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Time-Related Grammatical Use by Children with SLI Across Languages: Beyond Tense

Laurence B. Leonard

Department of Speech, Language, and Hearing Sciences, Purdue University.

Abstract

Purpose—For years, investigators have studied the use of tense by children with specific language impairment (SLI). This review article provides a summary of research on the use of other time-related grammatical forms by these children.

Methods—The literature on children's use of grammatical and lexical aspect, modal verbs, and temporal adverbs is reviewed. Findings from children with SLI acquiring a range of different languages are considered.

Results—Grammatical aspect and lexical aspect appear to be special weaknesses in children with SLI, and problems with lexical aspect may also have an adverse effect on these children's ability to use past tense morphology. Although children with SLI are below age level in their use of modal verbs and temporal adverbs, the available evidence suggests that these weaknesses are no greater than these children's more general limitations with language.

Conclusions—The evidence thus far indicates that time-related notions farther on the morphosyntactic end of the language continuum (aspect) are more problematic for these children than those time-related notions (modals, temporal adverbs) that include a pragmatic and/or semantic component. In some languages, aspect may prove to be a useful clinical marker of this disorder.

Keywords

specific language impairment; aspect; modal verbs; temporal adverbs

Across a range of languages, tense represents a major obstacle for children with specific language impairment (SLI). The chief symptom is a protracted period of inconsistent use of inflections and function words that mark present or past tense. At approximately five years of age, these children often make less use of present and/or past tense forms than three-year-old typically developing children matched according to language test scores or mean length of utterance (MLU). Differences favoring the younger typically developing children have been reported for Danish (Vang Christensen & Hansson, 2012), Dutch (Blom, Vasi, & de Jong, 2014; de Jong, 1999), English (Conti-Ramsden, Botting, & Faragher, 2001; Hoover,

Correspondence should be addressed to Laurence B. Leonard, Department of Speech, Language, and Hearing Sciences, 715 Clinic Drive, Purdue University, West Lafayette, IN 47907, USA. xdxl@purdue.edu.

Declaration of Interest

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Storkel, & Rice, 2012), Finnish (Kunnari, Savinainen-Makkonen, Leonard, Mäkinen, Tolonen et al., 2011), German (Ott & Höhle, 2013), Hungarian (Lukács, Leonard, Kas, & Pléh, 2009), and Swedish (Hansson, Nettelbladt, & Leonard, 2000), among others. In Romance languages such as French and Italian, these differences are more likely to be seen for tense-marked copula and auxiliary forms than for verb inflections (Leonard, Bortolini, Caselli, McGregor, & Sabbadini, 1992; Paradis & Crago, 2001). In some of these languages, tense is fused with agreement, but differences are still seen when the morpheme marks tense only, as in English or Swedish past tense (Leonard, Hansson, Nettelbladt, & Deevy, 2004; Oetting & Horohov, 1997).

Formally defined, tense represents the temporal relationship between the time of the event that is being referred to and some other event (Bybee, 1985). Often this other event is the time of speaking. For example, in *Sam mowed his grandmother's lawn*, the event of mowing the lawn presumably preceded the utterance that described it. However, in *We heard that Sam mowed his grandmother's lawn*, both events (the mowing, and hearing of it) occurred in the past but one event nevertheless preceded the other. Children's problems with tense, then, can be assumed to rest with how to express – or how to express on a consistent basis – temporal relationships of this type.

Some of the most prominent accounts of tense-related deficits in children with SLI assume that these children's grammars include the category of tense. According to these accounts, the problem is that these children are slow to acquire the principle that tensed verbs are obligatory in main clauses (e.g. Rice, 2003). Until they acquire this principle, children with SLI go through a protracted period during which they treat tense as optional, producing the correct tensed form on one occasion (e.g. *I watched a movie last night*) and a nonfinite verb form in a similar context on another occasion (e.g. *But I already watch it last week*).

However, tense is not the only time-related grammatical notion, and until these children's abilities with these other notions are fully explored, we will not know if their time-related difficulties are confined to the grammatical category of tense, or extend to other categories. In this review paper, we examine the status of other time-related categories in the speech of children with SLI, namely, aspect, modality, and temporal adverbs. SLI data from several different languages will be reviewed with a focus on children approximately five years of age – an age at which problems with tense are quite salient in this population.

Aspect

Whereas tense pertains to the location of an event in time, aspect concerns the temporal distribution of the event. Aspect is often subdivided into 'grammatical aspect' (sometimes known as 'viewpoint aspect') and 'lexical aspect' (referred to also as 'situation aspect') (Smith, 1997). Within grammatical aspect, a distinction is made between perfective aspect and imperfective aspect (Bybee, 1985). Sentences expressing perfective aspect contain predicates that specify an end point or completion. For sentences expressing imperfective aspect, the predicate has no explicit or implicit end point or completion. In English, the progressive construction (with *-ing* as the inflection on the lexical verb) marks imperfective aspect. For example, *Sheila was reviewing the revised manuscript* emphasizes an ongoing

action while providing no hint that the action was completed, even though the auxiliary (*was*) indicates that the event occurred in the past. Unlike imperfective aspect, perfective aspect in English is often bound up with tense and cannot be easily isolated. For example, the past-tense utterance *Sheila reviewed the revised manuscript* implies an end point – that Sheila completed the review. ('Perfect' forms, as in the present perfect utterance *Sheila has reviewed the revised manuscript*, approximate perfective aspect but are classified as forms specifying events of current relevance and are distinguished from true perfective aspect. The same seems to be true for perfect forms in French, Italian, and varieties of German, see Comrie, 1976.) As will be seen, some languages allow for a clearer distinction between past tense and perfective aspect.

