Verbs and Syntactic Frames in Children's Elicited Actions: A Comparison of Tamil- and English-Speaking Children

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Abstract   We directly compare children learning argument expressing and argument dropping languages on the use of verb meaning and syntactic cues, by examining enactments of transitive and intransitive verbs given in transitive and intransitive syntactic frames. Our results show similarities in the children's knowledge: (1) Children were somewhat less likely to perform an action when the core meaning of a verb was in conflict with the frame in which it was presented; (2) Children enacted the core meaning of the verb with considerable accuracy in all conditions; and (3) Children altered their actions to include or not include explicit objects appropriately to the frame. The results suggest that 3-year-olds learning languages that present them with very different structural cues still show similar knowledge about and sensitivity to the core meanings of transitive and intransitive verbs as well as the implications of the frames in which they appear.

Keywords   Verbs · Syntactic frames · Argument structure · Argument dropping · Tamil

The meanings of common verbs such as *kick* can be understood in terms of two related aspects of their meaning, (1) the "core" or "root" meaning (Pinker 1994; see also Goldberg 1995), and (2) the abstract relational structure as indicated by the arguments with which the verb is used. For example, *kick* can be understood as having a core meaning involving a forceful forward leg movement and a relational meaning that depends on the particular argument structure with which it is used (e.g., *He kicked the ball*, a direct transitive action upon an object; *The horse kicked*, an intransitive action involving a kind of leg movement; etc.)

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The core meaning of common verbs has been less systematically studied than the relational or syntactic structures of these same verbs (Gleitman 1994; Gleitman et al. 2005). Recently, however, there has been increasing interest in the action categories labeled by common verbs—how the action events referred to by *walking* differ from *running* (Malt et al. 2008) or how *kick* differs from *throw* (James and Maouene 2009; Maouene et al. 2008). These psycholinguistic and cognitive neuroscience studies indicate that young children as well as adults have well-developed knowledge about the spatiotemporal dynamics of the actions within verb categories (Malt et al. 2008; Woodward and Needham 2009), the body-parts involved in those actions (James and Maouene 2009; Maouene et al. 2008; Pulvermueller 2005), the event structures that characterize particular verb categories (Majid et al. 2008), and the characteristic objects involved in the actions labeled by common verbs (Maouene et al. in press; Maouene and Smith in preparation; Reznik 1996). In brief, although this is not yet a large literature, the evidence that exists suggests that young children are learning the core meaning of verbs.

There has been much more attention to what children know about the abstract relational meaning of verbs, as indicated by the syntactic frames in which the verbs are used (Gleitman 1994; Gleitman et al. 2005). There are systematic regularities between verbs and syntactic frames throughout adult language (Fisher et al. 1991; Levin 1993; Merlo and Stevenson 2001) and also in child-directed speech (Lederer et al. 1995; Naigles and Hoff-Ginsberg 1995, 1998). Moreover, children learning English are highly sensitive to these frames and the meaning implications of those frames; indeed, they can use the frames to determine the potential meaning of a novel verb (e.g., Gillette et al. 1999; Gleitman 1994; Gleitman et al. 2005; Landau and Gleitman 1985; Naigles and Hoff-Ginsberg 1995, 1998).

Recent cross-linguistic analyses raise the question of whether these two components of meaning might matter differently in different languages and, in particular, whether the arguments used with a verb are more important for learners of English, a language which explicitly expresses a verb's arguments, than for learners of languages which often drop verbal arguments (Göksun et al. 2008; Sethuraman and Smith 2010, Submitted; see also Bowerman and Brown 2008). English nearly always pairs transitive verbs with overtly expressed objects whereas many other languages frequently do not, especially in everyday speech and speech to children (Allen 2007; Brown 2007; Clancy 2004; Göksun et al. 2008; Küntay and Slobin 2002; Lee and Naigles 2005, 2008; Naigles et al. 2006; Narasimhan et al. 2005; Rispoli 1995; Skarabela 2007; Skarabela and Allen 2002; Wilkins 2008) and thus verb acquisition in English might differ in important ways from verb acquisition in other languages. Prior cross-linguistic research suggests that children learning languages with highly variable and/or minimal pairings of verbs and overtly expressed arguments *are* sensitive to the meaning implications of argument structure (e.g., Göksun et al. 2008; Küntay and Slobin 2002; Lee and Naigles 2005, 2008; Lidz et al. 2003; Naigles et al. 2006); however, there are also hints that they might weight syntactic information less than other sources of information (Göksun et al. 2008; Sethuraman and Smith 2010, Submitted).

