

This literature review primarily focuses on past findings regarding young children's language development. It will set the stage for a project that aims to investigate how children learn nouns and verbs differently during language acquisition, and whether this noun-verb distinction persists on older children and children with cognitive impairment, which affects their language abilities.

### **Noun-verb distinction on language acquisition**

According to the previous research on developmental psychology and linguistics, children's ability to acquire verbs seemed to lag behind their ability to acquire nouns. Young children's abilities to learn (Nelson, 1974), to understand (Gentner, 1975), and to produce nouns (Goldin-Meadow, Seligman, & Gelman, 1976) seemed to be better than verbs at an early stage of language learning. For example, as shown by a series of studies conducted by Waxman and his colleagues (2001, 1995, 2009), infants as young as 12-24 months could successfully map novel nouns to objects, while the same ability for mapping verbs to actions and events did not come up until 24 months of age. In another experimental study (Goldin-Meadow, Seligman, & Gelman, 1976), two-year-olds showed a better ability to both comprehend and produce nouns than verbs. This noun-verb distinction does not only persist across different ages at the early stage of development, but it also seems to appear in languages other than English. For instance, in a cross-cultural study by Imai et al. (2008), 3-and 5-year-old children whose mother tongues are either Japanese, English, or Chinese all exhibited better abilities to generalize novel nouns than novel verbs despite of nuanced differences in the process of learning novel words.

In order to explain this pattern in noun and verb acquisition, many hypotheses have been proposed by linguists and psychologists. In the book *Language Development: Language, Thought, and Culture* by Gentner (1982), two theories - the Natural Partitions hypothesis and the Linguistic Relativity theory - were compared to aim to explain this pattern. The first hypothesis claims that there is a linguistic distinction between nouns and predicate terms such as verbs and prepositions. In our perceptual world, concrete concepts, represented using nouns in general, are easier to grasp than abstract concepts of actions, change-of-state, or causal relations conveyed using verbs. On the other hand, Linguistic Relativity theory is a counterview of the previous, and it argues that there is no perceptual difference in viewing concrete versus abstract concepts. According to this theory, nouns are learned before verbs in English because English is a noun-centered language, and this pattern may be different on children in other languages that are verb-centered such as Chinese and Japanese, a belief that was later refuted by cross-cultural studies such as Imai et al. (2008).

The idea of Natural Partitions was extended in McDonough et al. (2011) to suggest that, because nouns represent more concrete concepts, they are generally more imageable than verbs that represent abstract terms. Therefore, the term word imageability was defined to measure the ease for a concept to evoke a mental image. Findings suggested that imageability of a word was negatively correlated to the age of acquisition: the easier for a word to evoke a concrete mental image, the earlier it could be acquired by children (McDonough et al., 2011). A relevant view was proposed by Leddon et al. (2011), who argued that it would take longer for children to verbs because verbs convey more information than nouns. In other words, in order to comprehend a verb, a child does not only need to understand the action itself but also the arguments that the

verb acts on and the relationship between them. Both claims by McDonough et al. (2011) and Leddon et al. (2011) have supported the idea that the noun-verb distinction pattern in language acquisition relates to how children perceive the world. Therefore, by exploring this learning pattern more closely, psychologists would better understand how children gradually learn language structures as well as learn to perceive and to describe the world.

### **Language Learning and Language Impairment**

Although plenty of studies have been conducted to investigate the noun-verb distinction in language acquisition, many of them share two major limitations. First, many early studies consider this learning pattern to be distinctively a difference between nouns and verbs. Some recent evidence posited that the underlying mental representation of words might be a more influential driving factor of the age of their acquisition than whether it is a verb or a noun (McDonough et al., 2011). In addition, Gentner (1982) summarized words to four types - nominal, intermediate, predicate, and expressive, instead of simply nouns versus verbs, when studying early language learning in order to find the underlying mechanism that makes verbs easier to acquire by young children. Specifically, nominal terms have concrete object references; predicate terms refer to actions, change of state, or other predicate notions and are mainly verbs and prepositions; expressive terms directly portray feelings and thoughts; and, finally, intermediate terms have ambiguous usage. According to Gentner (1982), nominal words were learned earliest and followed by intermediate words, while other verb-like predicate and expressive terms entered considerably later. However, Gentner's findings (1982) were primarily based on case studies, and linguists and psychologists still lack the knowledge about what characteristic of a word, in general, predicts the average age of its acquisition.

Second, due to the lack of data available, most linguists studied this pattern of language acquisition on children with normal language abilities. Though some neuroscientists studied noun-verb processing on patients with mental disorders such as aphasia and amnesia (Alyahya, 2018), most are conducted on adults. The literature on how language impaired children learn and use language is largely missing in the field of developmental psychology. However, knowing the differences between the language learning process of normal versus language impaired children can give crucial insights to the understanding and the treatment for language impairment. It could help clinicians to better explain what hinders language impaired children to acquire a complete language system and, thus, come up with efficient treatments to facilitate their language learning. Therefore, this current project would utilize the open-sourced data from the database Childes (<https://childes.talkbank.org/>) and the corpus used by Gillam (2004) to compare the language acquisition pattern between children with and without impaired language abilities.

In conclusion, this article reviews the literature on the noun-verb distinction pattern in children's early language acquisition. In general, consistent results were reported to suggest that infants across culture tend to learn nouns before verbs. Among the two early hypotheses, Natural Partitions and Linguistic Relativity, the latter was refuted by cross-cultural empirical studies. But there is also not sufficient evidence to support the first. The underlying reason for certain types of words to be acquired earlier than others remains controversial in the field of developmental psychology. Moreover, whether language impaired children showed a similar trend is unknown. The literature seems to overlook the population of children with impaired language abilities. Therefore, the proposed study will utilize the Gillam corpus on Childes (2004) to examine the

characteristics of the first-learned words in order to give implications to future developmental and clinical research on language development.

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