'Lexical aspect' refers to aspectual notions conveyed by the meaning of the verb, often in combination with the larger predicate. Within lexical aspect, a distinction is often made between telic events and atelic events (Comrie, 1976). Telic events specify an end point or completion; atelic events do not. The importance of the larger predicate can be seen in the contrast between the telic utterance, *She walked to the store* and the atelic utterance, *She walked around*. The distinction between telic events conveyed by the verb alone and telic events conveyed by the verb within the larger predicate has been referred to as a distinction between inherently telic verbs and compositionally telic verbs (see Penner, Schulz, & Wymann, 2003). For example, in German, the verb *aufmachen* 'open' is inherently telic. However, the telicity of the verb *essen* 'eat' will depend on the larger predicate. When its object has a determiner, as in *den Käse* 'the cheese', the larger predicate will be telic. With no determiner (as in *Käse* 'cheese'), an atelic interpretation is more appropriate.

Although the telic – atelic distinction has been central to studies of lexical aspect, additional event details may influence children's interpretations. Shirai and Andersen (1995) noted that children are especially drawn to telic events that have a brief duration and are highly salient (as in closing a window). Conversely, events are more likely to be viewed as atelic when they have considerable duration (as in playing cards).

Grammatical Aspect Findings

In English, the progressive inflection *-ing* constitutes the only morpheme that uniquely expresses (imperfective) aspect. Traditionally, this morpheme has been viewed as relatively problem-free in children with SLI (e.g. Ingram & Morehead, 2002; Rice & Wexler, 1986) given that productions such as *Mommy running* and *Daddy drinking coffee* to describe ongoing events are common in the speech of these children. (The absence of auxiliary *be* forms in the same utterances has been assumed to reflect the children's problems with tense/agreement in particular.) However, along with its aspectual role, the present progressive construction also serves as a type of default construction to describe actions in the present. For example, a picture might be described with the sentence *A man is smelling a rose* even though the action, and not its continuous nature, is of interest. In other languages, the verb used in the description of this picture might be expressed in simple present tense form. For this reason, it is not clear that English-speaking children interpret the *-ing* construction as communicating progressive aspect. (In other languages, too, a verb form ordinarily serving

one function is sometimes used for another; de Jong, Blom, and Orgassa [2013] provide a few examples.)

Given this pattern of use in English, Leonard et al. (2003) asked whether the use of this inflection by English-speaking children with SLI can be safely interpreted as an intention to express progressive aspect or, rather, simply reflects a manner of describing events in the present. These investigators devised tasks involving activity verbs that could be acted out with considerable duration (e.g. *dance, drive, march, skate*). Descriptions of these activities would likely involve the use of the present progressive (e.g. *is dancing*) when produced as the activity was taking place, and the past progressive (e.g. *was dancing*) when produced immediately after the activity.

The descriptions provided by the children with SLI were compared to those of their typically developing age mates and younger children matched according to MLU. Although all three groups were more likely to use the inflection *-ing* when describing the events as they were occurring, even the children with SLI showed substantial use of *-ing* when describing events that had just occurred. For this reason, Leonard et al. suggested that these children's descriptions could probably be interpreted as use of progressive aspect, independent of tense.

This interpretation may be correct, but there are certain details that make the case less compelling. For example, *is/are Verbing* was often produced where *was/were Verbing* was required. Thus, the degree to which *-ing* was being treated as distinct from (in this case, erroneous) present tense is not clear.

Owen (2011) examined English-speaking children's ability to use tense and aspect together in utterances containing two clauses. She compared the probe responses of children with SLI, same-age peers, and younger typically developing children. The children with SLI often omitted tense markers; therefore, to obtain a clearer picture of tense-aspect concordance, Owen restricted her analysis to utterances that contained an overt tense or agreement marker in each clause. When analysis was restricted in this way, the children with SLI did not differ from either of the typically developing groups. Children in all three groups produced utterances such as *The aliens smiled when Froggy was humming*). This finding certainly indicates that children with SLI can use tense and aspect markers in multiple-clause utterances. Owen also noted that in many instances, the two clauses matched in both tense and aspect. This means that there were many utterances such as *The aliens smiled when Froggy hummed* or *The aliens were snoring when Froggy was humming*. These were technically grammatical but did not necessarily reflect adult-like interaction of tense and aspect across clauses.

Cantonese has provided a rather clear view of the role of aspect in SLI. This language employs imperfective and perfective aspect but makes no distinctions according to tense. This means that distinctions between the Cantonese equivalents of, say, 'She is writing a letter' and 'She was writing a letter' are made through temporal adverbs and/or context. The same is true for a distinction such as 'She has written a letter' and 'She will have written a letter' (using here the closest English approximations, the present and future perfect). There

are no inflections in Cantonese. Aspect is expressed through monosyllabic function words that follow the verb in the sentence. These forms, like other lexical and function words in this language, carry one of six contrastive tones. For example, the imperfective marker *gan2* which expresses an ongoing activity, and the perfective marker *zo2* which expresses completion of an action, make use of a high rising tone (the numerical designation indicates the type of tone used, following the system of the Linguistic Society of Hong Kong, 1994).

Stokes and Fletcher (2000) compared children with SLI and younger children matched for MLU on their use of the perfective aspect marker *zo2* in spontaneous speech. They found that the younger typically developing children used the aspect marker with a much wider range of verbs. In a subsequent study, Stokes and Fletcher (2003) compared children with SLI and same-age typically developing children on their use of six different aspect markers. Along with examining the children's spontaneous speech, these investigators administered a sentence repetition task and a video narration task. The two groups showed similar levels of aspect marker use on the sentence repetition task. However, on the video task and in spontaneous speech, the age controls not only made greater use of aspect markers, they also produced them with a wider variety of verbs.

One complicating detail about assessing aspect use in Cantonese is that, for every sentence that contains an aspect marker, it is possible to find a context in which the same sentence is grammatical without the aspect marker. Therefore, in certain contexts, the absence of an aspect marker will be interpreted by listeners as imprecise or incomplete, but not as ungrammatical. Fletcher, Leonard, Stokes, and Wong (2005) worked around this problem by creating probe items that provided contexts highly likely to evoke the use of aspect markers by typical speakers of the language. A child's non-use of an aspect marker in such contexts could be viewed as aspectually imprecise. Probe items were created for both imperfective *gan2* and perfective *zo2*; *gan2* was tested in both present-time and past-time contexts. Participants were Cantonese-speaking children with SLI, same-age typically developing peers, and younger typically developing children matched according to receptive language test scores.

