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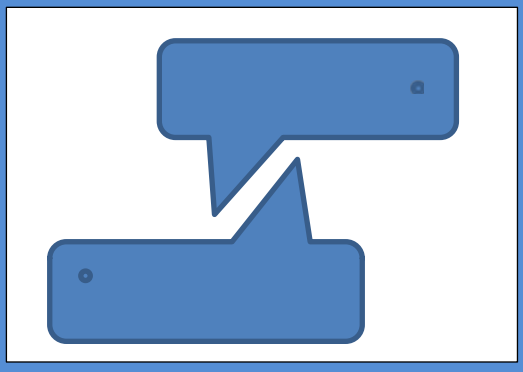

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Productivity of Verb Stems and Inflections in Bangla-Speaking Children[1]

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Abstract

The study examines the nature of productivity within the verbal paradigm among typically-developing Bangla-speaking pre-school children. Spontaneous language samples of 30 typically-developing children aged 2 to 4 were collected. Productivity of the verb stems and inflections were calculated based on a specific criterion. The results revealed that the children followed an item-based approach, in terms of acquiring verb stems as well as inflections. The findings, we propose, can guide the future studies, especially those working on child language development in Bangla.

Keywords Bangla, Bengali, child language, productivity, verb inflections

1. Introduction

The acquisition of verb inflections has been a widely-investigated field of research in child language development. While cross-linguistic findings are available on a variety of languages (e.g. Aguado-Orea & Pine, 2015, Spanish; Brandt, Verhagen, Lieven, & Tomasello, 2011, German; Pizzuto & Caselli, 1994, Italian; Lustigman, 2012, Hebrew; Tomasello, 2009), findings on Bangla verb acquisition are limited (e.g. Chakraborty & Leonard, 2012; Sultana, Stokes, Klee, & Fletcher,2016; 2019).

The nature of productivity exhibited by children in learning the verbal system in Bangla was examined in the present study. Young children were often claimed to follow an 'item-based' approach in learning the verbal paradigm where they gradually moved from using fixed stem-and-marker combinations to a flexible use of these combinations (Tomasello, 2000a). According to the 'item-based' approach, children were often found to use a set of inflections only with specific verbs, and a set of verb stems only with

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specific inflections. This phenomenon was examined across languages (see Tomasello, 2000a for a review), and the findings reinforced the claims.
Bangla, an Indo-Aryan language spoken among 250 million people as their first or second language (Comrie, 2005, Klaiman, 2008), remains largely unexplored in its investigation of child language development. There have been a few recent studies that examine the development of the verbal paradigm in Bangla-speaking children (Chakraborty & Leonard, 2012; Sultana et al., 2016; Sultana et al., 2019). However, since all of them investigate language acquisition in terms of mastering individual inflectional markers, the productivity of the items remain unexplored. The present study examines the item-based approach with regard to Bangla child language data. The specific questions asked in this study are:

a) Do children follow an 'item-based' approach towards the acquisition of Bangla verb paradigm (Tomasello, 2000a)?

b) What is the nature of productivity in Bangla-speaking children aged 2 to 4 with regard to acquiring verb inflections?

1.1 Productivity

Productivity is the use of a particular expression in a frequent and creative way (Lust, 2006). To illustrate, a child acquires the productivity of a particular linguistic item when s/he can use it in a greater variety, and when s/he knows how to transfer from the item-specific to the item-general use of it. Three processes are associated with productivity—segmentation, categorization, and recombination (Brandt, et al., 2011). Even before being productive, children tend to segment and recombine 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, Fasolo, Cassibba, & Costantini, 2011). Productivity of verbal inflections includes not only the addition of inflections to verb stems but also the dropping of inflections from verbs in appropriate syntactic contexts (Hohenstein & Akhtar, 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). By the same principle, rote-learned items do not showcase productivity since they 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 since such utterances do not reflect children's knowledge of the linguistic rules (Brandt et al., 2011). A series of experimental studies conducted following the research design of the 'wug test' (Gleason, 1958) indicated that children between age four to seven had the knowledge of the underlying morphosyntactic rules, and therefore had productivity (Gleason, 1958), while children below age three largely depended on stem-specific knowledge (Tomasello, 2009).
Productivity in children's language was examined crosslinguistically in relation to the use of specific utterance patterns as well as in their use of

inflections. In a distributional analysis of English-speaking children's language (1;0- 3;0 years) it was reported that children's early utterances did not reflect any general underlying patterns; instead those were constructed around specific verbs (Lieven, Pine, & Baldwin, 1997). Based on their examination of specific inflections and sentence patterns, they argued in support of an item-based approach claiming that children's utterances developed initially in unanalyzed segments which gradually children learned to disintegrate and generalize in other contexts. Similarly, Spanish-speaking children's (1;6- 2;6 years) use of verb morphology revealed that the inflected forms were specific to verb stems, and mastery of the inflectional system developed in a piecemeal fashion (Gathercole, Sebastian, & Soto, 1999). In an attempt to identify a cut-off point when the item-based language became a broad-based system, it was suggested that the system changed continually by adding 'drops' which eventually became the 'river' (p. 160- 161). While examining mother-child conversations, the study also suggested that the frequency of the input was not the only determining factor in the use of the 'segments'; forms with linguistic advantages such as structural and cognitive simplicity emerged earlier than frequently used complex forms.

1.2 The Item-Based Approach

An item-based approach suggested that children initially learn "concrete linguistic expressions" through imitation, and only later they use their "general cognitive and social-cognitive skills" to "categorize, schematize and creatively combine" individually learned expressions and structures (Tomasello, 2000a, p. 156). 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 stages of child language development. In such cases, the use of certain verb forms may occur without assigning them to relevant inflectional categories (Lustigman, 2012). Similarly, a study showed that children observed patterns of language used in the environment and gradually, sometimes one verb at a time, formed hypotheses about the underlying rules that eventually changed through their cognitive and social maturity (Owens, 2014). Therefore, the development of verb inflection was suggested to be a gradual process that included "probabilistic learning and generalization", as opposed to the claim that there occurred an "instantaneous mapping" of inflections to particular cells which were in a pre-given paradigm (Aguado-Orea & Pine, 2015, p.18).

According to Ellis (1985), the "incremental nature" of first language acquisition could be distinct in two ways: at utterance level and at grammatical level (p. 46). In case of the utterance level, a gradual increase in the length of children's utterance was suggested. By constant revision of grammatical rules, children generated structures which gradually became adult-like (Ellis, 1985).

Lust (2006), however, confronted this theory by posing several issues. She suggested that the theory needed to clarify the specific mechanisms that offered children to convert from an individual item to a generalized pattern. She further questioned the means in which children determined "similarity"

across construction in order to construct proper generalization without linguistic analyses (p. 68).

1.3 The Verb Island Hypothesis

The verb island hypothesis claims that 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. A study conducted on Italian-speaking children showed young children's limitation in using inflectional markers; approximately half of the verb forms used by the children were in one inflectional form only, and another 40 percent of the verbs were used only in two or three inflectional forms. Also, the verb stems that were used in four or more inflectional forms were reported to be 'irregular, highly frequent verbs' which were likely to be results of rote-learning (Pizzuto & Caselli, 1994, p. 163).

Depending on the usage that one child gets to observe, specific verb island constructions are established in varied degrees (Tomasello, 2009). For example, children use verbs only in ways they have heard them used until they have enough experience with different verbs (Hohenstein & Akhtar, 2007). Children's acquisition of productive knowledge of inflectional morphology is a gradual process where the non-productive early use of verbs gradually gets replaced by inflectionally more elaborated forms (Lustigman, 2012). However, it is also argued that the hypothesis takes into account the syntagmatic constraints regarding the grammatical agreement that are only confined to highly familiar lexemes (Brandt et al., 2011; Lustigman, 2012). Only high frequency verbs potentially support the development of verb-specific schemas, and therefore, how the rote-learned forms face a shift towards more specific forms still needs to be analyzed for low-frequency stems.

1.4 An Overview of Bangla Verb Morphology

Bangla (Bengali) is an Indo-Aryan language that exhibits a range of inflectional markers in the verbal paradigm. Bangla verbs bear markers for tense, aspect, modality and person, but not for gender and number (Bhattacharya, Choudhury, Sarkar, & Basu, 2005) (Table 1). The verb agreement feature is demonstrated in three person forms, i.e. 1st, 2nd, and 3rd person (Mondal, 2014).

Bangla is considered morphologically-rich since a verb root can take more than 50 different forms (Dasgupta & Ng, 2006). Therefore, the diversity that Bangla morphology offers may cause a possible difficulty for a child to process varied choices while acquiring several verb forms. However, the Bangla verb inflectional system exhibits a considerable amount of transparency and regularity which possibly has contributed to a high accuracy rates of verb inflections use (Chakraborty & Leonard, 2012).

Bangla language has predominantly two types of verbs: simple and complex verbs (Chatterjee, 2014). Complex verbs are often subdivided into two categories, conjunct verbs and compound verbs (Bhattacharyya, Chakrabarti & Sharma, 2006; Bhattacharja, 2010). A detailed table of the verb

morphological pradigm in Bangla is given in Appendix A. Since there is no direction available in literature regarding the analysis of conjunct and compound verbs, it is difficult to draw any conclusion regarding the productivity exhibited in the acquisition of these two verbs. Hence, only the simple base verbs were included for analysis in the present study.

