact that the knowledge of grammatical system builds up step by step in piecemeal fashion, where there is a sequence to move from simple towards complex

structures (Ellis, 1985). Besides, lack of proper context to use such forms can also be another reason.

From table 4, it also appears that the person markers that the children use are mostly 1st person and 3rd person. The use of 2nd person marker becomes evident from the child 17 (3.0) onwards, where some of them have used 2nd person marking inflections more than once. Apart from these, some exception could also be seen from table 4, where there are only 2 children, 16 (3.0) and 21 (3.2), who used inflections referring to past tense.

### **Further Points to Discuss**

Apart from the above mentioned interpretations, there are certain specific issues that need to be addressed. One of the interesting findings of this study is that a high percentage of children, around 70% of total, use only 1 form, in half or more than half of their used verbs (see Appendix B for further proof). This further ensures that young children do not master the whole verb paradigm for all verbs at once; rather they acquire it gradually (Tomasello, 2000b).

Besides, there are a limited number of inflections that have been used with limited number of verbs in case of very young children. These findings possibly confirm the verb-island hypothesis, which claims that young children cannot transfer their existing item based constructions to any novel item until they hear those items used in adult discourse (Tomasello, 2009). Therefore, young children cannot generalize across contexts, and hence, apply their existing knowledge for different verbs on a one-by-one basis.

Furthermore, the analysis affirms the fact that Bangla speaking children certainly can use person markers from early age. This is due to the very nature of the language, since Bangla does not have any verbs with bare stems. However, children's use of person markers varies to the degree that they can process and apply their knowledge. Study shows that Italian children use person markers at very early stage, especially first person markers (Guasti,

1993). From the present study, it emerges that there is a possibility of following a trend while acquiring person markers. Children use 1st person, 3rd person and at a later period of age, they acquire 2nd person markers. This developmental sequence can be due to several facts. Firstly, in order to use these person markers separately based on different verb forms, a child needs to understand the differences among different persons. In this respect, research shows that one of the most important steps in cognitive development of children is to understand the difference between the “self” and the “rest of the world” (Schmalstieg, 1977, p. 72). For young children, it might become difficult to do so due to their immaturity, hence, they mostly use 1st person markers initially. On the other hand, the 3rd person marker is commonly used in regular conversation in any language. For this reason, participants might use 3rd person marker frequently.

Apart from these, it needs to be taken into account that age is the only factor that the researcher focuses on. Nonetheless, there are other factors that can affect the children’s productivity. Some other variables may include family members, social standing of their parents, interaction among parents and child etc. The environment in which the child grows up may also have impact. The frequency of input for each child is not controlled in this study. For instance, if the parents are educated, and tend to spend time with their children by talking or reading story books, children can become productive. Surrounding environment can affect children’s vocalization and verbalization patterns as well (Bornstein et al., 2000). One of the ways of taking such factors into account is to examine individual differences among children with a relation to their development of linguistic elements (Lustigman, 2012). In this respect, research shows that productivity may be even more affected by the conversational partners of child; rather by different social contexts (Bornstein et al., 2000). Learning can occur when an individual interacts with an interlocutor within his or her zone of proximal development (ZPD) (Lightbown & Spada, 2006). However, by claiming that individual differences are of

only “marginal interest”, some propose to focus on social and environmental factors where individual or locales can change children’s preferences (Bornstein et al., 2000, p. 408).

Apart from these social factors, there can be some linguistic characteristics that have effect on the child on becoming productive. These aspects include phonological regularity of sounds over other, “greater facility” with aspect over tense, and familiarity of high frequency verbs over low frequency verbs (Hohenstein & Akhtar, 2007, p. 862). It is to be noted that the inappropriate use of inflections by children might not indicate that they have not acquired grammatical categories; rather it may be due to their incomplete or partial understanding of when and how to use these linguistic elements (Hohenstein & Akhtar, 2007). Children’s limitations in the use of verb inflection therefore do not reflect limitations of the productivity of their knowledge of verb inflection. Besides, naturalistic speech samples occur so infrequently that it allows children to produce verbs with only one of a range of possible inflections (Aguado-Orea & Pine, 2015).

This study observes that children are not fully productive initially with the knowledge of verb inflection. Nonetheless, it must not be assumed that such findings indicate children’s knowledge any unanalyzed. It is possible that there lies a gray line between knowledge being unanalyzed and knowledge being productive. There can also be a possibility that even though children have the ability to use all inflections productively to some extent; the knowledge of particular inflections may be less than full productive (Aguado-Orea & Pine, 2015).

