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Interim Solutions: The Acquisition of Early Verb Constructions in Hindi[1]

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Interim Solutions: The Acquisition of Early Verb Constructions in Hindi

Over the last few years, several researchers have drawn upon a construction framework to examine early child language (see Clark, 2003; Tomasello, 2003 for review). Within such a framework, language is viewed in terms of recurrent patterns of meaning, rather than in terms of discrete and additive meaning units such as words. Within a construction approach, units such as "words" and "syntax" are not viewed as distinct categories but rather are viewed as placed along a continuum, all meaningful in roughly the same way. As Tomasello argues, "constructions are nothing more and nothing less than patterns of usage" (Tomasello, 2003, p.100).

The construction framework fits nicely with the view of several functionally oriented developmental psycholinguists who have argued that children draw upon domain general learning mechanisms to build up linguistic systems (see Budwig, 1995; Clark, 2003; Slobin, 1985; Tomasello, 2003 for reviews). One kind of domain general mechanism identified as central to language learning is the child's ability to find patterns in linguistic input (see Slobin, 1985; Tomasello, 2003). Children's emerging prelinguistic abilities to relate categories of similar objects and events into larger schemas, along with their

ability to carry out distributional analyses on behavioral sequences, provide a start in accounting for children's developing language. In learning particular constructions, children have been noted to pull out recurrent distributional patterns in input and through processes of analogy to build up units of meaning that are larger than individual words. While several researchers agree that constructions are useful constructs for studying early child language, little is known about their possible roles in the processes of development during the second and third years of life.

Some of the most extensive work carried out to date on constructions has examined children's ability to learn transitive and intransitive constructions (see Tomasello, 2003 for review). The central findings from such work have led to the conclusion that between the ages of 2 and 3 years, children make only quite limited generalizations. The children's earliest transitive and intransitive constructions appear to be restricted to item-based schemas that are primarily lexically specific and draw heavily on dominant patterns in adult speech to children (see Lieven, Pine, & Baldwin, 1997; Pine, Lieven, & Rowland, 1998; Tomasello, 1992).

A review of existing literature on children's earliest uses of transitive and intransitive constructions shows that much of

the work to date from a construction approach has been done with children acquiring English. Tomasello (1992), in a diary study of his daughter Travis' speech, found that the most reliable predictor of what the child between the age of 2 and 3 would do with a particular verb had to do with how the child heard that verb used in the speech of her caregiver. Some verbs were used in transitive constructions and others in intransitive constructions, but according to Tomasello, there was little evidence that the child, before age 3, was working with verb-general constructions. Other larger samples making use of observational methods and maternal diaries have found similar results before the age of 3 (see Lieven et al, 1997; Pine et al., 1998).

The findings from the small amount of experimental work available support the idea that before the age of 3, children are working in a verb-specific manner more than with larger constructional frames. The basic paradigm used has been to introduce children to novel verbs in a laboratory setting and to encourage them to use an alternative construction, thus "pulling" for the use of a particular construction in which the child has never heard the novel verb used. This is achieved by asking questions that encourage certain discourse perspectives. For instance, after training children with a novel verb in an

intransitive construction, children are encouraged to use the novel verb in a transitive frame when asked a question that places discourse focus on the agent. The basic finding across a series of such studies is that until well into the third year, children show limited productivity with something like a general transitive or intransitive frame and do not extend novel verbs in ways not modeled in the learning phase (see Tomasello, 2003 for review).

It is fair to say, though, that although functionally based theorists who have adopted a construction framework are in agreement that children draw upon domain general learning mechanisms, and that they start with rather limited and concrete meaning clusters, there is little agreement about the *process* by which children move from such limited scope productions to the abstract meanings more characteristic of children aged 4 and older. This chapter aims to contribute to a better understanding of the processes involved in children's arrival at adult-like systems by considering three issues. First, because most work to date on a construction grammar approach to early child language has examined children acquiring English, it seems important to examine crosslinguistically the issues involved in children's learning. To this end, our focus in this chapter will be on the acquisition of constructions in Hindi. Second, we will

suggest that children may make use of interim solutions en route to adult-like constructions. As we will describe in more detail below, interim solutions are viewed here as children's form-function linkages between a phase of limited scope, lexically specific patters and adult-like usage. Finally, we will illustrate a methodological procedure by which one can best test experimentally whether this is so. We turn first to briefly discuss why we selected Hindi as our focus and then turn to a consideration of the notion of interim solutions and its implications for a framework for studying children's ability to generalize in novel verb contexts.