Table 1
Verb inflectional system in Bangla

	1st person	2nd person	3rd person
Present Simple	(Ami) por - I stem- 1p (I) read.	(Tumi) por - o stem- 2p (You) read.	(She) por - e stem- 3p (He/she) reads.
Present progressive	(Ami) por - chʰ- i stem- prog- 1p (I) am reading.	(Tumi) por - chʰ- o stem- prog – 2p (You) are reading.	(She) por - chʰ- e stem- prog - 3p (He/she) is reading.
Present perfect	(Ami) por - echʰ- i stem- perf - 1p (I) have read.	(Tumi) por - echʰ- o stem- perf - 2p (You) have read.	(She) por - echʰ- e stem- perf - 3p (He/she) has read.
Past simple	(Ami) por - 1 - am stem- past- 1p (I) read.	(Tumi) por - 1 - e stem- past - 2p (You) read.	(She) por - 1 - o stem- past - 3p (He/she) read.
Past progressive	(Ami) por -chʰi - 1 - am stem-prog -past- 1p (I) was reading.	(Tumi) por- chʰi- 1 - e stem- prog -past-2p (You) were reading.	(She) por- chʰi - 1 - o stem-prog-past-3p (He/she) was reading.
Past perfect	(Ami) por- echʰi - 1- am stem- perf - past- 1p (I) had read.	(Tumi) por- echʰi- 1 - e stem- perf - past-2p (You) had read.	(She) por- echʰi - 1 - o stem-perf-past-3p (He/she) had read.

Note: Adapted from Sultana, 2016.

2. Methodology

2.1. Participants

A group of 30 pre-school children aged 2 to 4 (M = 2.8, SD = 0.6) participated in the study. There was a 47: 53 ratio between the female (n= 14) and the male (n= 16) participants. They were recruited from three daycare centres in Dhaka. The authors relied on the caregivers' reports for the identification of the children as typically-developing.

2.2. Instruments

Although spontaneous language samples often fail to obtain specific linguistic forms (Lust, 2006), the authors used this method because the language evidence collected through a spontaneous set-up is considered to be a better representation of children's language. Also, spontaneous samples

are recommended in contexts where adequate directions for investigations are not available (Eisenbeiss, 2010).
Considering these, spontaneous language samples were collected during a 20 minute freeplay session with each participant. To maintain uniformity in the environmental setting, the first author played with the participants using a fixed set of toys that included a house set, a cooking set, a food set, some animals and a stethoscope.

2.3. Setting and Procedure

The consent of participation was obtained by submitting a formal letter of request to the in-charge of the daycare centres. Before collecting each 20-minute language sample, the first author spent around 10 minutes to be acquainted with the child. A pair of digital cameras and a stopwatch were used to record the sessions. The freeplay sessions took place in the respective daycare centres.

2.4. Data Analysis

The collected video recordings were transcribed by the first author. In order to examine the productivity of verb stems, the authors calculated the verb stems along with the number of different verb forms for each child. The examination of productivity of inflections was done by calculating the inflection marker combinations across the samples. Descriptive statistics (mean, SD) were reported for analyzing the productivity of both verbs and inflections.
The determination of productivity of a verb stem was made using the criterion that a stem was considered productive when it was used with at least two different inflections. Similarly, a verb inflection was considered productive when it was used with at least two different stems (Pizzuto & Caselli, 1994).
In order to assess children's development with age, the participants were divided in four groups: 2;0 to <2;6 years (group 1), 2;6 to < 3;0 (group 2), 3;0 to <3;6 (group 3), and 3;6 to 4;0 (group 4). The purpose of the grouping was also to identify if there is any development sequence among children aged 2 to 4 in terms of productivity of verbs and inflections.

2.5. Theoretical Framework

The spontaneous speech samples were examined in light of the item based approach (Tomasello, 2000a). The samples were also examined to determine whether they match the claim of verb island hypothesis (Tomasello, 2009).

3. Findings

To what extent a child uses verb stems and verb inflections within a given age, can be identified by measuring productivity. In order to measure the morphological productivity, the authors used the productivity criteria proposed by Pizzuto and Caselli (1994): a stem is considered productive if it appears in at least two distinct inflected forms, and an inflectional marker is productive if it is used with at least two different stems (Pizzuto & Caselli, 1994).

3.1. Verb Productivity

In order to calculate the productivity of verb stems, same stems carrying different inflections were considered different items. For instance, in case of child 15 (2;11), seven different forms of the verb stem *de* (*to give)* were reported (*dei*, *dibo*, *dichchi*, *dey*, *dieche*, *dibe*, *dichche*). Table 2 presents the numbers of productive verb stems used by each child while the verb stems and their frequency of use by the participants are in Appendix B.

Table 2
Number of Productive Verb Stems for Each Child

Children (Age)	Number of Productive stems	Children (Age)	Number of Productive Stems
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

Around 10% of the total sample did not show productive use of any verb stems, and another 10% showed productive use in one verb stem. Besides, 20% of the children showed productive use of two to five verb stems. The rest of the 60% children showed productive use of more than 5 different verb stems. The lowest number of productive stems was 0, and the highest was 14. The increase in the productive stems with age was evident when the participants were divided into four age groups (Table 3). A one-way ANOVA run with Groups as independent, and number of productive stems as dependent variables found that the groups determined by age had a significant effect on productivity of stems ($F(3, 26)= 6.49$, $p = .002$).

Since the use of productive verb stems is also likely to be a function of vocabulary development, the percentage of productive verb stems, in relation to the overall use of verb stems, used by the four groups of children was calculated in order to see the developmental pattern in productivity. The results indicated a sharp increase till age 2;11 years (Group 2) which slowed down thereafter (Table 3).

Table 3
Verb Productivity by Age Groups

Group	No. of Children	Age Range	Range (Min-Max)	Mean Score	Standard Deviation	Percentage of Productive verb stems (Mean)
A	10	2;0 - <2;6	0-7	2.8	2.6	25.06
B	5	2;6 - <3;0	2-9	5.4	3.3	44.17
C	10	3;0 - <3;6	0-14	8.3	3.7	49.69
D	5	3;6 - 4;0	6-11	8.4	2.3	51.16

3.2. Inflectional Productivity

Using the criteria for productivity, i.e. an inflectional marker is considered productive when it is used with at least two different verb stems (Pizzuto & Caselli, 1994), the productivity of these markers was calculated. Note that the same inflection used with different verb stems was considered a different item in each case. For instance, in case of the child 15 (2;11), the simple future first person inflection *bo* was used with 6 different verb stems (*bosh**bo***, *rakh**bo***, *di**bo***, *khul**bo***, *bana**bo***, *kat**bo)***. Table 4 presents the number of productive inflections for each child.

Table 4
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)	5
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

Four children (7%) did not show any productive use of verb inflections (Table 4). Similarly, 7% children used only one inflection productively. Besides, 36% of the children used two to five inflections productively. The rest (50%) used more than 5 inflections productively. The lowest number of productive inflections was 0, and the highest number was 9. A gradual increase in the mean score of productive stems used by children divided in four age groups was found (Table 5). The older children had mastered the inflectional patterns in relation to a higher number of markers. A one-way ANOVA conducted with Groups of children as independent, and number of

productive markers as dependent variables indicated that the levels of productivity in the use of inflectional markers were significantly different with regard to Groups ($F(3, 26)= 5.57$, $p = .004$). The percentage of productive inflections used by the children revealed an increase from Group A to B (2;0- 2;11 years). However, a gradual decline among the two older groups was also noted (Table 5). This issue is discussed in the following section.

Table 5
Mean Score of Inflectional Productivity of Age Groups

Groups	Number of Children	Age Range	Mean Score	Standard Deviation	Percentage of Productive inflections (Mean)
A	10	2;0 - <2;6	2.7	2.0	46.64
B	5	2;6 - < 3;0	5	2.7	74.29
C	10	3;0 - <3;6	5.6	2.0	68.82
D	5	3;6 - 4;0	6.6	0.9	65.55

4. Discussion and Conclusions

The findings of the study were primarily interpreted in light of the item-based approach proposed by Tomasello (2000a).

The research question a) investigated if Bangla speaking pre-school children aged 2 to 4 adopted an item based or a productive approach in terms of acquiring different verb forms. Item based approach claimed that the early language of children was based on a set of item-based structures with highly specific slots (Tomasello, 2000b). It further mentioned that in case of verbs, each verb was used following a unique set of "utterance-level-schemas" which was gradually used in novel utterance-level-schemas, across the developmental time (Tomasello, 2000b, p. 68).

The study found a gradual increase in the number of productive verb stems used by children (Tables 2 and 3). However, the children varied widely in their performance, even within the same age group (Table 3). Because the number of productive stems could be a function of children's vocabulary development, factors affecting vocabulary development other than age (i.e. frequency) was likely to have contributed to the diversity in productivity.

In order to exclude the effect of vocabulary, percentage of productive verb stems was calculated for each child. The results indicated that younger children had a smaller set of verb stems that were productive (Table 3). Similarly, when the percentage of verb used once was calculated for each group, there was a consistent decline in the scores indicating that as children grew older, they began to be more productive with the verb stems that they earlier used only once (Appendix C). Based on the results it can be suggested that with age children's verb use becomes more productive, although the increase rate may vary at different points.

The research question b) focused on the nature of productivity in Bangla-speaking children aged 2 to 4 in relation to acquiring verb inflections. The results revealed that the mean number of productive verb inflections increased with age (Table 5). However, when the percentages of productive

inflections in relation to unproductive inflections were calculated, there was a decline in Groups C and D (Age 3;0 years onwards). This tendency was not found when the stem productivity was calculated. It is possible that productivity was not reflected in the same manner in stems and inflections. Also, note that the group of verb inflections included markers that were likely to have a hierarchy among them (see Sultana, 2015, for a discussion); some were more frequent, cognitively easier to master, and had wide linguistic contexts, while the others were limited in nature. For example, the youngest group's (A) inflection use and productivity were limited to using the present simple, future simple and imperative forms, whereas the older children also showed productive use of other morphologically more complex forms. This is why, the productivity of verb inflections was likely to be affected by the factors that caused the hierarchy in verb inflections.

The results also showed that, even when the mean numbers of productive items were calculated, productivity in both verb stems and inflections plateaued after a certain point of age (Tables 3 and 5). The increase slowed down between Groups 3 and 4 (from age 3;6 years). A possible explanation is: with age and developing vocabulary, children get options to use other verb stems instead of using the same stem repeatedly. This might result in higher numbers of stems that did not meet the productivity criterion (Pizutto & Caselli, 1994). For the inflectional markers, the number of markers is limited by nature. Also, not all markers can be found from conversational data. Therefore, productivity measured through the mean number of productive inflections is likely to slow down. Note that the older children showed productive use of almost all the inflectional markers that were commonly found in conversations (Appendix D). In addition, some forms do not naturally occur in conversations in high frequency (Aguado-Orea & Pine, 2015), due to which forms such as the past progressive and the past perfect did not possibly achieve productivity even in the oldest group.