The results were informative; the children with SLI made less use of the aspect markers than both the age-matched and younger typically developing children. This was true for *zo2*, and for *gan2* in both present-time and past-time contexts. This study seems to provide evidence that aspect can be problematic for children with SLI, given that these children failed to recognize aspectually relevant contexts that even younger typically developing children recognized. The fact that, in Cantonese, aspect is clearly distinct from tense indicates that this insensitivity is related to aspect in particular.

Hungarian offers a different look at the use of imperfective and perfective aspect by children with SLI. In this language, perfective aspect is marked with a prefix whereas the imperfective has no overt marking. Aspect co-occurs with tense, which, in past tense, appears as a suffix. Unlike the case for English, a sentence in past tense without a prefix is interpreted as imperfective. For example, the sentence without the perfective prefix, *Nora szerezte az autót* has the interpretation of 'Nora was fixing the car'. Adding the perfective prefix *meg-*, as in *Nora meg-szerelte az autót*, yields the perfective interpretation, indicating

that the action has been completed. (Agreement suffixes often follow past tense suffixes in this agglutinating language but in third person singular, as in these examples, subject-verb agreement has zero marking and hence the past tense suffix appears in final position. The past tense suffix in these examples (-*te*) is the form employed when the direct object is definite; -*t* is used when the direct object is indefinite.) Hungarian employs several different perfective prefixes (e.g. *meg-*, *le-*, *ki-*); the choice of perfective form is usually verb-specific (e.g. *szerelte* ‘fix’ requires *meg-* but *rajzolta* ‘draw’ requires *le-*).

Using pictures and a sentence completion format, Leonard, Lukács, and Kas (2012) compared children with SLI, same-age peers, and younger typically developing children (matched on language test scores) on their use of imperfective and perfective verb forms. The children with SLI were less accurate than both of the typically developing groups. One might have expected that the children with SLI would be more accurate on imperfective forms, as these forms did not require a prefix. However, the lower scores for imperfective and perfective forms were quite similar, indicating that the children sometimes added a perfective prefix when it was not appropriate to do so. Occasionally the children with SLI used the wrong perfective prefix in a perfective context (e.g. using *meg-* with a verb that required *le-*), but such errors were no more frequent than in the younger control group. Thus, the group difference cannot be attributed to a general tendency for the SLI group to omit prefixes or for these children to be confused about which perfective form to use with a particular verb. Instead, the children with SLI seemed to have difficulty discerning the conditions under which the imperfective or the perfective was to be used.

Arabic is another language that makes use of grammatical aspect. In this language, however, aspect is built into the verb conjugation, integrated with agreement markers. As seen in Table 1, the imperfective is formed with a prefix added to the root (*k-t-b* in this example), but the perfective is formed with no such prefix. The imperfective and perfective differ in other ways as well. For the imperfective, the difference between third person singular masculine and third person singular feminine rests in a change in the prefix (from *yiktub* to *tiktub*) but the same distinction in the perfective involves a change in the suffix (from *katab* to *katabat*). The imperfective and perfective also differ in the particular vowels that appear between the root consonants.

Abdalla and Crago (2008) examined the spontaneous speech of Arabic-speaking children with SLI, same-age controls, and younger children matched for MLU. These investigators found that the children with SLI were less accurate than both the younger and older controls in the use of both perfective and imperfective aspect, even when aspect was scored independent of agreement. Rather than confusing one type of aspect for the other, the children with SLI were more likely to use an imperative form (e.g. *ṣuktub*). Arabic does not employ infinitives and because the imperative form is relatively simple, Abdalla and Crago suggested that this form might have served as a type of default. This error pattern makes it difficult to know whether the children’s difficulties applied to aspect in particular or to the rather complex verb paradigm of Arabic more generally. To be sure, one casualty was the expression of aspect. However, aspect might not have been the sole weakness.

The evidence from studies of grammatical aspect reveal weaknesses in children with SLI that, in most studies, place them below the level of younger typically developing children acquiring the same language. This pattern is especially noteworthy given that the languages studied thus far differ markedly in how grammatical aspect is marked and in whether aspect operates independently from tense.

Lexical Aspect Findings

Studies of lexical aspect in SLI can be divided into those that examine children's understanding of lexical aspect itself (such as the distinction between telic and atelic verbs), and those that examine the influence of lexical aspect on other details of the children's grammar (such as the use of past tense). Lexical aspect itself was the focus of a series of studies in German that compared children with SLI and typically developing peers in their sensitivity to end-point events as expressed in telic verbs. Schulz, Wymann, and Penner (2001) provided examples of the early verb prefixes used by five young typically developing children and four children with SLI. The typically developing children used *auf* and/or *zu* in contexts consistent with the inherently telic *aufmachen* ('open') and *zumachen* ('close'). In contrast, the children with SLI first used verb prefixes that were deictic in nature (e.g. *rauf*) with meanings such as 'up' and 'down'.

To gain a clearer understanding of the interpretation of telic verbs by German-speaking children with SLI, Schulz et al. (2001) presented pairs of pictures to children with SLI and younger control children. The picture pairs depicted a hand moving toward a closed container (e.g. a box) and a hand moving away from either the now-opened container, or the container still closed. The children were asked *Hat sie sie aufgemacht?* 'Did she open it?' Only the typically developing children reliably responded with 'no' when the container remained closed, a finding suggesting that the children with SLI did not view the end state as a necessary property of the telic verb.

Penner, Schulz, and Wymann (2003) reported similar findings using older as well as younger German-speaking children with SLI, and Schulz and Wittek (2003) obtained the same results using a wider range of verbs. In the latter study, typically developing children required an end point in response to telic verbs, as in *Hat das Mädchen 'se zugemacht?* 'Did the girl close it?' but not for atelic verbs as in *Hat das Mädchen gefelt?* 'Did the girl sweep?' The children with SLI, in contrast, often responded with 'yes' even for telic events that had not reached an end point.

