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A Developmental-Functionalist View of the Development of Transitive and Intransitive Constructions in a Hindi-speaking Child: A Case Study

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Abstract. The present study examines the acquisition of transitive and intransitive constructions in a Hindi-speaking child using a developmental-functionalist approach. This approach posits that children construct interim solutions that cluster linguistic forms with semantic and pragmatic meanings en route to adult-like usage. We report findings from a longitudinal case-study of a child who ranged in age from 2;3 to 2;8 of age. Analysis draws upon a corpus of videotaped naturalistic mother-child interactions over a six month period. All uses of transitive and intransitive verbs by the child were isolated and coded in terms of a) construction type, b) semantic animacy of the sentence subject, and c) pragmatic function. Findings reveal that initially the child was able to use multiple constructions (e.g., *I made it* and *It is made)*, but each construction was tightly linked with a separate function. For instance, a transitive construction early on was used by the child in an attempt to use language to bring about change (control act) and comprised of an utterance with an animate subject acting on an inanimate object. The intransitive with an animate subject was used as an assertion and an intransitive with an inanimate subject was used to talk about a scene involving goal blocking. Only gradually did the child begin to encode forms with multiple functions. Discussion focuses on the multiple factors that influence the course of grammatical development and the importance of the case study method as early steps in theory building and testing for the present study.

Key words: constructions, functional approach, development, case study, Hindi

A remarkable feat of the human child is the movement from preverbal babbles to the ability to produce and understand multiword utterances. One view gaining momentum among developmental psycholinguists draws upon functional linguistic theorizing and emphasizes that language develops in relation to the communicative context in which it is used (Budwig, 1995; Goldberg, 1995; Tomasello, 1992, 2003). Such an approach contends that children experience language in the form of meaning units called constructions instead of as neat and discrete packages of sounds, words, and abstract grammatical rules. This view that holds that constructions are the fundamental unit of linguistic competence has interesting implications for the processes of language acquisition as well as developmental psychology (Budwig, 2004). Slobin (1985) and Goldberg (1995) among others contend that constructions involving basic argument structure are shown to be associated with dynamic scenes: "experientially grounded gestalts" (Goldberg, 1995 p. 5) or bundles of meaning that designate a basic pattern of experience, such as that of someone volitionally transferring something to someone else, someone causing someone to move or change state, someone experiencing something, something moving, so on. Slobin (1985) posited that children's early linguistic competence is structured by such important scenes in their lives for which they learn canonical sentence schemas. [1]

Most functionally based theorists (also known as usage based theorists) propose that the path of syntactic development is from concrete, lexically specific to more abstract constructions proceeding in a gradual piecemeal fashion (Tomasello, 2003). The question then arose of how concrete or abstract children's early sentence schemas are. The degree of concreteness of children's early constructions has been measured in terms of their creativity or productivity with their language. Researchers have focused on whether a child can use a verb in a sentence frame in which she has not heard it used. For example, can a child on the basis of hearing a verb like *roll* just in an intransitive construction like *The ball rolled* then go on to produce that same verb in a transitive construction like *The boy rolled the ball,* without having heard it used in this frame? If children have somewhat abstract meanings built around transitive and intransitive frames such that, for instance, a transitive frame is associated with a meaning of direct causation, then upon learning a new verb like *roll* children could be expected to use it productively in a transitive frame. Alternatively, some work has suggested that children start with piecemeal solutions such that a given verb *roll* is only used in ways it has been heard and thus could not be

expected to be used productively (see Tomasello, 2003). [2]

Usage based theorists have used two basic methods to study children's productivity with constructions, that is, their use of language in ways that go beyond what they have heard as input from adults. The first method is the observational method of analyzing children's spontaneous speech in naturalistic interactions with others. This method focuses on looking at all the ways in which a child uses verbs in constructions. This method can be paralleled with a case study method in that the focus is on investigation of a theoretical construct in a small sample of children to gain an in-depth view of the process. The second method is the experimental method, which involves teaching children novel verbs and seeing the different ways they can use them (Tomasello, 2000). The idea to introduce novel verbs has been implemented because researchers were concerned that the small amount of observational data they collect on any given child would leave open the question of whether the child received input that was not captured in a given recording session. Novel verbs have the advantage of offering the researcher clear evidence on what input has been given to a child for a particular verb. Our own ongoing research suggests a third option that merges these approaches (see Budwig, Narasimhan, & Srivastava, 2005; Smith & Budwig, in press, 2005; Srivastava, Budwig, & Narasimhan, 2005). First, careful longitudinal case study work is conducted to better understand how children make use of transitive and intransitive constructions. Such work paves the way for experimental follow up (see Smith & Budwig, in press). [3]