The central question for the present study, which provides a direct comparison of children learning argument-expressing and argument-dropping languages, is how young children weight these two components of verb meaning, namely the core meaning of the verb and the abstract relational meaning of the verb. A recent study of children learning Turkish, a language with considerable ellipsis and morphology, found that Turkish learners are influenced by the verb meaning, either significantly following the verb meaning by enacting transitive verbs primarily causatively and intransitive verbs primarily non-causatively regardless of the type of frame in which the verb was presented, or equally relying upon verb meaning and

frame meaning (Göksun et al. 2008); by comparison, English-speaking children rely far more strongly on the frame than the verb in their enactments (Naigles et al. 1993).

The two languages examined in the current study are English and Tamil. English is an SVO word order language, with very little nominal or verbal morphology, and tends to overtly express argument structure in the use of verbs. Tamil is a Dravidian language spoken primarily in south India and allows regular 'argument omission'. Tamil is an SOV word order language, with comparably richer nominal and verbal morphology systems (Schiffman 1999). Although the subject is marked on the verb, other verbal arguments are frequently left unexpressed. Overall, uses of verbs in Tamil are generally associated less systematically with any given overtly expressed argument structure. For example, *give* in English requires that all three roles implied (a giver, a receiver, and a given thing) must be explicitly expressed in the use of *give*; however, in Tamil, it is acceptable to use the common verb and dictionary translation of *give* (*kuDu*) in additional ways, including *He gives him*, *He gives*, and *He gives it.* Two recent studies document these differences in overt mention of arguments by adult and child speakers of Tamil and English (Sethuraman and Smith 2010) and suggest that there are significant differences in how English- and Tamil-learning children attend to cues from argument structure in interpreting verb meaning (Sethuraman and Smith Submitted). In the current study, we directly examine whether children learning English and Tamil pay more attention to the verb meaning or to the syntactic frame.

Following the method used by Naigles et al. (1993) and Göksun et al. (2008), children in the current study were presented with known transitive and intransitive verbs in congruent and incongruent syntactic frames and asked to act out the action, to determine whether children would be more influenced by the frame meaning or the core verb meaning in their enactments. For example, if children are asked to show *pushing it* or *pushing*, do they use an appropriate forward hand motion, the appropriate core meaning, and do they actually push something? Likewise, if they are asked to show *smiling* or *smiling it* do they show the appropriate facial gesture and do they smile at some specific object? The study also provides a direct comparison of children learning argument-expressing and argument-dropping languages in this task. In this way, we measure the relative attention of children learning two very different languages to the core meaning of the verb and to the syntactic cues provided by the arguments of the verb.

Method

Participants

Twenty English-speaking children participated in the Intransitive Frame condition (n = 10, mean age 3;5, range 3;2–4;0) or Transitive Frame condition (n = 10, mean age 3;7, range 3;4–3;11); 20 Tamil speaking children participated in the Intransitive Frame condition (n = 10; mean age 3;6, range 2;11–4;0) or Transitive Frame condition (n = 10; mean age 3;0, range 2;11–4;0). The English-speaking children were recruited from the residents of a small midwestern college town, and the sample includes children of parents from a range of professions, including academics as well as farmers and other workers in rural areas with no college education, and encompasses a wide range of ethnicities. The Tamil-speaking children were selected to be as directly comparable as possible and included children whose parents were doctors and high school teachers, as well as children whose parents had no college education.

The English-speaking children were all monolingual, but the Tamil-speaking children may not have been strictly monolingual. Because India is a multilingual country, many speakers

of Tamil also speak one or more additional languages, and children are exposed to many languages. English, in particular, is pervasively used in everyday speech, although many children enter school without producing full English sentences. In order to have a population of children whose main language is Tamil, children of parents whose mother tongue is Tamil, who spoke Tamil at home, and who were educated primarily in Tamil-medium schools were selected.

The English learners were tested individually in a developmental psychology laboratory with one or both parents present. The Tamil learners were recruited in Chennai, Tamil Nadu, India from two Tamil-medium preschools. Children were tested individually in a separate room at the preschool with a teacher present.