The frequency effect was also reflected in children's use of verb stems. It was noted that the younger children (age 2 to 3 years) were mainly productive with high frequency verbs (Appendix B). On the other hand, children aged 3 to 4 were found to use less frequent verb forms, along with the highly frequent ones. The findings were in line with the verb island hypothesis claiming that children's mastery of the verb paradigm developed around specific frequently occurring verbs (Pizzuto & Caselli, 1994).

The general findings of the study were consistent with the claims of the item-based approach, i.e. children begin to use the verbal paradigm by manipulating the forms with specific verbs, and only with more exposure they learn to transfer the patterns onto a larger group of items. Similar findings were reported in many previous studies (e.g. D'odorico et al., 2011; Pizzuto & Caselli, 1994). However, neither the slowing down of productivity noted in the older group nor the decline in percentages of productive verb inflections were found in those studies. Pizzuto and Caselli did not report percentages of productivity found across the age groups (1994). A comparison in productivity between groups was reported in D'odorico et al. (2011); however, the study worked with children between ages 2 to 3 years where the two groups were defined by MLU scores unlike the groups determined in the present study by age. Note that the present study also

found a significant increase in productivity reflected in both mean productive items as well as in percentages of productive items used by the children till age 3 (Group B). The plateau and the decline were noted in the older groups (C and D).

4.1. Further Points to Discuss

The findings showed that person markers emerged early in Bangla-speaking children. This is possibly due to the typological features of Bangla that the language does not have any verbs with bare stems, and person markers are the only obligatory affixes with verb stems (Table 1). However, the results indicated that there was likely to be a hierarchy among the person markers which was also suggested in crosslinguistic findings. Children were often reported to have exhibited more ease with the first and the third person markers than the second person marker (e.g. Bassano, Maillochon, Klampfer, & Dressler, 2001; Stephany, 1997). The present study found that only the older groups used the second person forms of verbs; the use of 2nd person marker was noted from child 17 (3.0) onwards (Appendix D). There are cognitive challenges involved in using second person markers as children must first understand the difference between the "self" and the "rest of the world" (Schmalstieg, 1977, p. 72). As a result, children may show a preference towards using the first person markers. This along with the fact that the 3rd person forms have a high frequency in the environment are likely to have contributed to children's relative difficulty with the second person forms.

Also note that the past forms were infrequently used by the children (Appendix D). While there were only five instances of the past forms used by all children, only one child (3;2) displayed the productive use of one past progressive form. This is partly because of the reason that Bangla perfective aspect tends to be expressed using the present perfect forms that lead to low rates of production of the past forms. Note that the Bangla present perfect form is more frequent than the past simple, and structurally simpler than the past perfect forms which makes it a preferred form for young Bangla-speaking children (cf. Gathercole, Sebastian, & Soto, 1999 for the effect of linguistic simplicity). Besides, it is possible that the conversational design of the study may have contributed to the infrequency of production of the past forms. An earlier study, using elicitation tasks, conducted with Bangla-speaking children of the same age range showed that by age four children learned to use the past progressive forms correctly (Sultana et al., 2016).

The findings of the study reinforced the claims made in the item-based approach in the acquisition of early verb paradigm. There was a significant increase with increasing age. The study may be of interest to the researchers (e.g. linguists, language therapists) working on typical and atypical Bangla language acquisition in children. Along with testing the hypothesis with a larger group of children, future studies need to include other verb bases, i.e. complex and conjunct, to identify a comprehensive pattern of acquisition of Bangla verb inflections. Similarly, children's acquisition of verb productivity obtained through spontaneous language samples can be confirmed by examining them through a more structured design (e.g. elicitation tasks).

Finally, the present study considered only age as the factor contributing to productivity. Environmental factors such as the quality and the quantity of input are known to play a significant role in children's language development (e.g. Hadley, Rispoli, Fitzgerald, & Bahsen, 2011). Future research needs to examine how productivity interacts with age and the other factors.

References

Aguado-Orea, J., & Pine, J. M. (2015). Comparing different models of the development of verb inflections in early child Spanish. *PLoS ONE, 10*(3), 1-21. doi:10.1371/journal.pone.0119613

Bassano, D., Maillochon, I., Klampfer, S., & Dressler, W. (2001). The acquisition of verb morphology in French and Austrian-German: (II) Data Analysis. *Enfance, 53*(2), 117-148. doi:10.3917/enf.532.0117

Bhattacharja, S. (2010). Benglish verbs: A case of code-mixing in Bengali. In R. Otoguro, K. Ishikawa, H. Umemoto, k. Yoshimoto, & Y. Harada (Eds.), *Proceedings of the 24th Pacific Asia Conference on Language, Information and Computation* (pp. 75-84). Retrieved September 1, 2018 from http://www.aclweb.org/anthology/Y10-1011

Bhattacharya, S., Choudhury, M., Sarkar, S., &Basu, A. (2005). Inflectional morphology synthesis for Bengali noun, pronoun and verb systems. *Proceedings of the National Conference on Computer Processing of Bangla (NCCPB 05)* (pp. 34-43). Retrieved September 7, 2018 from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.121.8568&rep=rep1&type=pdf

Bhattacharyya, P., Chakrabarti, D., & Sharma, V. M. (2006). Complex predicates in Indian languages and wordnets. *Language Resources and Evaluation, 40*(3/4), 331-355. doi:10.1007/s10579-007-9032-x

Brandt, S., Verhagen, A., Lieven, E., &Tomasello, M. (2011). German children's productivity with simple transitive and complement-clause constructions: Testing the effects of frequency and diversity. *Cognitive Linguistics, 22*(2), 3325-357. doi:10.1515/COGL.2011.013

Chakraborty, R., & Leonard, L. B. (2012). A brief research report on acquisition of verb inflections in Bengali-speaking children. *Journal of Advanced Linguistic Studies, 1*(1/2), 40-53.

Chatterjee, T. (2014). Bilingual complex verbs: So what's new about them?. In K. Carpenter, O. David, F. Lionnet, C. Sheil, T. Stark, & V. Wauters (Eds.), *Proceedings of the 38th Annual Meeting of the Berkeley Linguistics Society* (pp. 44-62). Retrieved September 15, 2018 from http://escholarship.org/uc/item/79b0w3dd#page-2

Comrie, B. (2005) Language. Microsoft Encarta Online Encyclopedia, 2005. Microsoft Corporation.

Dasgupta, S., & Ng, V. (2006). Unsupervised morphological parsing of Bengali. *Language Resources and Evaluation, 40*(3/4), 311-330. doi:10.1007/s10 579-007-9031-y

D'Odorico, L., Fasolo, M., Cassibba, R., &Costantini, A. (2011). Lexical, morphological, and syntactic characteristics of verbs in the spontaneous production of Italian children. *Child Development Research, 2011*, 1-17. doi:10.1155/2011/498039

Eisenbeiss, S. (2010). Production methods in language acquisition research. In E. Blom, & S. Unsworth (Eds.), *Experimental methods in language acquisition research*. Retrieved October 8, 2018 from http://repository.essex.ac.uk/1151/1/EMLAR_production_accept_se-1.pdf

Ellis, R. (1985). *Understanding second language acquisition*. Great Clarendon Street, UK: Oxford University Press.

Gathercole, V. C., Sebastián, E., & Soto, P. (1999). The early acquisition of Spanish verbal morphology: Across-the-board or piecemeal knowledge?. *International journal of bilingualism*, *3*(2-3), 133-182.

Gleason, J. B. (1958). The child's learning of English morphology. In B. C. Lust, & C. Foley (Eds.), *First language acquisition: The essential readings* (253-273). Sussex, UK: Wiley-Blackwell.

Hadley, P. A., Rispoli, M., Fitzgerald, C., & Bahnsen, A. (2011). Predictors of morphosyntactic growth in typically developing toddlers: Contributions of parent input and child sex. *Journal of Speech, Language, and Hearing Research, 54(2),* 549-566. doi:10.1044/1092- 4388(2010/09-0216)

Hohenstein, J., Akhtar, N. (2007). Two-year-olds' productivity with verbal inflections. *Journal of Child Language*, *34*(4), 861-873. doi:10.1017/S0305000907008148

Klaiman, M.H. (2008) Bengali. In B. Comrie (ed.), The World's Major Languages (pp. 417–436). London: Routledge.

Lieven, E. V., Pine, J. M., & Baldwin, G. (1997). Lexically-based learning and early grammatical development. *Journal of child language*, *24*(1), 187-219.

Lust, B. C. (2006). *Child language: Acquisition and growth*. Cambridge, UK: Cambridge University Press.

Lustigman, L. (2012). Developing structural specification: Productivity in early Hebrew verb usage. *First Language*, *33*(1), 47-67. doi:10.1177/0142723711426828

Mondal, K. (2014). Morphological analysis of Bangla verb group in formal grammar. *International Journal of Computational Linguistics and Natural Language Processing*, *3*(4-9), 550-553.

Owens Jr., R. E. (2014). *Language development: An introduction* (8th ed.). Essex, UK: Pearson Education Limited.

Pizzuto, E., & Caselli, M. C. (1994). The acquisition of Italian verb morphology in a cross-linguistic perspective. In Y. Levy (Ed.), *Other children, other languages: Issues in the theory of language acquisition* (pp. 137-187). New Jersey: Lawrence Erlbaum.

Schmalstieg, W. R. (1977). A note on the verbal person markers in Indo-European. *Journal of Comparative Philology*, *91*(1), 72-76. Retrieved October 17, 2018 from http://www.jstor.org/stable/40848517

Stephany, U. (1997). The acquisition of Greek. In D. I. Slobin (Ed.), *The crosslinguistic study of language acquisition* (pp. 183-333). Mahwah, NJ: Lawrence Erlbaum.