Studies in English also suggest that children with SLI may differ from their peers in their sensitivity to telic events. Kelly and Rice (1994) tested children on their interpretation preferences of novel verbs. When given choices between a motion interpretation (e.g. moving up and down) and a distinct end point interpretation (e.g. breaking into pieces), typically developing children preferred the latter, whereas children with SLI displayed no preference.

Leonard and Deevy (2010) also studied English-speaking children's sensitivity to telic events, in this case, as conveyed through compositionally telic verbs, as in *Buzz was drawing a happy face*. In their task, toy characters (e.g. Buzz Lightyear) were made to walk

along a path and then stop to perform an action (e.g. draw a happy face). In one condition, the character completed the action and then continued along the path. In another condition, the character resumed walking along the path without having completed the action. In each case, after the event, the child was asked to indicate the point along the path where the action took place (e.g. *Show me where Buzz was drawing a happy face*). Leonard and Deevy compared the performance of children with SLI and younger typically developing children matched on a test of syntax comprehension. The typically developing children were more accurate overall than the children with SLI but they were more successful when the action in the past had been completed rather than left incomplete. The children with SLI showed the same (lower) scores regardless of condition; these children did not appear to treat completion as a crucial characteristic of telic verbs.

Other studies have asked whether lexical aspect might have an influence on the use of tense morphemes by children with SLI. This question is especially relevant for languages such as English where both inherently and compositionally telic verbs are often expressed in past tense forms. Given the inconsistency shown by English-speaking children with SLI in the use of verb inflections, Leonard, Deevy, Kurtz et al. (2007) asked whether lexical aspect might be a contributing factor in whether an inflection was used or omitted by these children. These investigators focused on the inflections *-ed* and *-ing*. For each inflection type, they selected verb predicates whose telicity would be more, or less compatible with the inflection. For past tense items, the items were divided into those that were telic, such as *Mickey dropped his book* and *Francine popped the pink balloon* and those that were atelic, such as *Cookie Monster raked leaves* and *Cookie Monster played with Big Bird*. Based on research with young typically developing children, the telic items were expected to be most compatible with the use of *-ed*. For *-ing*, the items were divided in a similar manner, as either atelic, as in *Ernie was singing* and *Franklin was running*, or telic, as in *The clown was knocking over the animals* and *The girls were kicking the balls*. Based on research with typically developing children, the atelic items were expected to be most compatible with the use of *-ing*.

The probe items were administered to children with SLI, typically developing children of the same age, and younger children matched according to MLU. Not surprisingly, the children with SLI used *-ed* in fewer items than either of the typically developing groups. However, the more interesting finding is that, for both the age-matched and younger typically developing children, *-ed* use was more frequent for items consisting of telic predicates than for items composed of atelic predicates. For the children with SLI, there was no difference according to item type, even though their degree of *-ed* use was well above floor level and therefore high enough to detect a difference if one were present.

The results for *-ing* were similar, though the children with SLI differed only from the age-matched children in degree of use. Both groups of typically developing children were more likely to use *-ing* on atelic items than on telic items. The children with SLI, in contrast, showed similar use regardless of item type.

The lexical aspect findings across these studies show a general insensitivity to telic verbs on the part of children with SLI. In both studies of English and German, these children do not

appear to regard a clear end point or completion as a central feature of these verbs. This is true regardless of whether the verbs are inherently telic or compositionally telic.

This insensitivity might also have a bearing on the children's use of past tense inflections. As pointed out by Leonard et al. (2007), given that young typically developing children appear to be especially sensitive to event completion or end points in their early use of this inflection, this sensitivity may put the children on a path toward proper use of past tense, with a gradual re-shaping of the boundaries until they approximate those of the adult grammar. Lacking this early sensitivity, children with SLI may have to contend with a less direct route to past tense development, resulting in a more protracted period of inconsistency.

Modality

Modal verbs (e.g. *can*, *could* in English) are assumed to carry the feature of tense (e.g. Radford, 1997), like other auxiliary verbs, but function to qualify a proposition in some way (Bybee, 1985). These qualifications can be based on reference to norms ('deontic modality'), as in *Jill must enroll in the class*, factual knowledge ('epistemic modality'), as in *Birds can fly*, or personal ability ('dynamic modality'), as in *Dante can run really fast*. Frequently, modal verbs are described in a more straightforward manner, using terms such as 'ability', 'permission', and 'possibility'. Indeed the literature on children with SLI (as well as the broader child language literature) makes use of these types of terms.

Although notions such as 'ability' and 'possibility' are easy to convey, they are not, in practice, always easy to separate. For example, the sentence *I could send her a text message if you'd like* not only indicates the possibility of sending a text message but also the speaker's ability to do so. Even when functions are more clearly distinguishable, they sometimes make use of the same modal verbs. For example, the modal used in the above example, *could*, can also be used to request permission, as in *Could I borrow your car tonight?* A final detail of importance is that the same modal can convey past tense in one context and non-past in another. Consider the different uses of *could* in the sentences *I could read well without eyeglasses when I was young*, *but can't do that now* and *I could call to make reservations if you'd prefer*. The first sentence reflects an ability function in the past whereas the second reflects possibility and ability in the future. These complications render the interpretation of children's use of modals somewhat tricky.

Modals differ from other auxiliary verbs that carry the feature of tense because, by virtue of expressing notions such as permission and ability, they have a degree of pragmatic force and/or semantic substance. This raises the interesting question of how children with tense problems deal with their intent to express the notions associated with modals. For example, in English, auxiliary *be* and *do* forms are often omitted, but, as these forms primarily mark tense and agreement, there is little lost in substance. This would not be true if modals were omitted.

