results were expected insofar as agreement reflects a structural relationship between sentence subjects and verbs, and the correct form must reflect the number feature of the grammatical subject. In contrast, grammatical morphemes unrelated to agreement marking (e.g., progressive *–ing*, and thematic *of*) were not related to intervention gains. These findings demonstrate the importance of understanding the relationships that exist between specific grammatical structures as a means of determining readiness for targets of grammatical intervention and building the necessary foundation for subsequent grammatical development.

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See Also: Assessment of Language Abilities; Auxiliary and Modal Verbs; Finite Verbs; Genetic Basis of Language Development and Impairment; Grammaticality Judgment Task; Intervention for Child Language Impairments; Late Talkers; MacArthur-Bates CDI; Milestones in Language Development; Specific Language Impairment (Overview).

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Grammatical Gender

Grammatical gender is a system found in many languages. It assigns all nouns (including inanimate ones) to noun classes, marking neighboring words for agreement. Languages differ in the number of gender classes and in the range of elements that agree in gender with the noun. In Hebrew, for example, verbs and adjectives are marked for gender, while in Spanish and French, articles also have to agree in gender with the nouns they precede (e.g., *la pelota* [the—feminine, ball—feminine] versus *el vaso* [the—masculine, glass—masculine]). Gender assignment affects agreement between the noun and all the elements that are syntactically related to it, resulting in agreement patterns that can be local (between articles and nouns) or nonlocal (between a noun and a pronoun that refers to it). In all languages that mark gender, knowing a noun's gender is essential for correct sentence construction.

Grammatical gender is different from natural gender. Natural gender is the distinction (found in all languages) between masculine and feminine entities (e.g., boy versus girl). Grammatical gender is a linguistic category: It is assigned to all nouns (including inanimate ones) and can have more than two classes. Unlike natural gender, the assignment of grammatical gender is largely arbitrary and differs across languages (e.g., *table* is feminine in Spanish but masculine in Hebrew). Languages differ in the number of gender classes they have (e.g., two in Spanish, three in German, and 23 in some Bantu languages) and in the reliability and transparency of the cues to class membership. To master this arbitrary system, children need to learn each noun's gender and how it affects agreement patterns with other elements in the sentence. The acquisition of grammatical gender offers insight into the way children learn the regularities and exceptions of the language they are exposed to.

Languages differ with respect to the gender cues they provide learners. In many languages, there are phonological cues to class membership: Nouns belonging to the same class have similar form. In Spanish, for instance, most nouns ending in *–o* are masculine. In other languages, there are semantic cues to class membership, with nouns of the same class

having similar meaning (only humans or only plants). Phonological and semantic cues are probabilistic and cannot always correctly predict a noun's gender; for example, nouns can be phonologically marked as one gender but belong to another. Distributional information is another cue to gender assignment: Agreement patterns reveal if a noun is masculine or feminine (e.g., in Spanish, the article is a perfect predictor of the noun's gender). While generally more reliable, distributional cues can also be inconsistent. In Hebrew, for instance, plural agreement may indicate one gender, while adjective agreement will indicate another (e.g., *efronot gdolim* [pencils—feminine, big—masculine]). The reliability and availability of cues to gender assignment differ across languages, a difference that affects how these systems are acquired.

Children master grammatical gender relatively early and make few errors in spontaneous speech. By the time they start producing articles (around age 2), children mostly produce the correct article for a given noun. Correct agreement marking on verbs and adjectives is also learned early relative to other morphological domains.

Corpus studies of gender agreement in a range of languages (among them Hebrew, German, Russian, French, Spanish, and Bantu) suggest that children's production is mostly error free by the time they are 3 years old, even for languages with many gender classes. Children's accuracy is affected by the regularity and consistency of the available cues. Within languages, nouns that have more reliable and transparent cues to gender assignment are acquired earlier. In languages (like Spanish or Hebrew) where the phonological form of the noun is predictive of its gender, children are more accurate with regularly marked nouns (ones that conform to the generalization) than irregularly marked nouns (ones whose phonological forms don't reflect their gender assignments). They are also more accurate with nouns that have consistent agreement patterns, that is, where all distributional cues point to the same gender. Across languages, learning is facilitated when the phonological cues to class membership are more regular and transparent (though even nontransparent systems, like that of French or German, are acquired by the age of 4).