Sultana, A. (2015). *Morphosyntactic development of typically-and atypically-developing Bangla-speaking children* (Unpublished doctoral dissertation). University of Canterbury, New Zealand.

Sultana, A. (2016). Morphological development of Bangla-speaking children: A pilot study. *The EFL Journal*, *7*(1), 73- 92.

Sultana, A., Fletcher, P., Klee, T., & Stokes, S. (2019). Ba-LARSP: Towards a Profile of Bangla. In M. J. Ball, P. Fletcher, & D. Crystal (Eds.), *Assessing Grammar: Even more languages of LARSP* (pp. 192- 208). Bristol: Multilingual Matters.

Sultana, A., Stokes, S., Klee, T., & Fletcher, P. (2016). Morphosyntactic development of Bangla-speaking preschool children. *First Language*, *36*(6), 637-657.

Tomasello, M. (2000a). The item-based nature of children's early syntactic development. *Trends in Cognitive Sciences*, *4*(4), 156-163. doi:http://dx.doi.org/10.1016/S13646613(00)01462-5

Tomasello, M. (2000b). First steps towards a usage-based theory of language acquisition. *Cognitive Linguistics*, *11*(1/2), 61-82. doi: 10.1515/cogl.2001.012

Tomasello, M. (2009). The usage-based theory of language acquisition. In Edith L. Bavin (Ed.), *The Cambridge handbook of child language* (pp. 69-87). Cambridge: Cambridge University Press. doi:10.1017/CBO9780511576164.005

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Appendices

Appendix A: *Verbal System of Bengali*

Verb Type	Subtype	Components of Verbs	Example
Simple		Verb	*Lekha*or *to write*
	Conjunct	Noun+ light verb (e.g.	*ranna kora* or *to cook*
Complex		do	*jiggesh kore neowa* or *to ask*
		Noun+light verb+ verb	*someone for oneself*
	Compound	Verb+Verb	*Ghumiyepora* or *to fall asleep*

Note: Adapted from Chatterjee 2014: 47-62

Appendix B: *Verb Stems and Their Frequency for Each Child*

Verb Stem	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		
Chor(to ride)							1								1															
Shun(to listen)							1																					1		
Atka(to shut/fix)							1		1	2				1			1			2	1			2						
Uth(to rise)									1								2	1			1					1	1	1		

Ghum(to sleep)									1						2								1			1	1			
Bana(to make)										1		1			1	1	1	5	1		1						1	1		2
Dhor(to hold)										1						1				1	2				1		3			
Por(to fall)										1														1			2			
Lag(to attach)										1					1		1									4				
Dho(to wash)											1										1		3						2	
Show(to lie down)											1	1					1		2	1										
Par(to be able)											2				1	1										1				1
Kan(to cry)															1		1													
Bhang(to break)																1														
Lag(to require)																	1	1	1								1			1
Dak(to call)																	1													
Jhul(to swing)																	2													
Mar(to beat)																		1												
Hat(to walk)																		2												
Likh(to write)																			2											
Baj(to ring)																				1						1	3			
Ghur(to rotate)																				1										
Kin(to buy)																					1									
Por(to wear)																					1		2							
Jan(to know)																							1							
Hara(to lose)																							1							

Phel(to drop)																						1						
Shaj(to decorate)																						1				1		
Pakra(to capture)																								1				
Jol(to fire up)																									1			
Shor(to transfer)																									1		1	
Chin(to know)																										1		
Dak(to call)																										1		
An(to bring)																										1		
Lapha(to jump)																										1		
Tol(to pick)																											1	
Paowa(to receive)																											1	1

Appendix C: *The Percentage of verb stems used once*

Group	Range (min-max)	Mean	Standard Deviation
Group A (n= 10) (2;0- <2;6 yrs)	67 (33- 100)	74.5	20.66
Group B (n= 5) (2;6- <3:0 yrs)	30 (45- 75)	61.4	13.37
Group C (n= 10) (3;0- <3;6 yrs)	75 (25- 100)	51.7	20.92
Group D (n= 5) (3;6- 4;0 yrs)	32 (31- 63)	48.8	11.84

Appendix D: *Inflections and Their Frequency for Each Child*

Child	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	
1	1																		
2	2		2							2		1							6
3	1		2			1			1			4							3
4			4			2	1		1										1
5			2	1						1									1
6	2		3				1			1		3							1
7	3		8			2				2		3							2
8	1		1																
9	3		7				1			3	1	2							4
10	1		2			1		1		5									8
11	2		7	1			2	1		5	1	4							4
12	2		6						2	3	1	1							5
13			5							4		2							
14	4		2					1	1		1								1
15	5		8	5		3	3		4	6		3							2
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							

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Investigating the Relationship between Narrative Microstructure and Reading Comprehension

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Abstract

Reading comprehension develops on a foundation of spoken language proficiency, including narrative ability. Despite broad links established in the literature, however, the relationship of narrative microstructure to reading comprehension is not well understood, even for narrative markers thought to be particularly associated with reading like literate language features (LLFs). The present study investigates the relationship of narrative microstructure to reading comprehension in school-age children in the US. Participants were 145 children in grades 1-4 who generated a spoken narrative and completed standardized subtests of decoding, vocabulary, and reading comprehension in English. Narratives were coded for proportion of LLFs and other markers of narrative microstructure. Regression analyses were conducted to evaluate which narrative measures best predicted reading comprehension in the presence and absence of the measures of decoding and vocabulary. Proportion of LLFs was the best narrative predictor of reading comprehension in the older children but not the younger children. No narrative measures predicted reading comprehension when decoding and vocabulary were included in the regression analyses. The results suggest LLFs may be limited in their utility as a marker of reading ability in school-age children and indicate narrative microstructure may not be as strong an index of reading readiness as previously believed. Further research is needed to identify whether any measure of narrative microstructure acts as an independent predictor of reading comprehension when working within a Simple View of Reading framework.

Keywords narratives, decoding, reading comprehension, vocabulary, literacy

1. Introduction

Development of reading comprehension is one of the chief linguistic challenges of school age. Accessing meaning from text depends on spoken language ability (e.g., Gardner-Neblett, Pungello, & Iruka, 2012; National Early Literacy Panel, 2008) and has a well-established relationship to specific aspects of linguistic proficiency like vocabulary (Proctor & Louick, 2018; Tunmer & Chapman, 2012). More recent research has established broad links between narrative ability and reading comprehension (Barton-Hulsey, Sevcik, & Romski, 2017; Suggate, Schaughency, McAnally, & Reese, 2018). However, the nature of the relationship between the two is not clear (e.g., Roth, Speece, & Cooper, 2002; Wellman et al., 2011) - partly due to

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poor specification of what is meant by "narrative ability." Indices of narrative microstructure do not seem to predict additional variance in reading when controlling for potential confounding variables such as vocabulary knowledge (Gardner-Neblett & Iruka, 2015; Kieffer, 2012; Uchikoshi, Yang, & Liu, 2018), and narrative-focused interventions do not necessarily lead to gains in reading ability (Connor et al., 2018), raising the possibility that a child's facility with narrative microstructure may not play any special role in developing reading comprehension. Surprisingly, the relationship between literate language features (LLFs) – a set of narrative measures claimed to be particularly tied to literacy (e.g., Greenhalgh & Strong, 2001) – and reading comprehension has not been directly evaluated. With measures of narrative microstructure used to identify children at-risk for reading difficulties (Allen, Ukrainetz, & Carswell, 2012; Griffin, Hemphill, Camp, & Wolf, 2004) and as targets to improve linguistic abilities supporting reading (Adlof, McLeod, & Leftwich, 2014; Phillips et al., 2016; Spencer, Kajian, Petersen, & Bilyk, 2013), it is important to answer the question of whether narrative microstructure is related to reading comprehension. The primary goal of the present study is to verify whether narrative measures, and in particular LLFs, concurrently predict reading comprehension when controlling for decoding ability and vocabulary knowledge in school-age children. A secondary goal is to evaluate whether any such relationship is stronger in more experienced readers vs. early readers.

1.1. The relationship of oral language to reading comprehension

The Simple View of Reading is a robust framework indicating reading comprehension is comprised of two components – decoding ability and oral language comprehension. (Catts, Herrera, Nielsen, & Bridges, 2015; Hogan, Bridges, Justice, & Cain, 2011). The decoding component involves converting the orthographic cypher into its spoken form (National Early Literacy Panel, 2008), and requires a discrete set of skills related to sound-spelling correspondences and phonological processing (Lonigan & Shanahan, 2009). As texts increase in linguistic sophistication, older children rely more on the broader set of skills supporting oral comprehension (Geva & Farnia, 2012). These skills include proficiency in a variety of domains, including morphological awareness (Kieffer, Biancarosa, & Mancilla-Martinez, 2013) and syntactic awareness (Leider, Proctor, Silverman, & Harring, 2013), although measures of vocabulary knowledge are often the best linguistic predictors of reading ability (Kieffer, 2012; Proctor & Louick, 2018; Tunmer & Chapman, 2012; Uchikoshi et al., 2018).

Spoken narratives have received increasing attention in literacy research for two potential clinical applications: early identification of reading challenges (Allen et al., 2012; Gardner-Neblett & Iruka, 2015; Griffin et al., 2004) and subsequent remediation of those challenges (Adlof et al., 2014; Clarke, Snowling, Truelove, & Hulme, 2010; Spencer et al., 2013). Coarse relationships between overall narrative ability and reading comprehension have been identified previously (Miller et al., 2006), but these relationships are not well specified (Roth et al., 2002). One obstacle to clarifying the nature of the relationship is the broad use of "narrative ability" as a construct when, in reality, a child's ability to produce a story taps multiple

skills. From a schematic perspective, there is knowledge of story grammar, as reflected by the ability to include specific narrative elements like setting, conflict, and resolution (Labov, 1972). This knowledge of narrative macrostructure facilitates a child's ability to construct stories as well as her ability to understand them (Davies, Shanks, & Davies, 2004; Petersen, 2010), as reflected in studies showing that children receiving story grammar interventions (e.g., Spencer et al., 2013) show gains in reading comprehension (Fitzgerald & Spiegel, 1983; Gersten, Fuchs, Williams, & Baker, 2001).