The time-related question pertaining to modals, then, is how modality might be expressed in the face of problems with tense marking. There are several possibilities. First, modals might

be produced to express modality but tense might remain unspecified, thus representing a modal that is nonfinite. A second possibility is that, to avoid marking tense, the child might omit the modal, thus sacrificing the expression of modality. Third, the child might attempt to convey modality through use of the lexical verb alone, with no modal included in the utterance. Each possibility is highly plausible. For example, some child language researchers have proposed that, at least in certain languages, when children produce sentences with a subject and a lexical verb in infinitive rather than finite form, such sentences have a modal interpretation – that the event described will, can or should occur (Ingram & Thompson, 1996). This type of interpretation is most commonly seen in studies of children acquiring languages such as Dutch and German (Hoekstra & Hyams, 1998), though, even in these languages, some infinitives are seen in non-modal contexts (Blom, 2008). The goal of some of these studies has been to argue that young children's alternation between finite and nonfinite forms may not be haphazard, but instead dictated in part by the child's communicative intent. However, if it can be argued that an infinitive used in a finite context (e.g. *Peter kochen* 'Peter cook' in German) is actually intended to reflect a modal meaning, it can just as reasonably be argued that the child omitted a modal verb, and along with it its modal meaning, given that the lexical verb takes the infinitive form when a modal is present (e.g. *Peter kann kochen* 'Peter can cook').

Modality Findings

Leonard et al. (2003) examined the use of modals by English-speaking children with SLI. In assessing these children's ability to use modals, these investigators asked whether, in cases of failure, the children's resulting utterances would take the form of subject + infinitive (e.g. *She call her mommy*) that is so characteristic of these children's everyday speech. The children recruited were highly inconsistent in their use of tense/agreement forms such as third person singular *-s* and auxiliary *be* forms. The modals were tested in contexts that reflected, simultaneously, both ability and possibility. Children were presented with scenarios using toys, in which a problem (e.g. a police officer trying to figure out how to rescue a cat from the top of a tree) could be solved by the child thanks to cues placed in plain view (e.g. a ladder placed near the tree). Children's suggested solutions (e.g. *He can climb up the ladder*) were examined. The modal most expected in this task was *can*; however, scoring permitted crediting the child with either *can* or *could*, given that the latter was also appropriate in the context (e.g. *He could climb up the ladder*).

The use of modals by the children with SLI did not differ from either same-age or younger control children, despite numerically lower scores by the SLI group. The errors that occurred were in the form of omissions (as in *He climb up the ladder*). For all groups of children, *can* was the most likely modal to be used, though *could* was used to some extent, especially by the typically developing children serving as age controls. Overall, the findings were not consistent with the idea that subject + infinitive verb forms are a frequent outcome when children with SLI are faced with a modal context. This finding is especially interesting because the children with SLI had well-documented difficulties with tense/agreement forms. It is certainly possible that, at an earlier point in development, many of these children's subject + infinitive forms were intended to express a modal function. However, at the time of

this study, the (by now) protracted use of subject + infinitive forms by the children with SLI did not seem related to difficulty in the production of modals.

As noted earlier, children's use of modals is no guarantee that these forms reflect tense; it is possible that they are nonfinite expressions of notions such as ability. To assess the specific role of tense in children's use of modals, Leonard, Deevy, Wong, Stokes, and Fletcher (2007) examined the use of modals expressing ability and permission by both English- and Cantonese-speaking children with SLI. As noted earlier, in English, modals are assumed to carry tense; this is not the case for Cantonese, as tense is not employed in this language. For English, the ability task was modeled after that used by Leonard et al. (2003). For the permission task, the children saw scenarios with toys in which a character was allowed to engage in a favorite activity after performing some chore. As soon as the character performed the chore, the children were quizzed about what should happen next. Utterances such as *She can watch TV* were appropriate for these items.

For Cantonese, the ability modal *sik1* and the permission modal *ho2ji5* were examined. The ability modal was elicited by providing children with drawings and a description of what a character was *not* capable of doing, followed by a prompt for the child to complete a sentence stating what the character *was* capable of doing. (e.g. the Cantonese equivalent of 'The fish can't walk, but ...the fish can swim'). The permission modal was elicited in a role-playing task in which the child was to play the role of a grandchild who needed to ask permission to do particular things. In Cantonese, questions follow declarative order (as in 'I can eat?' rather than 'Can I eat?'). Thus, fronting of the modal is not required as it would be in English.

For both English and Cantonese, the children with SLI and a group of younger typically developing children showed very similar use. The difference between the children with SLI and a group of same-age peers (favoring the latter) was significant only for the English data. For English, most productions by children in all three groups were instances of *can*, though the same-age controls showed twice the number of *could* productions as the younger controls and five times more than the children in the SLI group. It is tempting to conclude that the similar scores for the SLI and age-matched groups in Cantonese were due to the fact that, in this language, modals have no tense value and therefore the children with SLI were not faced with this burden. However, the tasks used in Cantonese and English were not identical, so such an interpretation must be made with caution.

In an additional study, Leonard et al. (2007) focused again on English, this time testing the children on the ability function of modals in non-past- and past-time contexts. The non-past-time task matched the task described earlier ('He can climb the ladder'). For the past-time task, scenarios were presented using toys and then a narrator, who forgot his glasses, recounted the scenario. The child was to correct any mistakes made by the narrator after each description, as in 'No, he *could* find his Batmobile'. The non-past-time results matched those of the previous studies, with lower scores for the SLI group than for the age controls, but similar scores for the SLI and younger control groups. However, for past-time, the children with SLI showed much less accurate use than both the typically developing comparison groups. Furthermore, the age-matched and younger typically developing

children scored as high on past-time items as on non-past-time items, but for the children with SLI, the past-time items ($M = 24\%$ correct) were much more difficult than the non-past-time items ($M = 74\%$ correct). Approximately two-thirds of the SLI group's errors were productions of *can* in place of *could*. The remaining errors were omissions.