Stimuli

A total of sixteen verbs were used in each language. Because we are interested in the children's overall performance for core verb meaning and abstract relational meaning, and not differences regarding specific verbs, our main criterion for verb selection was that all the verbs be ones that are demonstrably known to be early-learned by English- and Tamil-speaking children, even if that meant we had sets of verbs that were not direct translational equivalents of each other. For English, we selected verbs from the MacArthur-Bates Communicative Development Inventory, which provides normative data on what verbs are known by very young children (Fenson et al. 1994). There is no comparable normed CDI in Tamil, so verbs in Tamil were chosen from those used in child speech in a small Tamil corpus on CHILDES (MacWhinney 2000; Narasimhan 1981), or were produced by Tamil-learning children in other studies (Sethuraman and Smith 2010, Submitted.) Thus, because we focused on choosing verbs known to be early-learned by the two groups of children, the verbs used in each language were different. Although this is developmentally and culturally fair (to use verbs well-known by the children in the two languages), it raises possible limitations with respect to linguistic and semantic comparability. However, finding translational equivalents was not always possible and is rarely uncontroversial. For example, the translational equivalent of a common and early concept may not be a verb in both languages (e.g., the translation of the English verb *yawn* in Tamil is "let go a yawn") or the same verb in one language may be two different verbs in the other (e.g., two very common and early-learned verbs in Tamil are both translated as "put" in English). Accordingly, for the purposes of this experiment we chose to use transitive and intransitive verbs that were developmentally appropriate in each language.

Four of the sixteen verbs used in each language were used for pre-test and demonstrating the task: Transitive—English: *drink, hit*; Tamil: *kuDi* 'drink', *aDi* 'hit' and Intransitive—English: English: *sleep, cry*; Tamil: *tuungu* 'sleep', *aRu* 'cry'. For the experimental test, four Intransitive verbs were used from each language: English—*blink, cough, laugh, yawn*; Tamil—*irimbu* 'cough', *siri* 'smile/laugh', *tumbu* 'sneeze', *tirumbu* 'turn (oneself)' and eight Transitive verbs were used from each language: English—*want, get, have, do, cut, fix, push, tie*; Tamil—*kudu* 'give', *vai* 'put, place', *pooDu* 'put, drop', *eDu* 'take', *narakku* 'cut', *taLLu* 'push', *kaTTu* 'tie', *tuukku* 'lift'.

A set of five objects to be used in potential actions of these verbs were selected to be ambiguous, to offer a range of possible actions, and to not be specifically associated with any of the tested verbs. The five objects used were a piece of string, a sponge, the top of a spatula, a plastic ring, and a block.

Procedure

Children were given a small box containing five ambiguous objects and were asked to remove the items from the box and help the experimenter line up four of the objects in front of the child according to one of six random presentation orders. The experimenter kept the block in front of her.

Pretest Trials

The experimental session began with a pretest in which four verbs, two transitive (English: *drink, hit*; Tamil: *kuDi* 'drink', *aDi* 'hit') and two intransitive (English: *sleep, cry*; Tamil: *tuungu* 'sleep', *aRu* 'cry'), were demonstrated to the child. In the Intransitive Frame condition, the experimenter said, "*Look! Hitting!*" (Tamil: *paaru! aDikkardu*!, 'look! hitting!'); in the Transitive Frame condition, the experimenter said, "*Look! Hitting it!*" (Tamil: *paaru! ada aDikkardu*! 'look! it-*accusative* hitting!') In both cases, the experimenter demonstrated the intransitive verbs without using an object but demonstrated the transitive verbs using the block. The experimenter then asked the child to repeat the action: Intransitive Frame condition: "*Now you show me hitting/sleeping!*" (Tamil: ippo nii aDikkardu kaami, 'now you hitting show') or Transitive Frame condition: "*Now you show me hitting it/sleeping it!*" (Tamil: ippo nii ada aDikkardu kaami, 'now you it-*accusative* hitting show'). If the child did not use an object in his or her demonstration of a transitive verb during the pretest, the experimenter prompted the child to use an object by pointing to the objects and saying, Intransitive Frame condition: "*Show me hitting using one of these*" (Tamil: *ida veccindu aDikkardu kaami*, 'this-*accusative* using hitting show') or Transitive Frame condition: "*Show me hitting it using one of these*" (Tamil: *ida veccindu ada aDikkardu kaami*, 'this-*accusative* using it-*accusative* hitting show').