The focus of the present study is on narrative microstructure. In contrast to macrostructure, microstructure is a broad category of linguistic indices, including lexical measures like number of different words in the story and morphosyntactic measures like the average number of words used per clause. While microstructure use is tied to the kinds of linguistic proficiency associated with oral comprehension (e.g., Justice, Bowles, Pence, & Gosse, 2010), it is less clearly related to reading ability (Barton-Hulsey et al., 2017; Wellman et al., 2011) than macrostructure is. The evidence linking linguistic proficiency in narratives to reading comprehension is suggestive, but tentative. For example, children with reading disorders typically score lower on narrative microstructure measures relative to age-matched peers with typical development (e.g., Catts, Adlof, Hogan, & Weismer, 2005; Westerveld, Gillon, & Moran, 2008) and children with language impairment generally have trouble with both narrative microstructure and reading comprehension (Catts, Bridges, Little, & Tomblin, 2008; S. L. Gillam & Gillam, 2016; Kaderavek & Sulzby, 2000).

The finding that children who struggle with reading also produce poor narratives implies a connection between the two domains. However, children with reading disorders and language impairment also both have vocabulary deficits, and vocabulary knowledge is correlated not only with reading comprehension but also with measures of narrative microstructure (e.g., Ebert & Scott, 2014). Thus, the narrative-reading relationship may be mediated by a child's vocabulary ability (Gardner-Neblett & Iruka, 2015; Kieffer, 2012). This notion is reinforced in a study by Uchikoshi and colleagues (2018), which found measures of narrative microstructure and macrostructure in Spanish-speaking language learners to be significantly correlated not only with later reading comprehension, but also with vocabulary and decoding. When controlling for vocabulary and decoding ability, only the narrative macrostructure measure was a significant predictor of reading comprehension. Thus, one of the goals of this study is to investigate whether microstructural measures have a relationship to reading comprehension independent of potential confounding variables, like vocabulary knowledge.

Another consideration in evaluating the nebulous relationship between narrative measures and reading comprehension may be developmental. Early reading comprehension is highly tied to decoding (Vellutino, Tunmer, Jaccard, & Chen, 2007), so the influence of other aspects of linguistic knowledge (including narrative microstructure) may only be seen once children's decoding skill is sufficiently established. Such developmental

effects are attested in the literature, as when total number of words produced in a narrative was correlated with reading comprehension in a group of 9-12 year-old children, but not a 6-8 year-old group (Ebert & Scott, 2014). Likewise, narrative quality and length concurrently predicted reading fluency (speed of reading connected text aloud) for children in second grade, but not in first (Reese, Suggate, Long, & Schaughency, 2010). One of the goals of the present (cross-sectional) study is to evaluate whether the relationships between narratives and reading comprehension appear to be stronger in older vs. younger children.

1.2. *The putative connection between LLFs and reading comprehension*

There is a third, relatively unexplored, possibility for the tenuous findings of a connection between narratives and reading ability: the most appropriate microstructure measures may have not been evaluated. LLFs are a subset of narrative microstructural elements theorized to be particularly tied to reading comprehension (Greenhalgh & Strong, 2001; Westby, 1991). As such, it seems logical any relationship between narrative microstructure and reading comprehension would be seen most strongly with LLFs, although no research appears to have explored such a relationship.

LLFs, which include structures like elaborated noun phrases ("The deep, dark cave") and conjunctions ("He ran because he was scared"), are associated with the literary register of stories but not typical of everyday speech (Greenhalgh & Strong, 2001). Because LLFs are common in written discourse but rare in conversation, facility with LLFs primarily develops in pre-literate children through hearing stories read aloud (Heath, 1982; Westby, 1991). This exposure to LLFs should prepare a child to understand such structures when encountering them in text (Greenhalgh & Strong, 2001; Roth et al., 2002; Roth, Speece, Cooper, & Paz, 1996). Indeed, facility with LLFs is suggested to be "critical for language, literacy, and academic success" (Curenton & Justice, 2004, p. 241).

While there is logic to the notion that hearing (or reading) stories makes it both easier to parse the linguistic structures common to prose and more likely to use those structures in one's own stories, a review of the literature suggests the putative link between LLFs and reading comprehension (Garton & Pratt, 1989; Purcell-Gates, 1988; Tannen, 1982; Wallach, 1990; Westby, 1991) lacks empirical validation (e.g., Benson, 2009). This gap in the literature is significant, as the presumption that LLFs are a predictor of reading comprehension seems to be taken for granted elsewhere in the literature (Curenton, Craig, & Flanigan, 2008; Lemmon & McDade, 2013), with some studies implementing LLF interventions based on the assumption that they will support reading development (Dawkins & O'Neill, 2011; Petersen, Gillam, Spencer, & Gillam, 2010; Phillips et al., 2016). While LLFs are sensitive to development (Curenton & Justice, 2004; Eisenberg et al., 2008), and diagnostically relevant in distinguishing children with language impairments from children with typical development (Anderson, 2011; Greenhalgh & Strong, 2001), the notion that they are related to text comprehension appears untested. Empirically establishing a connection between LLFs and reading is important to address the gap in the literature

and to provide empirical support for the clinical practice of assuming LLFs are predictive of reading comprehension.

1.3. The present study

The extant literature does not establish a clear relationship between measures of narrative microstructure and reading comprehension, and it is unclear to what extent the nature of the measures and the age of the children studied influence this relationship. The exploratory study described here uses a narrative generation paradigm to empirically validate the relationship between individual measures of narrative microstructure, including LLFs, and reading comprehension, while controlling for other predictors of reading ability. Older and younger children's performance on reading-related and narrative measures were compared to address 3 specific research questions:

1. Does the relationship between narrative microstructure and reading comprehension change with age?

Previous work has established that relative contributions of code-based skills and other linguistic skills to reading comprehension shift with time. Some evidence suggests developmental changes affect how narratives relate to understanding text as well (Ebert & Scott, 2014; Reese et al., 2010). While the study presented here is cross-sectional, participants were recruited across multiple grade levels. Given that books for later readers are more linguistically complex and that previous studies have shown stronger relationships between narratives and reading in older children, it is expected that narrative ability will be a better predictor of comprehension for this group relative to novice readers. Specifically, microstructural measures are expected to better predict reading comprehension in older children relative to younger children.

2. Do LLFs have a stronger relationship to reading comprehension than other measures of narrative microstructure?

Research supporting links between narrative microstructure and reading is equivocal, as reviewed above. Given the theoretical basis for a connection between LLFs and literacy, it is hypothesized that LLFs will be a stronger predictor of reading comprehension than other narrative measures in regression analyses.

3. Do LLFs account for additional variance in reading comprehension beyond what is accounted for by typical predictors of reading ability?

As discussed above, decoding ability and vocabulary knowledge are robust predictors of reading comprehension, and the latter may mediate relationships between narrative ability and reading comprehension. Based on the purported strength of the relationship between understanding text and LLFs, it is hypothesized that LLFs will be a significant independent predictor of reading comprehension even when accounting for decoding and vocabulary skill in the regression.

2. Methodology

The methodology of the research should be detailed very clearly referring to relevant theories.

2.1. Participants

As part of a larger study approved by an Institutional Review Board, 148 children from grades 1-4 were recruited from three schools (mean age 8.4 years; 78 female) in southern California. All children whose parents or caregivers consented for them to be in the study were included save those with a history of speech and language disorders, cognitive impairment, or learning disability (as reflected in school records or parent report). The children in the sample approximated the demographic background of the local community. To address the research question regarding the influence of age on narrative-reading relationships, children were split into two groups based on grade: a group of early readers (grades 1-2) who were expected to still be consolidating their decoding skills and a group of older readers (grades 3-4) who were predicted to be more experienced decoders.

2.2. Data collection and processing

2.2.1. Reading-related measures

The standardized testing battery included three subtests from the Woodcock-Johnson 3 Tests of Achievement (Woodcock, McGrew, & Mather, 2001). The non-word decoding subtest ("Word Attack") was used as the decoding predictor. The non-word subtest was chosen over the word decoding subtest ("Letter Word Identification") as it reduces potential confounding with vocabulary found in decoding tests using real words. On this task, children read invented words aloud (e.g., knoink) from a pre-printed list. If the word was mispronounced or not said smoothly it was marked as incorrect. In keeping with previous studies (Kieffer, 2012; Proctor, Carlo, August, & Snow, 2005), vocabulary knowledge was assessed using an expressive vocabulary subtest ("Picture Vocabulary"), where children labelled color pictures (such as corn or screwdriver). Finally, the reading comprehension subtest ("Passage Comprehension") was administered to evaluate understanding of text. On the earliest items of this subtest, children match icons to pictures. As children progress through the test, they are asked to provide a missing word to complete a sentence or paragraph (e.g., Please answer the phone in the kitchen – it has been _____ (ringing) for some time). While the paradigm used in this subtest differs from those where children answer multiple-choice questions based on passages, the Passage Comprehension subtest appears to be the most commonly used in studies evaluating narrative-reading relationships (Barton-Hulsey et al., 2017; Miller et al., 2006; Uchikoshi et al., 2018; Wellman et al., 2011). Using three subtests from the same testing battery also improved comparability across the standardized measures, as they were developed in tandem.

All subtests were administered according to the published protocols. Average split-half reliabilities were .91, .74, and .91 for the decoding, vocabulary, and reading comprehension subtests (Woodcock et al., 2001), respectively. Items were scored dichotomously as correct or incorrect. To better facilitate

comparisons with the (unstandardized) narrative measures, the raw scores from the subtests were used.