In this chapter we draw upon our research on Hindi because Hindi offers important structural contrasts for the study of the acquisition of transitive and intransitive constructions. Hindi is an Indo-European language spoken primarily in Northern India. One reason it is an interesting language for examining acquisitional issues with constructions is that it is a language with rich argument ellipsis. This raises questions about how children make use of adult speech and whether their early use of child-directed speech is similar to the findings reported for children acquiring English.

Hindi is a particularly interesting language with regard to the acquisition of transitive and intransitive frames for two

reasons. First, in Hindi a change in syntactic verb-argument structure with the same verb typically requires changes in verb morphology. For instance, in English the transitive construction *The boy rolled the ball* and the intransitive *The ball rolled* have identical verb forms associated with transitive and intransitive (syntactic) argument structure respectively. In contrast, in Hindi the intransitive verb *luD|hak* 'roll' (*gend luD|hak-ii* 'ball-NOM roll--PFV.SG.F.') has to be affixed by the causative marker '*-aa*' if it is to be associated with transitive syntax (*laD|ke=ne gend=ko luD|hak-aa-yaa* 'boy-ERG ball-ACC roll-CAUS-PFV.SG.M.').[2] Hindi thus provides a set of options different from those offered in English and the study of such alternatives can widen our understanding of the process of learning argument constructions early on in the child's life. As we have noted elsewhere (see Narasimhan, 2005; Narasimhan, Budwig, & Marty, 2005; Srivastava, Budwig, & Narasimhan, 2005), children acquiring languages other than English that draw morphological distinctions between transitive and intransitive constructions might attend to such morphological distinctions, thereby making generalizations earlier than has been reported for English-speaking children. By adopting a crosslinguistic approach, this chapter aims to sharpen our understanding of language-specific and language-general aspects of children's

early abilities to generalize the meanings of transitive and intransitive constructions.

A second focus of the chapter concerns the notion of interim solutions. It has been noted above that prior work on novel verbs as well as some naturalistic work with English-speaking 2-year-olds has highlighted that children's early productions are item-based and that there is little evidence for a more abstract transitive or intransitive construction. Here it will be argued that as children move from item-based usage to adult like generalizations, children may draw upon limited meaning clusters as interim solutions. Interim solutions represent an intermediate phase between local item-based productions that are largely dependent on input they hear and a later phase of linking verbs to more abstract meaning units associated with transitive and intransitive frames. Some support for the idea that children could be working with interim solutions that are limited to uniquely childlike ways to pattern language for their own communicative needs (see Budwig, 1995; 2001; Budwig, Stein, & O'Brien, 2001; Clark, 2001). For instance, some children have been noted to reserve the use of the transitive frame to a scene involving first person agency acting to bring about change (see also Slobin, 1985 for discussion of such a restriction in English-speaking children and children learning

other languages) rather than all transitive constructions. Similarly, Budwig and colleagues (Budwig, 1995, 2001; Budwig et al., 2001) and Clark (2001) have argued that early use of intransitive constructions can be limited to interim solutions. For instance Budwig et al. (2001) have noted that the children reserve the use of patient subject intransitives to a specific meaning cluster involving resistance from the environment. For instance, having stated a desire to act in particular ways with a transitive construction ("I wanna attach the lego"), the child switches to a patient subject intransitive "It won't attach" to mark a specific communicative perspective – namely, one in which there is some form of goal-blocking or resistance from the environment. Only later are intransitive constructions with patient subjects used more generally as a marker of discourse foregrounding of the object of the verb in a variety of contexts (see Budwig et al. 2001).

If it is the case that children go through a phase of limited generalizations before their generalizations are as abstract as adult generalizations for using transitive and intransitive constructions, the possibility remains that the children are not generalizing in the experimental novel verb tasks because the generalizations presuppose an adult-like meaning system. Said differently, the attempts of researchers to

elicit transitive and intransitive constructions are based on what is known about the use of discourse focus for adult speakers of English. The possibility remains that if studies are designed with children's interim solutions in mind, then children may show their ability to go beyond item-based learning even if their ability generalize is more limited than that of adults. We therefore turn now to outline a three-step framework we have been using in our research to better design experiments to tap children's constructional abilities (see also, Smith & Budwig, 2005 for further illustration for English). The design we make use of is something we call "naturalistically informed novel verb training."

In the *naturally informed novel verb training procedure*, the first step of analysis is to start with a large cross-sectional corpus and systematically study how constructions of interest are used by children and their caregivers around the ages of 2 and 4. The next phase is to do small scale longitudinal case studies of at least one child and caregiver over a period of several months by looking at how constructions are used from the first verb use by the child until the end of the third year of life. The critical third step is then to design experiments based on what we learned from our first two steps and, in using findings from the cross-sectional and longitudinal naturalistic

studies, set up experiments using the novel verb training embedded within naturalistic observations so as to be able to collect more detailed information on how each child is performing.