The findings of this last study certainly implicate past tense as the source of the problems for children with SLI. For example, tense might have been underspecified in the grammars of the children with SLI and these children might have used *can* to express the ability function independent of tense. However, again, some caution should be exercised in interpreting these results. It is possible, for example, that the children with SLI were less familiar with *could* as a lexical item, and thus had no appropriate means of expressing the modal meaning in past tense.

Thus far, it appears that the expression of modal meanings is relatively unencumbered by problems with tense in the speech of children with SLI. If tense causes a drag on these children's use of modals (a possibility given the slight differences between the Cantonese and English findings), it is only minor. Despite their problems with tense, these children do not omit modals on a frequent basis. At the same time, these children do not appear proficient in their ability to vary their choice of modals as a function of tense (past versus present).

A full understanding of the status of modals in the grammars of children with SLI will require data from a wider range of languages. Along with languages such as Cantonese in which modals carry no tense or agreement features, studies might be directed toward languages whose modal forms vary with person, number, and tense. Italian is one such language. For example, the first person singular, third person singular, and third person plural forms of 'can' in present tense are *posso*, *può*, and *possono*, respectively. Might children with SLI over-use the simpler third person singular form (*può*) to express ability or possibility when they have difficulty with tense and agreement? In other languages, modals can operate in yet a different way. As noted by Bol and de Jong (1992), a modal such as 'can' in Dutch is usually followed by a lexical verb in infinitive form (the latter in sentence-final position given the word order rules of Dutch). However, in some contexts, the modal alone is sufficient. For example, whereas *Zij kan dat doen* 'She can do that' is a typical modal construction, *Zij kan dat* 'She can that' (without the infinitive *doen* 'do') can also be appropriate. Earlier, it was noted that modals have a meaning of their own (ability, possibility, permission) apart from their tense designation. In a language such as Dutch, the modal takes on even more substance in cases where the lexical verb is absent. This added substance might facilitate children's ability to use modals.

Temporal Adverbs

Aspect and modality are expressed through verb phrase morphology. This is not the case for another time-related category, temporal adverbs. The study of temporal adverb use, then, might provide an indication of children's ability to express time when there is no requirement to alter the grammatical form of the verb phrase. In a study of English-speaking children, Moore and Johnston (1993) compared five-year-old children with SLI to three

groups of typically developing children, those ages three, four, and five years, on their use of past-time temporal adverbs such as *yesterday* and *last night*. These researchers were especially interested to learn if past-time temporal adverb use by the children with SLI was as limited as the children's use of past tense verb forms. Separate sentence completion tasks were devised to elicit children's productions of each type of grammatical form. Moore and Johnston found that although the use of past tense forms by children with SLI resembled that of the three-year-old typically developing children, their use of past-time temporal adverbs was on par with the four-year-olds. Examination of the children's errors revealed the same pattern as the accuracy data. The children with SLI were similar to the three-year-olds in their frequent use of bare stems (e.g. *kiss* in place of *kissed*) but more similar to the four-year-olds in their adverb errors (e.g. producing terms such as *at night* that were not anchored to past time). Clearly, the children with SLI were not at age level in their temporal adverb use. However, their greater difficulty with past tense suggests that tense was more problematic for these children than the expression of past time in general.

Fletcher et al. (2005) developed a task to assess children's use of the Cantonese temporal adverb *kam4jat6* 'yesterday'. The participants were the same children who participated in the study on imperfective and perfective aspect markers described earlier. The results indicated that the children with SLI made less use of the temporal adverb than the same-age control children, but did not differ from the younger controls. In a sense, this finding parallels that of Moore and Johnston (1993) for English. In both studies, the children with SLI were below age-level in their use of temporal adverbs but were even more limited in their use of the verb-related temporal categories of tense (English) and aspect (Cantonese).

Paradis and Crago (2000) examined the spontaneous speech of French-speaking children with SLI with the goal of comparing the children's use of tense morphology and temporal adverbs. Not surprisingly, relative to a group of same-age typically developing children, the children with SLI had greater difficulty with tense morphology. However, errors in the use of temporal adverbs were exceedingly rare. Because these were spontaneous speech samples, we cannot be certain that the children with SLI could supply adverbs just where they were needed, but the results do suggest that these children tend not to misuse temporal adverbs.

Finally, just as studies have examined the role that lexical aspect might play in the use of past tense by children with SLI, so, too, have investigators asked whether the presence of a temporal adverb might affect these children's use of past tense. Krantz and Leonard (2007) presented English-speaking children with brief stories accompanied by toy characters performing the actions. At the conclusion of each story, the children were presented with a sentence completion item. In half of the items, the experimenter used a temporal adverb in the prompt, as in *A little while ago, Cookie Monster hopped over his lion, and a little while ago, Bert _____ (carried his basket)*. For the other half, the prompt contained no temporal adverb, as in *Woody covered Piglet, and Buzz _____ (opened his bag)*. Although children with SLI were slightly less accurate than younger MLU controls on this task, they, like the younger controls, were less likely to include the past tense marker if a temporal adverb had been included in the prompt. In this task, the children only heard, rather than produced, the temporal adverb. Nevertheless, the presence of the adverb seemed to have an adverse effect on their past tense use. The adverb served as a reminder that the event occurred in the past,

but instead of reinforcing the use of past tense, it seemed to serve as a substitute in many instances. The fact that the same pattern was seen for the MLU control children was unexpected, though these children's past tense use overall was also highly inconsistent (averaging around 67% compared to 57% for the SLI group).

The findings from the studies dealing with temporal adverbs indicate that children with SLI are below age level in the use these forms, but are not as limited in this ability as they are with the use of past tense. One worrisome finding is that, when children are highly inconsistent with using past tense, temporal adverbs may actually serve to suppress past tense use. This possibility merits further investigative attention.

How Broad and Severe are the Time-Related Deficits in SLI?