2.2.2. The narrative task

Narratives were generated using two color picture sets ("Shipwreck" and "Late for School") from the Test of Narrative Language (R. B. Gillam & Pearson, 2004) that depict challenges a child has on their way to school. Children viewed one of the picture sets and created a story that went with the pictures. Narratives were audio recorded for later transcription. To ensure fidelity, two trained graduate students independently transcribed the audio files. A third student identified discrepancies between the transcripts and resolved them by listening to the original audio file.

2.2.3. The coding schema

Trained graduate assistants coded narratives by hand for a variety of microstructural indices (for a sample of a coded transcript, see Appendix). Total number of words (TNW) was used as a gauge of overall productivity and number of different words (NDW) provided an index of lexical diversity. Syntactic complexity was measured through proposition density – mean length of proposition in words. Propositions are a unit of measure similar to a clause defined as a main verb and its arguments (Reilly, Wasserman, & Appelbaum, 2013). There were two indices of accuracy: proportion of lexical and morphosyntactic errors, respectively. Lexical errors were defined as problems of word selection relative to the picture reference or sentence context (e.g., *The mom and son were making a plane* when the picture shows a boat). Morphosyntactic errors were grammatical violations including errors of verb tense (*Mom help Jonathan; The boat broked*), pronoun use (*Him made a boat; A little boy was with her mom*), and word omissions (*He went to *the bus; His teacher *was looking at him*).

LLFs were analyzed using Greenhalgh and Strong's (2001) schema to ensure consistency with other studies (Anderson, 2011; Curenton & Justice, 2004; Lemmon & McDade, 2013; Woolpert, 2016). Under this schema, LLFs comprise coordinating and subordinating conjunctions, adverbs, mental/linguistic verbs (e.g., think, say), and elaborated noun phrases. Elaborated noun phrases included those with two modifiers (e.g., a little boy), prepositional phrases (a project for his school), and relative clauses (e.g., a young boy who was late for school). The total number of LLFs across categories was summed and divided by the number of propositions to yield a proportion that controlled for length differences.

The author coded 10% of the transcriptions independently. The Pearson correlation coefficient for agreement between the two coders was 0.99, indicating excellent reliability between the coders. All proportion-based measures were log transformed before analysis.

2.3. Data analysis

Initial relationships between the measures of interest were identified through simple correlations. Stepwise regression analyses were used to address the research questions.

3. Findings

Three children did not progress beyond the earliest items of the reading comprehension subtest (i.e., the picture-matching section); their data were excluded from analysis. Group means were imputed for four children who lacked complete data. Imputation did not substantially alter the results.

Descriptive statistics for the standardized and narrative measures are located in Table 1, disaggregated by age group. The partial correlations between reading comprehension and the other study measures are presented in Table 2, disaggregated by grade grouping. Due to concerns with alpha escalation, a false discovery rate (FDR) procedure (Benjamini & Hochberg, 1995) was used, with the FDR set at 0.10. Decoding and vocabulary were both strongly correlated with reading ability for the younger and older groups of children, as predicted by the SVR. Proposition density was moderately correlated with reading comprehension in the younger group (r = .34, p < .01). In the older group, proportion of LLFs was moderately correlated with reading comprehension (r = .40, p < .01), followed by NDW and TNW.

Table 1
Means and standard deviation for age and scores from standardized measures for the entire sample disaggregated by group.

	Younger (n = 62)		Older (n = 83)	
	M	*SD*	*M*	*SD*
Age	7.36	0.62	9.25	0.51
NW Decoding***	14.31	7.37	20.67	6.23
Vocabulary***	19.00	3.78	21.42	3.38
Reading Comp***	19.77	5.84	26.46	4.81
TNW	57.34	56.40	63.63	30.42
NDW	33.06	19.78	38.31	14.50
Proposition density	5.51	1.02	6.07	1.21
Lexical errors	0.15	0.19	0.09	0.12
Morph errors	0.13	0.18	0.13	0.13
LLFs**	0.22	0.17	0.35	0.22

Note: n = number of participants. SD = standard deviation. NW = Non-word. TNW = Total number of words. NDW = Number of different words. Morph = morphological. LLFs = literate language features.
** Significant difference between the younger and older groups (p < .01).
*** (p < .001).

Stepwise regression analyses (see Table 3) were used to identify how well narrative and reading-related measures predicted reading comprehension. To address the question of whether LLFs are more strongly associated with reading than other narrative measures, a pair of regressions were carried out using narrative measures only (Models 1A and 1B). For the younger group, Model 1A was significant (R^2 = 0.19, F(1,59) = 6.83, p < 0.01) with two predictors, indicating that proposition density (B = 1.98, t(1,59) = 2.96, p < 0.01) and proportion of morphological errors (B = -1.12, t(1,59) = -2.31, p < 0.05) are the only narrative measures that predict reading comprehension in the younger children. The model accounted for 19% of the variability in reading in the younger group. For the older group, Model 1B was significant (R^2 = 0.21, F(1,78) = 10.07, p < 0.001) with two predictors, indicating that proportion of LLFs (B = 1.52, t(1,78) = 3.45, p < 0.01) and NDW (B = 0.07, t(1,78) = 2.07, p < 0.05) account for 21% of the variability in reading comprehension in the older children.

Table 2

Intercorrelation matrix between the reading-related measures and the narrative measures.

	Reading Comp	**Decoding**	**Vocab**	**TNW**	**NDW**	**Props**	**Prop Density**	**Lex Errors**	**Morph Errors**	**LLFs**
Reading Comp	-	.75**	.59**	.17	.27*	.13	.34**	.05	-.26*	.29*
Decoding	.45**	-	.40**	.09	.14	.07	.21	-.09	-.16	.25*
Vocabulary	.46**	.22*	-	.18	.29*	.15	.24*	-.01	-.20	.15
TNW	.30**	.31**	.14	-	.96**	.99**	.32**	-.08	.00	.28*
NDW	.33**	.33**	.17	.97**	-	.94**	.38**	-.07	.02	.33**
Propositions	.29**	.21*	.12	.89**	.87**	-	.18	-.11	-.01	.23*
Proposition Density	.26*	.43**	.12	.51**	.49**	.09	-	.22*	.03	.55**
Lex Errors	-.04	.07	-.16	.05	.08	.00	.09	-	.20	-.04
Morph Errors	-.04	.16	-.17	.06	.08	.00	.09	.25*	-	.02
LLFs	.40**	.29**	.42**	.34**	.33**	.20*	.43**	-.07	-.05	-

Note: Values above the diagonal are for the early readers (grades 1-2) and values below are the later readers (grades 3-4). Read Comp = reading comprehension. Vocab = vocabulary. TNW = total number of words. NDW = number of different word. Props = propositions. Lex = lexical. Morph = morphosyntactic errors. LLFs = literate language features. * = $p < .05$; ** = $p < .01$.

The stepwise regressions were re-run to evaluate whether narrative measures predicted unique variance in reading comprehension beyond what was accounted for by decoding and vocabulary (Models 2A and 2B). Results were similar for both regressions: decoding and vocabulary both entered as predictors, and with that variance accounted for, none of the narrative measures were significant predictors of reading comprehension (see Table 3, Models 2A and B). In the younger group, the model was significant (R^2 = 0.66, $F(1,59) = 56.18$, $p < 0.001$), with decoding ($B = 0.48$, $t(1,59) = 7.28$, $p < 0.001$) and vocabulary ($B = 0.53$, $t(1,59) = 4.13$, $p < 0.001$) accounting for 66% of the variability in reading comprehension. In the older group, the model was significant ($R^2 = 0.38$, $F(1,78) = 23.47$, $p < 0.001$), with decoding ($B = 0.32$, $t(1,78) = 4.57$, $p < 0.001$) and vocabulary ($B = 0.52$, $t(1,59) = 3.99$, $p < 0.001$) accounting for 38% of the variability in reading comprehension.

Table 3
Results of stepwise regression models for the narrative measures alone (1A and 1B) and the narrative measures and the SVR measures (2A and 2B).

Variables	Model 1A		Model 1B		Model 2A		Model 2B	
	B	*t*	*B*	*t*	*B*	*t*	*B*	*t*
Intercept	5.76	1.43	25.54	15.03***	2.77	1.21	8.64	3.03**
Narrative Measures								
TNW	0.06	.51	-0.08	-.32	0.06	0.71	0.12	1.20
NDW	0.17	1.37	0.07	2.07*	0.09	1.18	0.13	1.36
Proposition Density	1.98	2.96**	0.10	.92	0.14	1.80	0.04	0.37
Lexical Errors	0.03	.26	-0.02	-.19	0.11	1.43	0.01	0.09
Morphological Errors	-1.12	-2.31*	-0.03	-.29	-0.10	-1.24	-0.07	-0.77
Lit. Lang. Features	0.15	1.10	1.39	3.06**	.010	1.14	0.15	1.43
SVR Measures								
Non-Word Decoding					.48	7.28***	0.32	4.57***
Vocabulary					.53	4.13***	0.52	4.08***
R^2	0.19		0.21		0.66		0.38	
df	59		80		59		80	

Note: TNW = Total number of words. NDW = Number of different words. Lit. Lang. = Literate language. SVR = Simple View of Reading.
*** (p < .001).

4. Discussion and Conclusions

The nature of the relationship of narrative microstructure to comprehension of text in school children is not well specified in the literature. This exploratory study sought to empirically validate the relationship between reading comprehension, LLFs, and other microlinguistic measures of narrative competence. Research questions concerned 1) whether age affected the narrative-reading relationship, 2) whether LLFs were a stronger concurrent predictor of reading than other microlinguistic indices, and 3) whether any narrative measure uniquely predicted reading comprehension when accounting for decoding and vocabulary ability.