We now illustrate how our work on Hindi has been enhanced by using this method that explicitly focuses on any potential for interim solutions. While we have yet to conduct the experiments with Hindi-speaking children, as our review of the cross-sectional and longitudinal data shows, such material provides the backdrop against which a solid understanding of construction use can inform the development of experimental trials (see Smith & Budwig, 2005 for illustration of this method for English). Children as young as 3 may well be able to generalize novel verbs to constructions but to date, the choice of constructions to study has been based on what is known about adult usage patterns rather than about children's interim solutions. We first briefly review our research on argument realization with emphasis on ellipsis, and then turn to how children use transitive and intransitive constructions for their own communicative needs when acquiring Hindi.

Argument Realization and the Acquisition of Hindi

To set the stage for a discussion of transitive and intransitive constructions in Hindi requires consideration of

argument realization. Researchers have suggested that children can use structural cues in the language they hear to acquire verb meaning (Gleitman, 1990), and that one very important clue is the number of arguments that co-occur with each verb, since this provides important information about the event type associated with that verb (Fisher, 1995). Hindi, though, is a language with pervasive argument ellipsis (Narasimhan, Budwig, & Marty, 2005), so one question is whether and how such ellipsis impacts children's verb development. Our earlier work examined this question in some detail. For present purposes we focus more narrowly on a review of two important questions: Do Hindi-speaking caregivers make use of argument ellipsis? If so, do children make transitivity errors, and is there any evidence that children randomly elide arguments?

To address these questions, we draw upon a cross-sectional sample from 12 children (five female and seven male) split equally between lower and upper class backgrounds. The children ranged in age from 2;10 to 4;3 with a mean age of 3;7 at the time of recording. All children were acquiring Hindi as a first language and lived in New Delhi. Each child was video and audio recorded for approximately one hour while interacting with their caregiver. These sessions included both free interaction and semi-structured play. At the onset of the visit the

children and caregivers engaged in whatever activity they desired. Often this included meal preparation, drawing, or writing activities. In addition, each dyad was given plastic blocks to play with for a 15-minute period, as well as a wordless story book to look at together. Some of the children had siblings who occasionally entered the room where the recording took place, and on occasion other adults made brief appearances, but the bulk of the time consisted of caregiver and child interaction.

Hindi-speaking Caregivers' Ellipsis Patterns

We noted above that Hindi is an important language to study because pervasive argument ellipsis might increase the difficulty of children assessing transitivity. One possibility is that children acquiring Hindi have no trouble identifying verb meanings because their caregivers might simply adopt a speech style that inserts arguments in discourse in ways that deviate from the common patterns of ellipsis characteristic of adult usage in Hindi. Since in Hindi omission is optional, caregivers might opt to realize the arguments of verbs explicitly to simplify the task of language acquisition.

The overall finding of our analysis of the 12 Hindi-speaking caregivers' speech to their children is that they did not distinguish transitive and intransitive verbs in terms of surface distribution of arguments (see Narasimhan, Budwig, & Marty,

2005). As Table 1 indicates, caregivers displayed a fairly equal distribution of transitive and intransitive verbs with either no overt arguments or just one argument. In fact, fewer than 10% of all transitive verbs appeared with two arguments.

Insert Table 1 about here

Table 1 shows that caregiver speech did not differ from what is known more generally about adult Hindi speech patterning to the extent that ellipsis was pervasive. If children learning Hindi are employing an analogical mapping procedure using the number and order of arguments as a strategy to acquire verb-argument structure correspondences, they could well be led astray by the paucity of overt arguments in adult speech for transitive verbs. Are there, therefore, transitivity errors in Hindi-speaking children? And is argument ellipsis in their own utterances random or structured in systematic ways?

Hindi-speaking Children's Ellipsis Patterns

In order to examine children's knowledge of verb transitivity, we took two diagnostic linguistic environments that overtly distinguish between transitive and intransitive verbs in spontaneous production data from the twelve 3- to 4-year-olds. These included the use of transitive and intransitive verbs with 'light' verbs and the use of case-morphology on arguments co-occurring with the verb. Based on predominant patterns in adult

usage, the child combination of an intransitive light verb such as *jaa* 'go' with a transitive verb, or of a transitive light verb such as *de* 'give' or *le* 'take' with an intransitive verb, was coded as a transitivity error. A second diagnostic context involved use of case morphology. Since Hindi is a split–ergative language, the subject of the transitive verb is marked with the ergative case-marker *ne* when the verb gets past/perfective morphology, otherwise it receives nominative case (i.e., null-marking). The single argument of the intransitive case is, with the exception of a small set of lexical exceptions, always in the nominative. So, case-marking errors children might make in assigning a verb to the wrong transitivity class include: (a) use of the nominative case on the subject argument of transitive verbs (misclassified as intransitive) in the past-perfective context, or (b) the use of ergative case on the subject of intransitive verbs (misclassified as transitive) in the past/perfective context.