Test Trials

For the test trials, the child was asked to demonstrate the twelve test verbs, presented in one of two random orders. The verbs were presented in three sets, of five, five, and six verbs, with demonstrations of two pretest verbs given in between each set to keep the child focused on the task. That is, the child was asked to act out the first set of five test verbs, one at a time; these were followed by the experimenter demonstrating two of the pretest verbs (one transitive, with an object, one intransitive, without an object) with the child asked to repeat these actions and prompted to use an object for the transitive verb if the child did not use an object in his or her first demonstration. The child was then asked to act out the second set of five test verbs, one at a time; the experimenter once more demonstrated two of the pretest verbs, as described above. Then the child was given the final set of verbs and was asked to act out the last six test verbs, one at a time. Children's enactments were videotaped and coded later.

Coding

Three independent coders watched the videotapes and coded the actions. Trials that consisted of "no responses" (e.g., child did not act out the verb or said "I don't know") were discounted from further coding.

The remainder of the enactments was coded in two ways: First, the coders examined the actions for whether the enactments matched the verb meaning (e.g., *pushing* was

demonstrated with a pushing motion) or did not match the verb meaning (e.g., *pushing* was demonstrated by putting one object on top of another.) Second, the coders examined the actions for whether they were transitive or intransitive enactments; that is, the actions were coded for whether the enactment matched the syntactic frame (e.g., *cutting it* was demonstrated by pretending to cut the string with the child's hand or with the spatula top) or did not match the syntactic frame (e.g., *cutting it* was demonstrated by a cutting motion in the air involving only the child's hand and no object). The three coders all coded a sample of 10% of the data and agreement between coders was 98% for both types of coding, with disagreements resolved through discussion.

Results

Of the 240 test trials across children within a language group, the Tamil-speaking children did not respond on 43 trials (17.9%) and the English-speaking children did not respond on 36 trials (15%); these are not reliable differences, chi-square (1) <1.50. There were more no responses in the Verb-Frame Incongruent condition (49) than Verb-Frame Congruent condition (30); although this difference was not reliable, chi-square (1) < 1.00. Overall the number of no responses was small and for the remaining analyses, the data are analyzed in terms of the proportion of trials on which children performed an action.

Core meaning of the Verbs

Children speaking both languages typically enacted the verbs with actions correctly representing the core meaning of the verb in both conditions. Figure 1 shows the proportion of responses that matched and did not match the core meaning in the Intransitive Frame condition (Intransitive verbs—English: .92; Tamil: .83; and Transitive verbs—English: .76; Tamil: .76), and in the Transitive Frame condition (Intransitive verbs—English: .73; Tamil: .80; and Transitive verbs—English: .81; Tamil: .82).
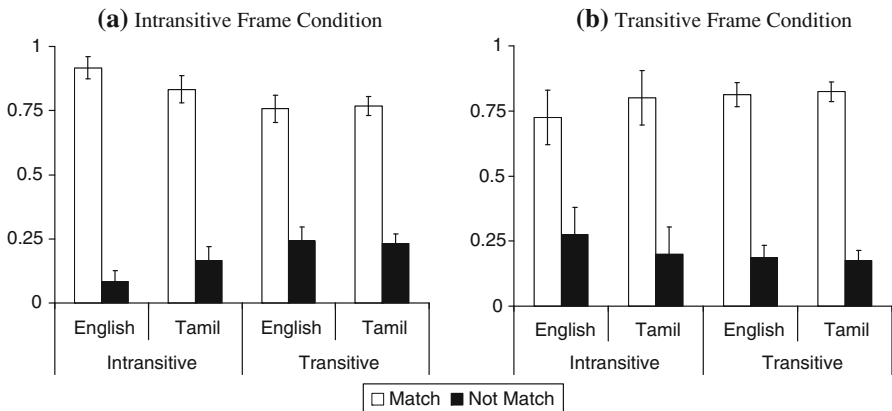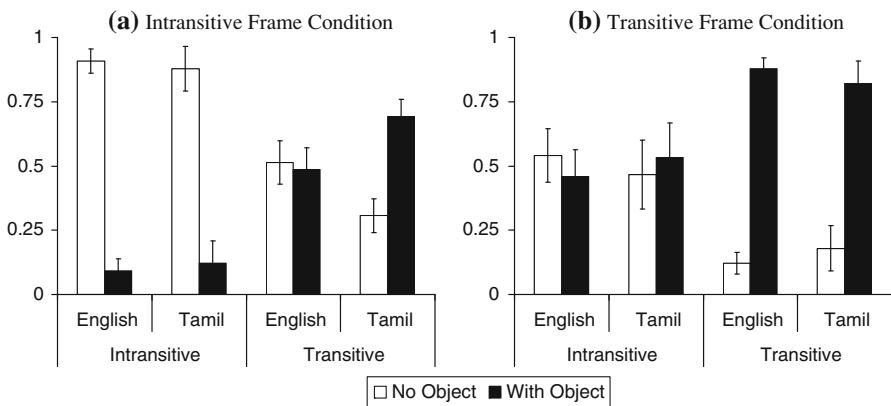