Children's knowledge of the various cues to gender in their language can be evaluated by asking them to attribute gender to novel nouns. Using this method, we can ask which cues children are sensitive to and how this sensitivity changes across development. While early studies suggested that children's gender assignment is initially semantically based, more recent work illustrates children's early sensitivity to phonological and distributional cues. Children's attribution of gender is sensitive to phonological cues even in languages (like French) where there are multiple noun endings that differ in the degree to which they predict a noun's gender. Children's performance is also affected by complex distributional patterns, like the relative frequency of noun classes and the reliability of different cues to gender assignment.

Children's knowledge of grammatical gender is also reflected in their ability to use gender information to guide language processing in real time. In languages that mark gender on articles (like Spanish or French), adult speakers use this information to process upcoming nouns: They anticipate a feminine noun when they hear a feminine-marked article. Young Spanish-speaking children (age 3) can already use the gender information on articles in a similar way. In a looking-while-listening paradigm (in which children look at pictures while hearing sentences), children were faster to recognize the correct noun on trials when the two objects differed in gender. Similar results have been found with young French-learning toddlers (2 years old). As in production, children's sensitivity to gender information is manifested early on.

Interestingly, the process of acquiring a grammatical gender system seems different in first (L1) and second (L2) language learning. While children learning their first language master grammatical gender relatively early, L2 learners have persistent difficulty with grammatical gender, even after extensive exposure. Native and nonnative speakers also differ in their ability to use gender information in online processing. Unlike native speakers (adults and young children), L2 learners do not use the gender information conveyed by articles to anticipate the subsequent noun and seem to treat the article and noun as a less cohesive unit than do native speakers. These differences are studied as a way to shed light on the different learning mechanisms involved in first and second language learning.

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See Also: Chunk-Based Language Acquisition; Distributional Knowledge and Language Learning; Grammatical Categories; Long-Distance Dependencies; Morphological Development.

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Grammaticality Judgment Task

In a grammaticality judgment task, participants are presented with a sentence, phrase, or individual word (most often in spoken form but sometimes written) and asked to rate its grammatical acceptability. Adults can be asked directly to make a judgment regarding acceptability (although *grammaticality* and related terms are usually avoided because the aim is to tap into speakers' intuitions about what sounds right, rather than their knowledge of explicit grammatical rules of the type that are sometimes taught in schools). Children are typically asked to judge whether a particular speaker (generally a puppet or toy, as children may be reluctant to correct an adult) said it right or whether his or her speech sounded a bit silly.

Children may be asked to provide either binary or graded judgments. In the former case, children have only two possible responses. A number of different scenarios are commonly used. For example, children might be asked to classify the utterances of a single character as either right or wrong (or a bit silly) generally by either (1) selecting a card showing a tick or a cross, or (2) rewarding or punishing the character (e.g., by feeding him a cookie or a rag). Alternatively, children might be asked to listen to two characters producing different forms of the same utterance—for example, one correct, one ungrammatical—and to choose the one who said it better (e.g., by pointing to or rewarding this character). In the case of graded judgments, children are given three or more options. In perhaps the most commonly used method, children place a counter on a color-coded smiley-face scale with five faces ranging from saddest to happiest, corresponding to *wrong, wrong but not terrible, a little bit wrong and a little bit right or somewhere in between, good but not perfect,* and *right*.

The main advantage of binary judgments is that they can be obtained from children as young as 2 years 4 months (as compared with 4 years for graded judgments). The main advantage of graded judgments is that they provide a within-subject measure of the relative acceptability of different forms (including, for example, two forms that would both be rated as wrong in a binary judgment task). However, the choice of a binary versus graded task is not simply a question of methodology. Some theoretical accounts view the adult grammar as classifying each potential utterance as either possible or impossible (in which case only a binary judgment can ever be meaningful), while others argue that grammatical knowledge is inherently probabilistic.

As an example of a domain in which grammaticality judgment tasks are often used, consider overgeneralizations of grammatical constructions, which occur when a child uses a verb in a construction in which it is not permitted in the adult grammar (e.g., *The clown laughed the boy*). Suppose that the goal is to test the prediction of one particular theoretical account that such errors will be rated as less unacceptable when they occur with lower-frequency verbs (e.g., *The clown giggled the boy*). No comprehension measure (e.g., act out, preferential looking, or pointing) would allow for an appropriate test of this prediction, as there is no reason to believe that a correlation exists between interpretability and acceptability (indeed, both sentences are readily interpretable). A production task would be more suitable, assuming that it were somehow possible to place the child in a suitably constraining discourse scenario. However, this task would still provide only a rather indirect measure of acceptability. For example, a child might produce an utterance that he or she knows to be less than fully acceptable (e.g., *The clown giggled the boy*) if no suitable alternative comes to mind (e.g., if she