The findings showed that the children did not make errors in combining light verbs with inappropriate main verbs. The intransitive light verb *jaa* never occurred with a transitive main verb, nor did the transitive light verbs *de* or *le* ever co-occur with an intransitive main verb. Further, in past/perfective contexts, ergative case-marking was never overextended to intransitive verbs, nor was null-marking used inappropriately

with transitive verbs. One explanation for Hindi-speaking children's accuracy might be linked, in part, to their awareness that patterns of argument realization in Hindi are not influenced by verb semantics alone but are also mediated by factors such as the information status of entities referred to in the discourse. Early recognition of such factors might motivate children's adoption of a cautious approach whereby they assume that while two arguments is consistent with a transitive classification, occurrence of a verb with a single argument or no argument at all is ambiguous between a transitive and intransitive classification. Children could be noticing that the same transitive verb can appear with no arguments or one or more arguments to describe the same situation. Therefore, it seems Hindi-speaking children would need to be more cautious about assuming a direct link between overt arguments and the transitivity of the verb in Hindi.

In order to investigate this issue further, we examined how Hindi-speaking children's patterns of argument realization are linked with information structure in their own spontaneous speech in naturalistic contexts. Following prior child and adult language research on "preferred argument structure" (Allen, 2000; Allen & Schroeder, 2003; Brown, 1998; Clancy, 1993; DuBois, 1987), we predicted that arguments that are lexical NPs

(versus null or pronominal forms) are more likely to be pragmatically prominent, as are arguments that are objects (O) or intransitive subjects (S) (versus transitive subjects [A]). We coded nominal arguments in our data from the twelve 3- to 4-year-olds as *pragmatically prominent* if information about their referents could not be easily inferred from nonlinguistic context or the preceding discourse, on the basis of factors such as animacy, type of speech act, recency of prior mention, and contrastiveness with other potential referents in the discourse and physical context (cf.; Allen, 2000; Allen & Schroeder, 2003; Clancy, 1993, 1997).

Our results showed that both the grammatical role and the referential form of realized arguments were linked to pragmatic prominence in early Hindi child language. While S and O arguments were pragmatically prominent (according to our criteria) 90% of the time on average, A arguments were prominent only about 39% of the time. Similarly, lexical NP arguments were more likely to be pragmatically prominent (95% of the time) as compared to pronominal or null arguments (64%). As early as 3 to 4 years of age, children appear to be aware of aspects of information structure in discourse and how they impinge on patterns of argument realization in Hindi.

Together, these findings suggest that despite massive argument ellipsis in the speech addressed to them, children as young as 3- to 4-years-old converge on the appropriate argument structure of verbs they hear. While this suggests that there are other cues to verb transitivity (and meaning) that children might draw on (e.g., verb morphology, physical contexts, and case-marking on realized arguments), the absence of transitivity errors in children's speech might also stem from their awareness of the influence of discourse-pragmatics on argument realization. The patterns of "preferred argument structure" in children's speech underlines the plausibility of such an explanation.

The Acquisition of Transitive and Intransitive Constructions in Hindi

We turn now to consider three kinds of questions related to the acquisition of transitive and intransitive constructions in Hindi in terms of what is known from cross-sectional and longitudinal work. First, we examine the issue of productivity. More specifically, do we have evidence that from an early age, Hindi-speaking children use the same verb productively with both causative and inchoative morphology? If so, how early can this be traced? Second, we look at semantic agency as it relates to the use of intransitive constructions. For instance, do children

reserve the use of intransitives for constructions involving a particular kind of agency (intransitive with animate subjects and/or intransitive constructions with inanimate subjects)? A third question here is the issue of child-directed speech in the Hindi-speaking sample. Is the best predictor of how children use a verb how their caregivers use the same verb in that session?

In reviewing these questions we begin in each case with our cross-sectional work with middle and low income Hindi speakers growing up in New Delhi. After consideration of what can be gleaned from the cross-sectional data, we will turn to a case study conducted with a middle-class girl between the ages of 2;3 and 2;8, studied for approximately one hour twice a month while interacting with her mother. There were a total of 12 sessions that were included in the case study analysis.[3] Our point here is to pull out general themes of productivity, interim solutions, and child-directed speech for a language other than English.