Fig. 1 Proportion of matches and no matches for the core meaning of the target verbs produced by English-Speaking and Tamil-Speaking Children for Intransitive and Transitive Verbs in **a** the Intransitive Frame Condition and **b** the Transitive Frame Condition

A Language (2) x Condition (2) x Verb Type (2) ANOVA on responses matching the core meaning yielded non-significant results for Language, $F(1, 35) = 0.000$, $p = .985$, Condition, $F(1, 35) = 0.013$, $p = .610$, Verb Type, $F(1, 35) = 0.500$, $p = .484$, Verb Type x Language, $F(1, 35) = 0.014$, $p = .908$, Verb Type x Condition, $F(1, 35) = 3.922$, $p = .056$, and Verb Type x Language x Condition, $F(1, 35) = .715$, $p = .404$. In brief, we see no language differences here: children speaking both languages clearly understand the core meaning of both verb types, regardless of whether they are presented in transitive or intransitive frames, to equivalent extents.

Relational Meaning of the Verbs

Figure 2 shows the proportion of enactments that matched the frame in which the verb was presented in the two conditions. In the Intransitive Frame condition, when no pronoun was mentioned, English-speaking children rarely used an object (.09) to demonstrate an Intransitive verb; in contrast, they enacted Transitive verbs sometimes with (.49) and sometimes without an object (.51). In the Intransitive frame condition, Tamil-speaking children also rarely enacted Intransitive verbs with an object (.12) and but enacted Transitive verbs most often with an object (.67). Children speaking both languages were clearly influenced by the presence of "*it*" after the verb in the Transitive Frame condition. When the verb was presented with a pronoun, both groups enacted Transitive verbs most often with an object (English: .88 / Tamil: .82). Additionally, both groups used an object in their enactments of Intransitive verbs to a greater extent than they did in the Intransitive Frame condition (English: .46 / Tamil: .53).

The proportions of responses with an object were submitted to a repeated measures ANOVA with Language (2) X Condition (2) X Verb Type (2). The analysis yielded main effects for Condition, $F(1, 35) = 22.393$, $p < .001$, and Verb Type, $F(1, 35) = 60.949$, $p < .001$, showing that children act out transitive and intransitive verbs differently, and that they are influenced by the Transitive and Intransitive frames. However, there was no main effect for Language, $F(1, 35) = .699$, $p = .409$ and no reliable interactions: Verb Type x Language, $F(1, 35) = .014$, $p = .905$, Verb Type x Condition, $F(1, 35) = 1.299$, $p = .262$, Language x Condition, $F(1, 35) = .513$, $p = .478$, and the three-way interaction of Verb

Fig. 2 Proportion of no object and with object responses produced by English-Speaking and Tamil-Speaking Children for Intransitive and Transitive Verbs in **a** the Intransitive Frame Condition and **b** the Transitive Frame Condition

Type x Language x Condition, F(1, 35) = 1.895, p = .177. Although there are hints of small differences between the two groups of children here and there, those differences are small and unreliable. Despite learning very different languages with different properties with respect to the explicit mention of a verb's arguments, children in both languages appear to attend to the frame in which a verb is presented.