For the first research question, it was hypothesized that the increasing reliance on higher-order language skills in older children (Geva & Farnia, 2012; Vellutino et al., 2007) would be reflected in a stronger relationship between the narrative measures and reading comprehension in the older group relative to the younger group. The hypothesis was partially supported. Proportion of LLFs, NDW and TNW were all significantly correlated with reading comprehension in the older group, while only one narrative measure (proposition density) was significantly correlated in the younger. In addition, narrative measures accounted for 2% of extra variance in reading comprehension in the older children (Model 1B) relative to the younger children (Model 1A). This result parallels previous studies that have found narrative measures to better predict reading comprehension in older children relative to younger children (Ebert & Scott, 2014; Reese et al., 2010). Future research should evaluate whether other microstructure measures (such as proposition density, the best narrative predictor of reading in the younger children) are better early indicators of reading comprehension problems in a longitudinal paradigm, or whether more conventional vocabulary measures are best-suited to this task (Gardner-Neblett & Iruka, 2015; Kieffer, 2012; Uchikoshi et al., 2018).

With regard to the second research question, there was qualified support for the hypothesis that LLFs better predicted reading than other narrative measures. For the older children, use of LLFs and reading comprehension were moderately correlated (see Table 2), and the former was the best narrative predictor of the latter (Table 3, Model 1B). LLF use was not significantly correlated with reading comprehension in the younger children, and proposition density and proportion of morphological errors were the only significant narrative predictors of reading comprehension in this group (Table 3, Model 1A). It is noted that older children used significantly more LLFs in their narratives than younger children (Table 1), reinforcing the notions that they are sensitive markers of developmental changes in linguistic ability (Curenton & Justice, 2004) and may be useful for identifying language disorders (Greenhalgh & Strong, 2001). If they are primarily present only in the narratives of children who are already experienced readers, however, that casts doubt on their utility for identifying children at-risk of reading challenges (e.g., Lemmon & McDade, 2013).

For the third question, the hypothesis was that LLFs would be unique predictors of reading comprehension even when decoding and vocabulary were entered into the regression. This hypothesis was not supported by the data. Consistent with previous studies and the SVR framework, decoding

and vocabulary were significant predictors of reading comprehension in both age groups, and no narrative measure was a significant predictor of reading comprehension when controlling for these two components. This finding raises questions about the specific use of narrative microstructure as an area to assess for identifying reading difficulties and to target in remediation of those difficulties, particularly in younger children, where decoding and vocabulary accounted for 66% of the variance in reading comprehension. The results suggest the evidence base for interventions targeting LLFs as a means to improve reading outcomes (Petersen et al., 2010; Phillips et al., 2016) needs expanding, especially as a recent study showed such interventions may not generalize to improved reading (Connor et al., 2018).

In sum, the results did not provide strong evidence of a connection between reading comprehension and microstructure using a narrative generation paradigm. While the nature of the standardized reading comprehension test may have something to do with the outcomes seen, findings of a narrative-reading relationship were likewise limited in the study by Ebert and Scott (2014), which used a multiple-choice test of reading comprehension. It is also possible use of LLFs would have had a stronger relationship with reading comprehension in a retell paradigm (e.g., Greenhalgh & Strong, 2001) vs. a generation paradigm Further work is needed to evaluate whether the relationship between narratives and reading comprehension is limited to knowledge of narrative macrostructure (Uchikoshi et al., 2018; Wellman et al., 2011), or whether there is a role for narrative microstructure as well. While the use of a composite measure of LLFs vs. separate indices is a limitation of the current study, it mirrors the convention in the literature to consider LLFs as a "set of linguistically specific features of discourse" (Anderson, 2011, p. 110, emphasis added). Future studies should examine relationships between narrative microstructure and reading comprehension, particularly with regard to individual LLF measures, to add further specificity to claims of broad relationships that may not be empirically supported. Such research would seem necessary to support inclusion of narrative microstructure targets for the specific purpose of treating reading problems (Adlof et al., 2014; Phillips et al., 2016; Spencer et al., 2013). Doubtless there is value in the ability to tell a well-formed story in and of itself, but that is a separate issue from whether interventions targeting microstructure will improve reading outcomes. In the meantime, speech-language pathologists and other school-based professionals may wish to support children with reading challenges by targeting phonological skills supporting decoding (Ehri et al., 2001; Ryder, Tunmer, & Greaney, 2008), vocabulary and background knowledge more directly tied to comprehension (Clarke et al., 2010; Wallach & Ocampo, 2017), and knowledge of story grammar (Davies et al., 2004; Petersen, 2010).

References

Adlof, Suzanne M, McLeod, Angela N, & Leftwich, Brianne. (2014). Structured narrative retell instruction for young children from low socioeconomic backgrounds: a preliminary study of feasibility. *Frontiers in psychology, 5*.

Allen, Melissa M, Ukrainetz, Teresa A, & Carswell, Alisa L. (2012). The narrative language performance of three types of at-risk first-grade readers. *Language, Speech, and Hearing Services in Schools, 43*(2), 205-221.

Anderson, Alida. (2011). Linguistic specificity through literate language use in preschool-age children with specific language impairment and typical language. *Child Language Teaching and Therapy, 27*(1), 109-123.

Barton-Hulsey, Andrea, Sevcik, Rose A, & Romski, MaryAnn. (2017). Narrative Language and Reading Comprehension in Students With Mild Intellectual Disabilities. *American journal on intellectual and developmental disabilities, 122*(5), 392-408. doi:10.1352/1944-7558-122.5.392

Benson, Susan E. (2009). Understanding literate language: Developmental and clinical issues. *Contemporary Issues in Communication Science and Disorders, 36*, 174-178.

Catts, H. W., Adlof, Suzanne M., Hogan, Tiffany P., & Weismer, Susan Ellis. (2005). Are Specific Language Impairment and Dyslexia Distinct Disorders? *Journal of Speech, Language & Hearing Research, 48*(6), 1378-1396. doi:10.1044/1092-4388(2005/096)

Catts, H. W., Bridges, Mindy Sittner, Little, Todd D., & Tomblin, J. Bruce. (2008). Reading Achievement Growth in Children With Language Impairments. *Journal of Speech, Language & Hearing Research, 51*(6), 1569-1579. doi:10.1044/1092-4388(2008/07-0259)

Catts, H. W., Herrera, Sarah, Nielsen, Diane Corcoran, & Bridges, Mindy Sittner. (2015). Early prediction of reading comprehension within the simple view framework. *Reading and Writing, 28*(9), 1407-1425.

Clarke, Paula J, Snowling, Margaret J, Truelove, Emma, & Hulme, Charles. (2010). Ameliorating children's reading-comprehension difficulties: A randomized controlled trial. *Psychological Science, 21*(8), 1106-1116.

Connor, Carol McDonald, Phillips, Beth M., Kim, Young–Suk Grace, Lonigan, Christopher J., Kaschak, Michael P., Crowe, Elizabeth, . . . Al Otaiba, Stephanie. (2018). Examining the Efficacy of Targeted Component Interventions on Language and Literacy for Third and Fourth Graders Who are at Risk of Comprehension Difficulties. *Scientific Studies of Reading, 22*(6), 462-484. doi:10.1080/10888438.2018.1481409

Curenton, Stephanie M, Craig, Michelle Jones, & Flanigan, Nadia. (2008). Use of decontextualized talk across story contexts: How oral storytelling and emergent reading can scaffold children's development. *Early education and development, 19*(1), 161-187.

Curenton, Stephanie M, & Justice, Laura M. (2004). African American and Caucasian Preschoolers' Use of Decontextualized Language - Literate Language Features in Oral Narratives. *Language, Speech, and Hearing Services in Schools, 35*(3), 240-253.

Davies, Peter, Shanks, Becky, & Davies, Karen. (2004). Improving narrative skills in young children with delayed language development. *Educational Review, 56*(3), 271-286.

Dawkins, Suzanne, & O'Neill, Marnie. (2011). Teaching literate language in a storytelling intervention. *The Australian Journal of Language and Literacy, 34*(3), 294.

Ebert, Kerry Danahy, & Scott, Cheryl M. (2014). Relationships between narrative language samples and norm-referenced test scores in language assessments of school-age children. *Language, Speech, and Hearing Services in Schools, 45*(4), 337-350.

Ehri, Linnea C, Nunes, Simone R, Willows, Dale M, Schuster, Barbara Valeska, Yaghoub- Zadeh, Zohreh, & Shanahan, Timothy. (2001). Phonemic awareness instruction helps children learn to read: Evidence from the National Reading Panel's meta- analysis. *Reading Research Quarterly, 36*(3), 250-287.

Eisenberg, Sarita L., Ukrainetz, Teresa A., Hsu, Jennifer R., Kaderavek, Joan N., Justice, Laura M., & Gillam, Ronald B. (2008). Noun Phrase Elaboration in Children's Spoken Stories. *Language, Speech, and Hearing Services in Schools, 39*(2), 145-157.

Fitzgerald, J., & Spiegel, D.L. (1983). Enhancing children's reading comprehension through instruction in narrative structure. *Journal of Literacy Research, 15*(2), 1-17.

Gardner-Neblett, Nicole, & Iruka, Iheoma U. (2015). Oral narrative skills: Explaining the language-emergent literacy link by race/ethnicity and SES. *Developmental Psychology, 51*(7), 889.

Gardner-Neblett, Nicole, Pungello, Elizabeth P, & Iruka, Iheoma U. (2012). Oral narrative skills: Implications for the reading development of African American children. *Child Development Perspectives, 6*(3), 218-224.

Garton, Alison, & Pratt, Chris. (1989). *Learning to be literate: The development of spoken and written language*: Basil Blackwell.

Gersten, Russell, Fuchs, Lynn S, Williams, Joanna P, & Baker, Scott. (2001). Teaching reading comprehension strategies to students with learning disabilities: A review of research. *Review of Educational Research, 71*(2), 279-320.

Geva, Esther, & Farnia, Fataneh. (2012). Developmental changes in the nature of language proficiency and reading fluency paint a more complex view of reading comprehension in ELL and EL1. *Reading and Writing, 25*(8), 1819-1845.

Gillam, R.B., & Pearson, N.A. (2004). *Test of Narrative Language*. Austin, TX: Pro-ED.