Productivity in the Use of Causative and Inchoative Forms

Given the claim that English-speaking children go through an extended period of using verbs in an item-based way, we can first ask whether this was also the case in Hindi. How do children use the inchoative and causative

morphological forms that link up with transitive and intransitive frames, and do they give evidence of using one and the same verb with both morphological markers in two distinct frames in the same session?

Beginning with the cross-sectional data, we can examine the profiles of the 12 children and their caregivers in terms of a productivity ranking based on a 4-point scoring system ranging from productive to non-productive. Participants considered "productive" were those who used a given verb with both transitive and intransitive frames and with both causative and inchoative morphological marking. Participants coded as "somewhat productive" used both intransitive and transitive frames and associated morphologically distinct endings but not with the same verb form. A third category called "less productive" was given to participants who used both construction types but only one or the other type of morphological ending (inchoative or causative); and finally, the remaining category of no productivity was assigned to participants who used neither transitive and intransitive frames nor causative and inchoative morphology with a given verb. Table 2 shows that the majority of caregivers and their children in the cross-sectional data set were categorized as "productive," showing an ability to use a verb with both constructions and

both morphological endings. Age did not seem to be a predictor per se of lack of productivity. Of the four children not showing productivity, none were in the youngest quartile. It is interesting to note that three of the four caregivers who had slightly lower productivity rankings and three of the four children who were classified as lower in productivity were in the lower SES ranking. Also important to note is that one upper class child who had a mother who showed minimal intransitive and inchoative use in the sample was a child (TA) who was classified as "productive" in the same session. This suggests that child-directed speech, at least within a given session, was not a firm predictor. It should be noted that the cross-sectional procedure does not allow one to examine whether children's uptake might take place in a subsequent session. This is a point that warrants further examination (see Chouinard & Clark, 2003 for further discussion).

Insert Table 2 about here

In the case study data, we found a similar trend. The child, except in the first month of the study, used at least two verbs in both the transitive and intransitive frame and with causative and inchoative marking in the remaining 10 sessions. As Table 3 shows, between the ages of 28 and 32 months the child used between two and five verb types per session with

both construction types and with the contrastive morphological markers.

Insert Table 3 here

Both the cross-sectional and longitudinal analyses lend little support for the idea that Hindi-speaking children or caregivers limit their uses of particular verbs to specific constructions. Early on in the second year as the children begin using verbs, they appear able to use them flexibly in distinct constructions with appropriate morphological marking for both the causative and inchoative. Thus the 12 children studied cross-sectionally and the one child followed longitudinally showed neither evidence of limited productivity nor item-based solutions to verb usage.

Animacy and the Intransitive Construction

A second question concerns whether and how children and caregivers make use of intransitive constructions. Of specific interest is whether Hindi-speaking children and their caregivers use the intransitive construction both with animate subjects, to adopt a viewpoint of animate subject + action, and with inanimate subjects, to express an inchoative perspective. While there is quite a lot of evidence for transitive construction use for prototypical agency in child language research (see Budwig, 1995; Slobin, 1985), whether and how children use

intransitives in uniquely childlike ways has been debated (see Budwig et al, 2001; Clark, 2001; Uziel-Karl & Budwig, 2003). We now first examine the cross-sectional data available and then to report on the longitudinal findings.

As a starting point for this analysis, we would like to note that both caregivers and their children in the Hindi sample linked the use of transitive constructions with animate agents and inanimate objects. This pattern follows what is already known for English and other languages. In contrast, when it came to intransitive constructions, the two groups differed. The children in the cross-sectional sample linked the use of intransitives with inanimate subjects 73% of the time. Only 26% of all uses of intransitives by these children had animate subjects. Interestingly, the children were not copying dominant constructional patterns found in the input they received. The caregivers linked the use of intransitives with animate subjects most of the time (67%) and only used inanimate subjects in inchoative intransitives 33% of the time. Table 4 illustrates this patterning.

Insert Table 4 About Here

The findings from the longitudinal analysis of the middle-class child studied between the ages of 27 and 32 months provide a different picture of animacy and verb

constructions. This child used intransitives primarily like the caregivers in the cross-sectional data, namely with an overall preference for animate subjects. Seventy-nine percent of all her uses of intransitives were with animate subjects, and she also used 100% of her transitive constructions with animate subjects. In contrast, a small number (21%) of her intransitive constructions included inanimate subjects. Early on these inanimate uses distinguished themselves by referring to one kind of scene, namely, one that we called goal-blocking (see Budwig et al, 2001; Uziel-Karl & Budwig, 2003). The following example illustrates this early usage:

(1) Child (30 months) trying to unsuccessfully open a box:

yeh *khul-tii* *nahII* *hae*

This open- IPFV.SG.F. not be.PRS.3SG.