One notable aspect of the results concerning children's understanding of the relational meaning of the verbs, is the significant effects for Verb Type and for Condition, suggesting that in both languages, the distinction between intransitive and transitive verbs is meaningful to the children, and that whether a verb is used in a Transitive or an Intransitive frame is highly informative to children learning both languages. The lack of a main effect of Language or interaction involving Language suggests that the core verb meaning and the syntactic cues are similarly understood by the two groups of children. We examine in the discussion what these results mean in light of the significant differences in the structures of the languages the English- and Tamil-learning children speak.

Discussion

The present results show that young learners of two very different languages are clearly learning about both the core meanings of verbs and the implications of argument structure. This is shown by three aspects of the present results: (1) Although children usually performed actions, they were somewhat less likely to perform any action at all when the core meaning of a verb was in conflict with the frame in which it was presented; (2) Children enacted the core meaning of the verb with considerable accuracy in all conditions; and (3) Children altered their actions—to include or not include explicit objects—appropriately to the frame. The results provide no compelling evidence for differences between children learning the two languages with respect to their sensitivity to core meanings and to the particular frame.

This last result may seem surprising. English is a language which virtually always expresses its arguments. Indeed the use of "*it*" following transitive verbs is so common in English in adult- and child-directed speech (Chafe 1994; Dodson and Tomasello 1998; Lieven et al. 1997; Valian 1991) and young children learning English are so attentive to this cue to meaning (see Laakso and Smith 2007), that some have suggested that "*it*" serves as an early marker of transitivity (Childers and Tomasello 2001; Jones et al. 2000; Lieven et al. 1997; Mintz 2003). Tamil, in contrast, is a language that commonly drops arguments, and particularly the objects of verbs (Sethuraman and Smith 2010). Thus young Tamil learners often hear transitive verbs in the same frames as they hear intransitive verbs; at the very least, the experience of the frames discriminating transitive and intransitive meanings is much noisier in Tamil than in English. Nonetheless, young learners—3-year-olds—in both languages show similar knowledge about and sensitivity to both the core meanings of transitive and intransitive verbs as well as the implications of the frames in which they appear. This main result suggests that these two kinds of cues—core verb meaning and the syntactic frame used with the verb—are important for both argument expressing and argument dropping languages, and children learning both types of languages are sensitive to these from early on.

The lack of differences between the English- and Tamil-speaking children in our task may be due to the fact that the Tamil learners may not be strictly monolingual and may know some English. However, these results are supported by evidence from other studies of verb learning in argument dropping languages, which suggest that children pay attention to syntactic frames and the range of frames used with a verb, despite the fact that these syntactic cues are used inconsistently and often omitted (e.g., Lee and Naigles 2005, 2008; Lidz et al. 2003;

Göksun et al. 2008; Küntay and Slobin 2002; Naigles et al. 2006). It may be that hearing syntactic cues used even some of the time, either in Tamil input or from occasional English input, is enough for young learners to know they are important and to pay attention to them.

One question of interest is whether the overall pattern observed here holds for all verbs. Snedeker and Gleitman (2004) showed with English-speaking adults that light verbs in English are misinterpreted without syntactic information to a greater extent than more specific verbs. Similarly, in their study of an argument dropping language, Göksun et al. (2008) found that Turkish-speaking children were more sensitive to syntactic information in their enactments of light verbs than more specific verbs, suggesting that these more general verbs may require additional syntactic information for interpretation even in an argument dropping language; however, these verbs are also marked with a causative morpheme, unlike the Tamil verbs, which may have influenced this result. Comparisons within and across languages of the weighting of core meanings and the argument structures for different verbs will be important in future work for understanding the role of core meanings, argument structure and interactions.

The results of the current study raise one of the most profound issues in language learning. Considerable evidence indicates that the statistical regularities within a language (Childers and Tomasello 2001; Jones et al. 2000; Laakso and Smith 2007; Lieven et al. 1997; Mintz 2003) and within an individual learner's experiences (Bowerman and Brown 2008; Göksun et al. 2008; Naigles et al. 2006; Sethuraman and Smith 2010, Submitted) matter. Yet language is also about discerning and exploiting the deeper regularities in the data. Despite the differing patterns of language use, apparently both Tamil and English present sufficient regularities for young learners to acquire core meanings of verbs and the relational implications of argument structures. This conclusion does not mean that these two meanings are acquired in the same way. English and Tamil present different regularities and thus different learning problems.