As we discuss below, there are many additional questions that must be asked before we arrive at a full understanding of the nature of the time-related deficits experienced by children with SLI. However, the available evidence allows for some tentative conclusions. For at least several languages, grammatical aspect appears to be an especially large obstacle for children with SLI, comparable to the significant difficulties with tense documented in earlier studies. Special problems with grammatical aspect were seen: (1) in languages in which aspect is integrally bound with agreement (Arabic); (2) in languages in which aspect co-occurs with but is separable from tense (Hungarian); and (3) in languages in which aspect acts alone as there is no tense or agreement in the language (Cantonese). For English, the data are less clear-cut, though it has not yet been established that progressive aspect is fully independent of tense in these children's speech.

The evidence is also clear that lexical aspect does not play the same role in the speech of children with SLI as it does in the speech of either younger or same-age typically developing children. In studies of both German and English, where typically developing children are sensitive to end points in inherently and compositionally telic verbs, children with SLI are not. It is also possible that this insensitivity slows these children's development of past tense use. Longitudinal studies of both SLI and typically developing groups will be needed to make this determination.

For the other time-related categories explored here – modal verbs and temporal adverbs – the evidence reveals weaknesses more in keeping with these children's broader limitations with language. This is the picture that emerges from the available studies on SLI in Cantonese, English, and French. These children's use of modals and temporal adverbs falls below the level seen for their typically developing age mates, but resembles that seen for younger typically developing children. More serious problems are seen only when tense becomes an interacting factor, such as when English-speaking children must use the modal *could* to express ability in the past. In the case of temporal adverbs, there is a possible negative consequence of these children showing greater strength with adverbs than with past tense; in one study, it was seen that children might rely on a preceding temporal adverb to express past time rather than marking past tense on the verb.

Future research will no doubt refine and expand these initial views on the status of time-related grammatical forms in SLI. Our understanding will be greatly enhanced through study of a wider range of languages. Especially valuable will be the inclusion of additional languages in which aspect occurs with, but is separable from tense, and languages in which only aspect is employed. Languages that vary in how aspect is marked will also be informative. Thus far, we have reviewed data from languages in which grammatical aspect appears as a prefix and as a free-standing function word. However, we have not yet considered languages that employ aspect as a suffix independent of both tense and agreement. Probe tasks or other experimental methods are needed to create obligatory (or at least highly likely) contexts for the use of time-related forms that have eluded investigative study at this point. Finally, the aspect markers, modals, and temporal adverbs examined to date have been those acquired at an earlier age by typically developing children. For a better understanding of the degree to which time-related notions remain as obstacles for children with SLI as they move into the school years, we will need to determine not only whether these children eventually master the earlier-acquired forms, but also whether they eventually gain full control of those forms that are ordinarily acquired after four years of age by typically developing children.

Although much research remains to be done, the evidence thus far suggests that aspect may join tense as a useful clinical marker of SLI. This seems especially true for grammatical aspect and, within lexical aspect, for both inherently and compositionally telic verbs. Special problems in these areas of grammar are seen across languages – languages that mark aspect in very different ways. In addition, lexical aspect might provide important clinical information through its influence on children's ability to mark tense. Collectively, the evidence points to greater problems when time-related notions fall on the more morphosyntactic end of the language continuum, with a reduction in severity when time-related notions, such as modals and temporal adverbs, have an identifiable pragmatic and/or semantic component.

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References

- Abdalla F, Crago M. Verb morphology deficits in Arabic-speaking children with specific language impairment. *Applied Psycholinguistics*. 2008; 29:315–340.
- Blom E. The acquisition of finiteness. Berlin: Walter de Gruyter; 2008.
- Blom E, Vasi N, de Jong J. Production and processing subject-verb agreement in monolingual Dutch children with specific language impairment. *Journal of Speech, Language, and Hearing Research*. 2014; 57:952–965.
- Bol G, de Jong J. Auxiliary verbs in Dutch SLI children. *Scandinavian Journal of Logopedics and Phoniatics*. 1992; 17:17–21.
- Bybee J. *Morphology: A study of the relation between meaning and form*. Amsterdam: John Benjamins; 1985.
- Comrie B. *Aspect*. Cambridge, UK: Cambridge University Press; 1976.