It doesn't open

Over time, the child also used the inchoative perspective to talk about a resultative frame and to ask questions about objects, thereby moving beyond linking inanimate subject + intransitive construction with goal-blocking.

Why the cross-sectional and longitudinal data appear different remains an issue for future study. One possibility is that this might relate to subtle differences in data collection procedures, since the child in the longitudinal study was

observed in a wider variety of contexts. Another speculation involves the age differences of the children in the two studies. In the longitudinal study the child ranged in age from 2;3 to 2;8 and in the cross-sectional study, the children were aged from 2;8 to 4;3. The differences in usage may reflect a developmental difference in that the younger child studied longitudinally may limit use of intransitives to those primarily with animate subjects and occasionally may use intransitives with inanimate subjects contrastively to refer to events that involve goal-blocking. On the other hand, the older children studied cross-sectionally used intransitives for a wider array of meanings such as justifying actions (see example 4 below) in addition to events with negative results (see examples 1 - 3). This topic warrants further examination in the future with more children to sort out these differences.

The Role of Input in the Acquisition of Transitive and Intransitive Constructions in Hindi

Given that Hindi-speaking children use certain verbs productively once they start producing verbs, and given that in the cross-sectional data there appeared to be some discrepancy between how specific children in the Hindi-speaking sample used intransitive constructions when compared with their caregivers, the question is, what is the role of child-directed

speech for the Hindi-speaking child? We turn now to that question, first for the children in the cross-sectional study and then for our longitudinal sample.

Tomasello has claimed that the best predictor of how a child uses a given verb is how it is used in the speech the child hears (see Tomasello, 2003). Furthermore, as we noted earlier, Lieven and her colleagues (Lieven et al., 1997; Pine et al., 1998) have shown that English-speaking children follow dominant input patterns of verb use. Our Hindi-speaking sample shows that while young children are clearly influenced by patterns in the language they hear, they also go beyond them. We saw that most of the caregivers and their young children made use of verbs in both constructions productively, yet children and their caregivers often differed in how they used intransitives. A closer look at the use of constructions across stretches of interaction suggests that children can be encouraged to use particular types of constructions as they attempt to communicate in specific ways. The following analysis illustrates these tendencies:[4]

Example 2	Abhay (41 months) and Mother are playing with blocks:	
Mother	*is=ko*	*lag-aa-o*
	This= ACC	attach-CAUS- IMP

"(You) attach this"

Child: nahII ban-tii hae

No(t) form-IPFV.SG.F. be.PRS.3SG.

"(It) isn't getting made"

Example 3 Tanya (43 months) and Mother are playing

Mother: apne aap khol-o

By yourself open. CAUS-IMP

"(You) open (it) by yourself"

Child: nahIIkhul-taa

No(t) open-IPFV.SG.M.

"(It) doesn't open"

Example 4 Varan (47 months) and Mother are discussing a toy doll

Mother: aap=ne guDDii=kii eyes toD| Daal-ii naa?

You= ERG doll=GEN eyes-NOMbreak.CAUS put- PFV.SG.F. no

"You broke the doll's eyes, didn't you?"

Child: kahAA TuuT-ii hae?

Where break-PFV.SG.F. be.PRS.3SG.

"Where's it broken?"

Mother: toD|-ii hae

Break.CAUS-PFV.SG.F. be.PRS.3SG.

"(You) have broken (it)."

Child: kahAA TuuT-ii hae?

Where break-PFV.SG.F.

be.PRS.3SG.

"Where's it broken?"

Mother: aap=ne ...paer maar maar kar toD| di-yaa hae

You= ERG foot- NOM hit hit CONJ.PCTP

break.CAUS give-PFV.SG.M. be.PRS.3SG.

"You have broken (the doll) by kicking it (repeatedly)"

What holds all the children's uses of the intransitive constructions with inanimate subjects together in examples 2 through 4 is not the mother's prior use of that verb with an inanimate subject but rather that each of the children's intransitive constructions are part of a larger stretch of discourse in which the child is responding or justifying actions (or lack of actions). To this extent, even though the children may not be imitating the dominant patterning found in their caregivers' input, their usage can be related to the kinds of language the

children are receiving. Such language provides slots for certain kinds of event views. In this way, caregiver speech may be influencing the children's productions in a more indirect way by providing discourse pressure to use burgeoning linguistic resources (see Küntay & Slobin, 1996 for a related discussion of variation sets, and Hu, Budwig, & Smith, 2005, for an analysis of English). This point is central to keep in mind when designing novel verb tasks as well. The Hindi-speaking children's usage has been noted to be tied to particular discourse formats that involve salient perspectives about which children want to communicate. More specifically, early use of the intransitive with inchoative marking was often linked to acts of justification for why the child acted or did not act in particular ways. Unless experimental designs are sensitive to this, the experiments may not tap children's actual ability to produce the relevant constructions. In sum, these findings highlight the need to include a wider definition of child-directed speech that goes beyond exact repetitions by the child of frequently heard verbs.