Gillam, Sandra Laing, & Gillam, Ronald B. (2016). Narrative discourse intervention for school-aged children with Language Impairment: Supporting knowledge in language and literacy. *Topics in Language Disorders, 36*(1), 20-34.

Greenhalgh, Kellie S., & Strong, Carol J. (2001). Literate Language Features in Spoken Narratives of Children with Typical Language and Children

with Language Impairments. *Language, Speech and Hearing Services in Schools, 32*, 114-125.

Griffin, Terri M, Hemphill, Lowry, Camp, Linda, & Wolf, Dennis Palmer. (2004). Oral discourse in the preschool years and later literacy skills. *First Language, 24*(2), 123-147.

Heath, SB. (1982). What No Bedtime Story Means: Narrative Skills at Home and School. *Language in Society, 11*, 49-76.

Hogan, Tiffany P, Bridges, Mindy Sittner, Justice, Laura M, & Cain, Kate. (2011). Increasing higher level language skills to improve reading comprehension. *Focus on Exceptional Children, 44*(3), 1.

Justice, L. M., Bowles, Ryan, Pence, Khara, & Gosse, Carolyn. (2010). A scalable tool for assessing children's language abilities within a narrative context: The NAP (Narrative Assessment Protocol). *Early Childhood Research Quarterly, 25*(2), 218-234.

Kaderavek, Joan N., & Sulzby, Elizabeth. (2000). Narrative Production by Children With and Without Specific Language Impairment: Oral Narratives and Emergent Readings. *Journal of Speech, Language and Hearing Research, 43*(1), 34-49.

Kieffer, Michael J. (2012). Early oral language and later reading development in Spanish-speaking English language learners: Evidence from a nine-year longitudinal study. *Journal of Applied Developmental Psychology, 33*(3), 146-157.

Kieffer, Michael J., Biancarosa, Gina, & Mancilla-Martinez, Jeannette. (2013). Roles of morphological awareness in the reading comprehension of Spanish-speaking language minority learners: Exploring partial mediation by vocabulary and reading fluency. *Applied Psycholinguistics, 34*(4), 697-725. doi:10.1017/S0142716411000920

Labov, W. (1972). *Language in the Inner City: Studies in the Black English Vernacular*. Philadelphia: University of Pennsylvania Press.

Leider, Christine Montecillo, Proctor, C Patrick, Silverman, Rebecca D, & Harring, Jeffrey R. (2013). Examining the role of vocabulary depth, cross-linguistic transfer, and types of reading measures on the reading comprehension of Latino bilinguals in elementary school. *Reading and Writing, 26*(9), 1459-1485. doi:10.1007/s11145-013-9427-6

Lemmon, Regina D, & McDade, Hiram L. (2013). The Effects of Age and Household Income on the Use of Literate Language Features. *Communication Disorders Quarterly, 34*(3), 144-151.

Lonigan, Christopher J, & Shanahan, Timothy. (2009). Developing Early Literacy: Report of the National Early Literacy Panel. Executive Summary. A Scientific Synthesis of Early Literacy Development and Implications for Intervention. *National Institute for Literacy*.

Miller, Jon F., Heilmann, John, Nockerts, Ann, Iglesias, Aquiles, Fabiano, Leah, & Francis, David J. (2006). Oral Language and Reading in Bilingual Children. *Learning Disabilities Research & Practice, 21*, 30-43.

National Early Literacy Panel. (2008). *Developing Early Literacy: Report of the National Early Literacy Panel*. Retrieved from Washington, D.C.: http://www.nifl.gov/earlychildhood/NELP/NELPreport.html

Petersen, D. B. (2010). A Systematic Review of Narrative-Based Language Intervention With Children Who Have Language Impairment. *Communication Disorders Quarterly, 32*(4), 207-220. doi:10.1177/1525740109353937

Petersen, D. B., Gillam, S. L., Spencer, T., & Gillam, R. B. (2010). The Effects of Literate Narrative Intervention on Children With Neurologically Based Language Impairments: An Early Stage Study. *Journal of Speech, Language, and Hearing Research, 53*(4), 961.

Phillips, Beth M, Tabulda, Galiya, Ingrole, Smriti A, Burris, Pam Webb, Sedgwick, T Kayla, & Chen, Shiyi. (2016). Literate Language Intervention With High-Need Prekindergarten Children: A Randomized Trial. *Journal of Speech, Language, and Hearing Research, 59*(6), 1409-1420.

Proctor, C. Patrick, Carlo, M., August, D., & Snow, C. (2005). Native Spanish-Speaking Children Reading in English: Toward a Model of Comprehension. *Journal of Educational Psychology, 97*(2), 246-256.

Proctor, C. Patrick, & Louick, R. . (2018). Development of vocabulary knowledge and its relationship with reading comprehension among emergent bilingual children: An overview. In A. Bar-On & Dorit Ravid (Eds.), *Handbook of communication disorders. Theoretical, empirical, and applied linguistics perspectives*. Berlin: De Gruyter Mouton.

Purcell-Gates, Victoria. (1988). Lexical and Syntactic Knowledge of Written Narrative Held by Well-Read-to Kindergartners and Second Graders. *Research in the Teaching of English, 22*(2), 128-160.

Reese, Elaine, Suggate, Sebastian, Long, Jennifer, & Schaughency, Elizabeth. (2010). Children's oral narrative and reading skills in the first 3 years of reading instruction. *Reading and Writing, 23*(6), 627-644.

Reilly, J., Wasserman, S., & Appelbaum, M. (2013). Later Language Development in Narratives in Children with Perinatal Stroke. *Developmental Science, 16*(1), 67-83.

Roth, Froma P., Speece, Deborah L., & Cooper, David H. (2002). A longitudinal analysis of the connection between oral language and early reading. *Journal of Educational Research, 95*(5), 259-272.

Roth, Froma P., Speece, Deborah L., Cooper, David H., & Paz, Susan De La. (1996). Unresolved Mysteries: How do Metalinguistic and Narrative Skills Connect with early Reading? *Journal of Special Education, 30*(3), 257-277. doi:10.1177/002246699603000303

Ryder, Janice F, Tunmer, William E, & Greaney, Keith T. (2008). Explicit instruction in phonemic awareness and phonemically based decoding skills as an intervention strategy for struggling readers in whole language classrooms. *Reading and Writing, 21*(4), 349-369.

Spencer, Trina D, Kajian, Mandana, Petersen, Douglas B, & Bilyk, Nicholas. (2013). Effects of an individualized narrative intervention on children's storytelling and comprehension skills. *Journal of Early Intervention, 35*(3), 243-269.

Suggate, Sebastian, Schaughency, Elizabeth, McAnally, Helena, & Reese, Elaine. (2018). From infancy to adolescence: The longitudinal links

between vocabulary, early literacy skills, oral narrative, and reading comprehension. *Cognitive Development, 47*, 82-95. doi:https://doi.org/10.1016/j.cogdev.2018.04.005

Tannen, Deborah. (1982). *Spoken and written language: Exploring orality and literacy* (Vol. 32): ABLEX Publishing Corporation.

Tunmer, W. E., & Chapman, J. W. (2012). The simple view of reading redux: vocabulary knowledge and the independent components hypothesis. *Journal of learning disabilities, 45*(5), 453-466.

Uchikoshi, Yuuko, Yang, Lu, & Liu, Siwei. (2018). Role of narrative skills on reading comprehension: Spanish–English and Cantonese–English dual language learners. *Reading and Writing, 31*(2), 381-404.

Vellutino, F. R., Tunmer, W. E., Jaccard, J. J., & Chen, R. S. (2007). Components of reading ability: Multivariate evidence for a convergent skills model of reading development. *Scientific Studies of Reading, 11*(1), 3-32.

Wallach, Geraldine P. (1990). Magic buries Celtics: Looking for broader interpretations of language learning and literacy. *Topics in Language Disorders, 10*(2), 63-80.

Wallach, Geraldine P, & Ocampo, Alaine. (2017). Comprehending Comprehension: Selected Possibilities for Clinical Practice Within a Multidimensional Model. *Language, Speech, and Hearing Services in Schools, 48*(2), 98-103.

Wellman, Rachel L., Lewis, Barbara A., Freebairn, Lisa A., Avrich, Allison A., Hansen, Amy J., & Stein, Catherine M. (2011). Narrative Ability of Children With Speech Sound Disorders and the Prediction of Later Literacy Skills. *Language, Speech, and Hearing Services in Schools, 42*(4), 561-579. doi:10.1044/0161-1461(2011/10-0038)

Westby, C. E. (1991). Learning to talk, talking to learn: Oral-literate language differences. In C. S. Simon (Ed.), *Communication skills and classroom success* (pp. 334-357). Eau Claire, WI: Thinking Publications.

Westerveld, Marleen F, Gillon, Gail T, & Moran, Catherine. (2008). A longitudinal investigation of oral narrative skills in children with mixed reading disability. *International Journal of Speech-Language Pathology, 10*(3), 132-145.

Woodcock, R., McGrew, K. , & Mather, N. (2001). *Woodcock-Johnson III Tests of Achievement*. Itasca, IL: Riverside Publishing.

Woolpert, Darin. (2016). Doing more with less: the impact of lexicon on dual-language learners' writing. *Reading and Writing, 29*(9), 1865-1887. doi:10.1007/s11145-016-9656-6

Appendix

This is a coded transcript from one of the third-grade children in the study broken up by proposition. LLFs are *italicized*, and errors are in **bold**.

1. **His mom and him** were building a boat as a project
2. and his mom waved goodbye
3. and he wasn't looking
4. he was just walking
5. and he fell into *this* ***little lake***
6. and he and his project got dirty
7. and he came back to school
8. and the teacher *said* what happened?
9. no, he fixed it
10. and then he *told* her that
11. he *accidentally walked* into a puddle with his project.

Total number of words / number of different words: 69 / 45
Morphosyntactic errors: 1 ("his mom and him")
Lexical errors: 1 ("little lake" – should be "puddle")
Literate language features: 4 (1 elaborated noun phrase, 2 mental/linguistic verbs, 1 adverb)