- Conti-Ramsden G, Botting N, Faragher B. Psycholinguistic markers for specific language impairment. *Journal of Child Psychology and Psychiatry*. 2001; 42:741–748. [PubMed: 11583246]
- de Jong J. Specific language impairment in Dutch: Inflectional morphology and argument structure. *Groningen Dissertations in Linguistics*. 1999; 28
- de Jong J, Blom E, Orgassa A. Dummy auxiliaries in children with SLI – A study on Dutch in monolinguals and bilinguals. In: Blom E, van der Craats I, Verhagen O, editors *Dummy auxiliaries in first and second language acquisition*. Berlin: Walter de Gruyter; 2013. 251–278.
- Fletcher P, Leonard L, Stokes S, Wong AM-Y. The expression of aspect in Cantonese-speaking children with specific language impairment. *Journal of Speech, Language, and Hearing Research*. 2005; 48:621–634.
- Hansson K, Nettelbladt U, Leonard L. Specific language impairment in Swedish: The status of verb morphology and word order. *Journal of Speech, Language, and Hearing Research*. 2000; 43:848–864.
- Hoover J, Storkel H, Rice M. The interface between neighborhood density and optional infinitives: Normal development and specific language impairment. *Journal of Child Language*. 2012; 39:835–862. [PubMed: 22123500]
- Hoekstra T, Hyams N. Aspects of root infinitives. *Lingua*. 1998; 106:81–112.
- Ingram D, Morehead D. Morehead & Ingram revisited. *Journal of Speech, Language, and Hearing Research*. 2002; 45:559–563.
- Ingram D, Thompson W. Early syntactic acquisition in German: Evidence for the modal hypothesis. *Language*. 1996; 72:97–120.
- Kelly D, Rice M. Preferences for verb interpretation in children with specific language impairment. *Journal of Speech and Hearing Research*. 1994; 37:182–192. [PubMed: 8170123]
- Krantz L, Leonard L. The effect of temporal adverbials on past tense production by children with specific language impairment. *Journal of Speech, Language, and Hearing Research*. 2007; 50:137–148.
- Kunnari S, Savinainen-Makkonen T, Leonard L, Mäkinen L, Tolonen A-K, Luotonen M, Leinonen E. Children with specific language impairment in Finnish: The use of tense and agreement inflections. *Journal of Child Language*. 2011; 38:999–1027. [PubMed: 21281548]
- Leonard L, Bortolini U, Caselli MC, McGregor K, Sabbadini L. Morphological deficits in children with specific language impairment: The status of features in the underlying grammar. *Language Acquisition*. 1992; 2:151–179.
- Leonard L, Deevy P. Tense and aspect in sentence interpretation by children with specific language impairment. *Journal of Child Language*. 2010; 37:395–418. [PubMed: 19698206]
- Leonard L, Deevy P, Kurtz R, Krantz Choev L, Owen A, Polite E, Elam D, Finneran D. Lexical aspect and the use of verb morphology by children with specific language impairment. *Journal of Speech, Language, and Hearing Research*. 2007; 50:759–777.
- Leonard L, Deevy P, Miller C, Charest M, Kurtz R, Rauf L. The use of grammatical morphemes reflecting aspect and modality by children with specific language impairment. *Journal of Child Language*. 2003; 30:769–795. [PubMed: 14686084]
- Leonard L, Deevy P, Wong AM-Y, Stokes S, Fletcher P. Modal verbs with and without tense: A study of English- and Cantonese-speaking children with specific language impairment. *International Journal of Language and Communication Disorders*. 2007; 42:209–228. [PubMed: 17365094]
- Leonard L, Hansson K, Nettelbladt U, Deevy P. Specific language impairment in children: A comparison of English and Swedish. *Language Acquisition*. 2004; 12:219–246. [PubMed: 25995609]
- Leonard L, Lukács Á, Kas B. Tense and aspect in childhood language impairment: Contributions from Hungarian. *Applied Psycholinguistics*. 2012; 33:305–328.
- Linguistic Society of Hong Kong. The LSHK Cantonese Romanization scheme. Hong Kong: 1994.
- Lukács Á, Leonard L, Kas B, Pléh C. The use of tense and agreement by Hungarian-speaking children with language impairment. *Journal of Speech, Language, and Hearing Research*. 2009; 52:98–117.
- Moore M, Johnston J. Expressions of past time by normal and language-impaired children. *Applied Psycholinguistics*. 1993; 14:515–534.

- Oetting J, Horohov J. Past tense marking by children with and without specific language impairment. *Journal of Speech, Language, and Hearing Research*. 1997; 40:62–74.
- Ott S, Höhle B. Verb inflection in German-learning children with typical and atypical language acquisition: The impact of subsyllabic frequencies. *Journal of Child Language*. 2013; 40:169–192. [PubMed: 23217295]
- Owen A. Proficiency with tense and aspect concordance: children with SLI and their typically developing peers. *Journal of Child Language*. 2011; 38:675–699. [PubMed: 21050500]
- Paradis J, Crago M. Tense and temporality: Similarities and differences between language-impaired and second-language children. *Journal of Speech, Language, and Hearing Research*. 2000; 43:834–848.
- Paradis J, Crago M. The morphosyntax of specific language impairment in French: An extended optional infinitive account. *Language Acquisition*. 2001; 9:269–300.
- Penner Z, Schulz P, Wymann K. Learning the meaning of verbs: What distinguishes language-impaired children from normally developing children? *Linguistics*. 2003; 41:289–319.
- Radford A. *Syntactic theory and the structure of English: A minimalist approach*. Cambridge, UK: Cambridge University Press; 1997.
- Rice M. A unified model of specific and general language delay: Grammatical tense as a clinical marker of unexpected variation. In: Levy Y, Schaeffer J, editors *Language competence across population: Toward a definition of SLI*. Mahwah, NJ: Lawrence Erlbaum Associates; 2003. 63–94.
- Rice M, Wexler K. Toward tense as a clinical marker of specific language impairment. *Journal of Speech and Hearing Research*. 1996; 39:1239–1257. [PubMed: 8959609]
- Rost G, Hoover J, Brennan M. Lexical aspect as a source of variability in - 3s marking: Typical development and SLI. Poster presented at the Symposium on Research in Child Language Disorders; Madison, WI. 2014.
- Schulz P, Witte A. Opening doors and sweeping floors: What children with specific language know about telic and atelic verbs. In: Beachley B, Brown A, Conlin F, editors *Proceedings of the 27th Annual Conference on Language Development*; Somerville, MA. Cascadia Press; 2003. 727–738.
- Schulz P, Wymann K, Penner Z. The early acquisition of verb meaning in German by normally developing and language impaired children. *Brain and Language*. 2001; 77:407–418. [PubMed: 11386706]
- Shirai Y, Andersen R. The acquisition of tense-aspect morphology: A prototype account. *Language*. 1995; 71:743–762.
- Smith C. *The parameter of aspect*. Dordrecht, The Netherlands: Kluwer; 1997.
- Stokes S, Fletcher P. Lexical diversity and productivity in Cantonese-speaking children with specific language impairment. *International Journal of Language and Communication Disorders*. 2000; 35:527–541. [PubMed: 11091822]
- Stokes S, Fletcher P. Aspectual forms in Cantonese children with specific language impairment. *Linguistics*. 2003; 41:381–406.
- Vang Christensen R, Hansson K. The use and productivity of past tense morphology in specific language impairment: An examination of Danish. *Journal of Speech, Language, and Hearing Research*. 2012; 55:1671–1689.

Table 1

The Imperfective and Perfective Forms for Third Person for the Arabic Verb Root k-t-b ‘Write’

Number	Gender	Imperfective	Perfective
Singular	Masculine	<i>yiktub</i>	<i>katab</i>
	Feminine	<i>tiktub</i>	<i>katabat</i>
Plural ^a		<i>yiktubu</i>	<i>katabu</i>

^a Arabic does not make a gender distinction in plural.