Discussion

Our aim in this chapter was to illustrate a procedure for studying novel verbs within a construction framework referred to as a naturalistically informed novel verb training procedure.

We argued that novel verb training tasks must be designed with specific information about the interim solutions children make use of between the ages of 2 and 4. Only with experiments designed with such interim solutions in mind can researchers assess whether young children can make generalizations about novel verbs for which they have received training or whether children under age 3 are limited to item-based usage. The claim here is that if children develop interim solutions, and if novel verb training is based on the communicative functions of adult usage, then we may well be underreporting the abilities of 2-year-old children.

According to the three-step procedure we outlined, naturalistically informed novel verb training proceeds in three phases. First, analysis is made of usage for a group of children between 30 and 48 months of age to get a general sense of how 2- to 4-year-olds use transitive and intransitive constructions. In the second phase, more intensive longitudinal data can be studied for children acquiring verbs from early verb usage up through their third birthday in order to watch the patterning of forms and functions in more detail, over time, within the same child. Such data can also provide valuable information about the nature of the speech children hear and how caregiver and child language are related over time. In the final phase, researchers

can take what they have learned from the naturalistic observations and design experimental novel verb studies based on these findings, with greater ability to capture whether children between the ages of 2 and 4 can generalize novel verbs to patterns based on the semantic and pragmatic meanings found in naturalistic data.

The findings from the naturalistic analysis of Hindi-speaking children suggested little support for a phase of item-based usage. This could be because Hindi provides rich morphological marking on the verb that may make drawing the connection between transitive and intransitive constructions easier for the young child to grab onto. That is, it might well be the case that Hindi-speaking children are sensitive to distributional patterns of inchoative and causative morphological markings on the verb that highlight the alternation between transitive and intransitive constructions in ways not marked in English.

Although the Hindi-speaking children were able from the start to show they could go beyond item-based patterns of verb usage, this does not necessarily show that they immediately adopt adult-like solutions. Rather, the analysis suggests that the children adopted interim solutions for intransitive constructions. The transitive was used by all the

children, primarily to represent scenes involving an animate agent acting on an object. In contrast, the use of the intransitive varied across age. Early on, the child studied longitudinally from early verb usage reserved the intransitive construction to instances involving an animate subject. Thus, both animate and inanimate use was linked to talk about animate subjects. Over time, both the one child studied longitudinally and the slightly older children studied cross-sectionally came to use an increasing number of inanimate subject intransitives. Early on, they used inanimate subject intransitives only for talking about scenes with a negative result or with goal-blocking, but over time they came to use them in a more plurifunctional way to talk about a variety of scenes in which agent demotion was the focus. These findings suggest ways children might make generalizations that first meet their own developmental and communicative needs – generalizations that are not fully adult-like and that we have called interim solutions.

The findings from these naturalistic data suggest ways to conduct naturalistically informed novel verb training studies with Hindi-speaking children. For instance, one might design novel verb tasks that make use of the argument realization patterns in terms children favor with nominal and pronominal arguments as well as argument ellipsis. Furthermore, in pulling

for intransitive constructions it seems important to not simply ask questions that focus on the patient. Early on, Hindi-speaking 2- and 3-year-olds might restrict the use of inanimate subject intransitives to scenes that report negative outcomes. Here it would be optimal to consider training children with novel verbs for actions that at times involve having toys malfunction. Questions that focus on the patient in scenarios involving malfunctioning toys may be more likely to be responded to by young children, and only over time does it seem Hindi-speaking children would be likely to use a novel verb with the relevant transitivity and case-marking with a wider range of patient-focused questions.