Hence, rather than taking two extremes as “binary distinctions”, it can be considered that there lies a “continuous dimension”, when it comes to productivity in children’s speech (Aguado-Orea & Pine, 2015, p. 4). This dimension is a thread where from one point children start their journey and with progression acquire productivity gradually.

### **Conclusion**

In this study the researcher intends to figure out the answers of following questions:

- a) Whether children have a productive approach in terms of acquiring verb inflections? To illustrate, do children learn following *item-based approach*? (Tomasello, 2000a)
- b) What is the nature of productivity in Bangla-speaking children aged 2 to 4, in case of acquiring verb inflections?

To explore the answers of these questions speech samples of 30 pre-school children are used to analyze. The use of only simple verbs has been taken into account.

### **Summary of the Findings**

The findings of this research identifies that the children follow an item-based approach, in terms of acquiring verb inflections. There is a significant increase along with the increased age. Nonetheless, at one point of time, children do not show significant productivity, perhaps due to their expanded linguistic knowledge, disinterest to participate etc.

### **Contribution to Research**

This dissertation can hold of attention to the researchers who are interested working on Bangla child language development. Besides, since this study presents findings from speech of 30 typically developing children, it can also be considered one of the inventories for future use. Moreover, it may also help language therapists who work with children having language disorder. With the help of this study, a comparison between typically and atypically developed children can be identified, which may help the therapists to work more efficiently.

**Practical Implication**

The readers are expected to get to know the fashion in which Bangla speaking children acquire verb inflections. The parents can get the idea how their conversation with their children might enrich the knowledge of vocabulary items of their children.

**Recommendations**

This study shows consistent results in both the cases of verb productivity and inflectional productivity. It also addresses some exceptions that further give the findings more validity. However, the overall findings will recommend some suggestions, which are:

- future studies can include other verb forms, like complex and conjunct, to explore the array of acquisition of Bangla verb inflections
- other productive criteria can also be taken into account, since that can provide with more dynamic findings.

**Further Studies**

This study focuses solely on simple verb forms. Future studies can also explore the acquisition of complex and conjunct verb forms.

**Conclusion**

Different sorts of processing abilities may determine the development sequence of different linguistic features (Lightbown & Spada, 2006). Research on English morphology shows that children tend to produce verbs in present progressive in high percentage (Conti-Ramsden & Windfuhr, 2002). This study has also showed findings for Bengali verbs. However, since verbs are changeable along with changing person, the process of acquiring verb inflections along with different person markers, ask for more processing capacity.

Moreover, this study addresses some exceptions in the findings. One of the reasons, as Eisenbeiss (2010) mentions is the 'lack of appropriate context', for which children do not

show productivity of certain linguistic elements (p. 2). Therefore, the presence or absence of a certain linguistic element must not always respectively mean that children have or have not acquired the linguistic constructions (Eisenbeiss, 2010).

To conclude, this study has certain limitations. The researcher would like to acknowledge that the current findings are based on natural speech sampling. Future studies can include other instruments to further strengthen the findings. Besides, present sample size is small which could limit its generalizability. A larger sample can give comparable data allowing generalization.

In case of verb inflection, it cannot be claimed that the knowledge of it will be productive from the very beginning since one need to explicitly learn how verb stems and verb inflections work (Aguado-Orea & Pine, 2015). Therefore, Bangla speaking pre-school children use verb inflections in a smaller scale at the very early age. Through the exposure, they gradually become efficient in using verb inflections productively.

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## Appendix A

Table on Verbal System of Bangla Language (Chatterjee, 2014, p. 50)

Table 1

*Verbal System of Bengali*

Bangla Verbs	Subtypes	Components of Verbs	Example of Each Type
Simple		1 Verb	<i>lekha</i> or <i>to write</i>
Complex	Conjunct	Noun+do	<i>ranna kora</i> or <i>to cook</i>
		Noun+do+Verb	<i>jiggesh kore neowa</i> or <i>to ask someone for oneself</i>
	Compound	Verb+Verb	<i>ghumiye pora</i> or <i>to fall asleep</i>

*Table 1 Verbal system of Bengali (adapted from Chatterjee 2014: 47-62)*

## Appendix B

Table 2

*The Percentage Ratio of Using One Verb Form Once*

Children	Single-Used Verbs (in %)	Children	Single-Used Verbs (in %)	Children	Single-Used Verbs (in %)
1	100	11	53	21	57
2	33	12	45	22	100
3	70	13	75	23	45
4	85	14	75	24	38
5	75	15	59	25	39
6	88	16	71	26	63
7	53	17	42	27	53
8	100	18	50	28	52
9	68	19	25	29	31
10	73	20	50	30	45