The potential importance of the lack of a difference in sensitivity to the frame in the present study can be viewed in terms of the results from two previous studies that indicate significant differences in how English- and Tamil-learning children learn and use verbs and argument structure. In one study (Sethuraman and Smith 2010), adult and child English and Tamil speakers were asked to describe short video clips of everyday actions. English speakers, both adult and child, showed a greater sensitivity to the number of elements in the relational scene and were more affected by the pragmatic manipulations—scenes with differing numbers of items present—than adult and child speakers of Tamil, a language which allows more choice in the arguments that are expressed. English speakers may have been more affected by these pragmatic manipulations because changing the number of items in a scene may be thought of as altering the relational structure to some degree. The effects from increasing the number of objects in the scene suggests fundamental differences related to language structure in what speakers of different languages choose to mention when describing a relational scene. The habitual explicit mention of arguments by English speakers may make them more sensitive to variations in the objects in relational scenes than Tamil speakers, who typically explicitly mention fewer arguments. But sensitivity to variations in the relational structure of scenes is different from sensitivity to the relational structure of language, and the present results suggest that despite these differences in how speakers of the two languages talk about scenes, young learners in both languages are highly attentive to linguistic arguments.

In a second study (Sethuraman and Smith Submitted), children speaking English and Tamil were asked to choose the best depictions of a bare verb, presented without any arguments, from static pictures that presented the full relational structure of the target verb or only components of that relational structure. English-speaking children overwhelmingly selected the picture depicting the full relational structure of the target verbs, but older Tamil-speaking

children were much less likely to do so. English-speaking children's greater preference for the full relational structure picture is consistent with the idea that verbs in English, because of their history of association with explicitly expressed arguments, more strongly point to the relational structure than verbs in Tamil, which are not so consistently associated with explicitly expressed arguments. Again, this result highlights the importance of the differences found in the present results: Tamil-speaking children may be open to a wider range of relational structures being referentially possible for a verb, but when they hear an expressed argument, they know what it implies. Consistent with this conclusion, one experiment in that prior series of studies tested Tamil-speaking children not with bare verbs but with verbs with overtly expressed arguments. Given expressed arguments, the Tamil learners overwhelmingly selected the full relational structure picture, again indicating that they attend to and fully understand expressed arguments. The fact that Tamil-speaking as well as English-speaking children perform differently (in both frame conditions) with transitive and intransitive verbs also suggest that learners in both languages—despite the differences in the overt expression of the object of the verb—are learning the inherent differences in the relational meanings of transitive and intransitive verbs.

In conclusion, the findings that both English- and Tamil-speaking children interpret core verb meanings and syntactic cues to similar extents support the idea of universal mappings between arguments, relational roles, and verb meanings (e.g., Gleitman 1994; Gleitman et al. 2005; Lidz et al. 2003). By the universalist account, there is an inextricable tie between a verb's core meaning and its abstract relational structure. Argument structures directly correlate with components of the meanings of the verbs they are used with and are, to a large extent, derivable from the meanings of those verbs (e.g., Landau and Gleitman 1985; Levin 1993; Pinker 1994). By this view, verbs in languages that allow arguments to be dropped are argued to still be regularly associated with those missing elements. Although the regularities available may be more variable than and not as transparent as those in English, nevertheless, speakers of these languages are argued to still be able to use probabilistic surface cues in learning grammatical generalizations (Gleitman 1994; Gleitman et al. 2005; Lidz et al. 2003). Clearly the case is not settled without the systematic examination of more verbs, more languages, and relational roles beyond the transitive and intransitive (see Göksun et al. 2008; Küntay and Slobin 2002; Naigles et al. 2006).

Even within this universalist account, however, it is important to remember that the learning task may be fundamentally different for Tamil-speaking than English-speaking children. Tamil-speaking children have a different problem than do English-speaking children because they are hearing adults use verbs in very different linguistic contexts, which may focus attention on different aspects of the scene. Just how children learn verbs in these very different languages with differences in the variability of the links among verbs, expressed arguments, and the relational structure of the referred-to scene—whether core meanings serve as bootstrap to argument structure or vice version and whether the answer depends on the language being learned—is a question for future research. A common developmental outcome might emerge from somewhat different developmental paths.

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