In sum, this chapter follows in a recent tradition of focusing on constructions as the unit of analysis in understanding children's early acquisition of language. In verb development, this suggests that further attention should be given to the crosslinguistic study of constructions. For languages rich in verb morphology, the explicit marking associated with transitivity may offer routes for speeding up the onset of generalizations. A further claim of this chapter is that in between item-based usage and adult-like generalizations may lie an extended period of development in which children generalize verbs based on a variety of interim solutions. Interim

solutions represent an intermediate phase between local item-based productivity that is highly dependent on input and speaker's attempts to link verbs to larger units of meaning such as transitive and intransitive constructions. Finally, this chapter has outlined a three-step procedure for designing novel verb studies that draws upon what is known about children's use of naturally occurring verbs. We claim that unless novel verb training is consistent *in function* with what children at a given stage of development make use of for interim solutions, it will be difficult to assess whether their lack of generalization of novel verbs is due to the incongruence in form-function patternings or to a broader deficit in the ability to generalize.

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Footnotes

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2 Glossing conventions are based on the Leipzig Glossing Rules (http://www.eva.mpg.de/lingua/files/morpheme.html): 1:first person; 2:second person; 3:third person; ABL:ablative;ABS:absolutive; ACC:accusative; AUX:auxiliary; CAUS:causative ; CONJ.PTCP.: conjunctive participle ;DAT:dative;ERG:ergative; F:feminine; FUT:future;GEN:genitive;IMP:imperative; INF:infinitive; INS:instrumental; INTR:intransitive; IPFV:imperfective; LOC:locative; M:masculine; NOM:nominative;PFV:perfective; PL:plural; PRS:present; PROG: progressive; ;PST:past; SG:singular; TR:transitive. Also note that the sound <II> represents nasalization of the long <ii> vowel. The '| 'sign after

"D" represents a flapped retroflex consonant (versus non-flapped).

3 A fuller description of this work can be found in Srivastava et al., 2005.

4 It is important to note that in Hindi, use of an active transitive with animate subject implies intentionality. For instance, Snell (2000, pp. 242-243) argues that in Hindi, transitive and intransitive inchoative patterns mark a distinction between deliberate and non-deliberate action. If a speaker uses the transitive construction, it would imply that the happening was deliberate, while with the inchoative intransitive this interpretation is not rendered.

Table 1

Overt Arguments (%) in Hindi-speaking Caregivers' Speech to Their Children

Construction Type	Number of Arguments		
	0	1	2
Intransitive (n=559 utterances)	52	48	-
Transitive (n=854 utterances)	44	49	7

Table 2

Productivity of Transitive and Intransitive Constructions and Verb Morphology

	Productive		Some Productivity		Minimal Productivity		No Productivity	
Dyad	Caregiver	Child	Caregiver	Child	Caregiver	Child	Caregiver	Child
AB	X	X						
AJ	X	X						
AK	X[1]	X						
AM	X	X						
AN	X[1]	X[1]						
AR			X				X[2]	
CH			X				X	
IS	X			X				
LI	X[1]						X	
NI			X				X	
TA		X			X[3]			
VA	X	X[1]						

X[1] = with only 1 verb

X[2] = participant used only 1 verb in session

X[3] = participant had minimal intransitive and inchoative use

Table 3

Distribution of verb types used in transitive only, intransitive only, and both constructions by age.

Age (months)	Transitive only	Intransitive only	Both construc-tions		Trans	Intrans	Total number of verbs used
27	11 (73%)	4 (27%)	0				15
28	6 (46%)	6 (46%)	1 (8%)	'open'	*khol*	*khul*	13
29	11 (55%)	6 (30%)	3 (15%)	'make'	*ban-aa*	*ban*	19
				'look'	*dekh*	*dikh*	
				'do'	*karte*	*x- kar*	
30	11 (44%)	9 (36%)	5 (20%)	'make'	*ban-aa*	*ban*	25
				'open'	*khol*	*khul*	
				'break'	toD|	TuuT	
				'cut'	kaaT	kaT	
				'do'	*kar*	*x-kar*	
31	11 (52%)	8 (38%)	2 (10%)	'do'	*kar*	*x-kar*	21
				'eat'	*khaa*	*khaataa* (habitual)	
32	15 (50%)	11 (37%)	4 (13%)	'make'	*ban-aa*	*ban*	30
				'do'	*kar*	*x- kar*	
				'attach'	*lag-aa*	*lag*	
				'eat'	*khaa*	*khaataa* (habitual)	

x is a noun

For verbs like *kar* we used the "*kuch* test" (see Narasimhan, Budwig & Marty, 2005). Can you say *X ne kuch karaa*? (Did X do something?), if yes then the verb has an object. If *kar* was used as a light verb with another noun (complex predicate) we coded it as an intransitive.

Table 4

Animacy of Transitive Arguments (%): Hindi-speaking Caregivers and Children

Participant	Animacy		
	Animate	Inanimate	Ambiguous
Children	26%	73%	1%
Caregivers	67%	33%	1% -