The present study contributes to this approach by documenting in a longitudinal study how one Hindi-speaking child uses transitive and intransitive constructions and provides the first step in the process of trying to better understand the development of constructions in a language other than English. We turn now to review prior literature on transitive and intransitive constructions, focusing on both observational and experimental work on English and then to consider what is known about children acquiring languages other than English. [4]

1.1 *Observational Studies of English-speaking Children's Transitive and Intransitive Constructions*

The case-study approach has a long and venerable tradition in the social sciences, with some of the greatest advances in thinking coming from case studies rather than from large scale experiments or survey studies. The field of language development, in particular, is checkered with case studies that have transformed the field. These studies are generally conducted on a small number of children with a focus on specific set of issues of interest to the researcher (see Bloom, 1970, 1991; Bowerman, 1990; Brown, 1973; Tomasello, 1992). Usage based theorists have been interested in the communicative contexts in which language develops. Therefore, observational studies have been used extensively by these researchers as records of the child's interactions with others in a more or less continuous manner, providing a rich source of data of not only what the child said or did but also the context in which she did so (see Budwig, 1995; Tomasello, 1992). Such in-depth insight of a child's ability to use language spontaneously and in a variety of pragmatic contexts would be difficult to assess in large populations (Budwig, 1995; Tomasello, 1992). Moreover, looking at a child's language use in depth and scrutinizing the contexts in which she uses language helps researchers seek out "both what is common and what is particular about the case" (Stake, 2000, p.238). Additionally, case studies provide excellent grounds for refinement of theory and can be used as explorations leading up to generalizations of a theoretical construct (Stake, 2000). [5]

A landmark study that led to the development of the Verb Island Hypothesis is an extensive diary study conducted by Tomasello (1992). Tomasello (1992) analyzed the different ways his English-speaking daughter used each of her verbs during the period from 15 to 24 months of age. The major finding of this study was that almost all of this child's early verbs were used in a very limited manner, in one or two construction types. So for example, *Daddy break cup* and *Mommy break cup* are the same construction type because both have an animate agent (daddy or mommy) acting on a inanimate object (cup), whereas *cup broke, break cup,* and *Mommy break cup* are three different construction types. Each of these constructions is a linguistic marker of slightly different representations of entities and actions as connected in an event. For example, *cup broke* is an intransitive with a focus on the cup. There is no mention of the agent that caused the action of breaking. *Break cup* is a transitive but the agent has been omitted by the speaker (Tomasello, 1992). Moreover, at any given developmental period, Tomasello's daughter's verb usage was uneven such that some verbs were used with just one construction type while others were used in a number of constructions. Thus each verb seemed like its own island of organization with no link to how other verbs were being used. The child's usage of a given verb matched closely to the adult's usage. [6]

This phenomenon was referred to as the Verb Island Hypothesis, whereby Tomasello (1992) claimed that children's early multiword utterances revolve around particular verbs that themselves draw heavily from input patterns the child has heard. According to the Verb Island Hypothesis, children are unable to use verbs in novel constructions that go beyond what they have heard from adults. He suggested, therefore, that children do not possess abstract schemas that would enable them to be generative with their grammar. This means that the grammatical categories that children are working with are not such verb-general things as "subject" and "object," or "agent" and "patient," but rather such verb specific things as "hitter" and "hittee," "sitter" and "things sat upon." [7]

1.2. *Experimental Studies of English-Speaking Children's Transitive and Intransitive Constructions*

One concern expressed about naturalistic studies has been that it is difficult to know exactly what input children are getting because sampling only gives a small amount of data a given child actually receives (Tomasello, 2000). To get around this, Tomasello and colleagues have suggested that it is important to introduce novel verbs and watch their development to better understand developmental processes (see Tomasello, 2003). Using an experimental paradigm of training children to use novel verbs, Tomasello and Brooks (1998) found that English-speaking children produce simple transitive and intransitive utterances in their speech on a verb-specific basis. They taught 2- and 2-and-a-half-year-old English-speaking children two novel verbs (*meek* and *tam*) for highly transitive actions in which an agent did something to a patient. Each child learned one of the experimental verbs in a transitive construction such as *The puppy is meeking the ball* and the other verb in an intransitive construction such as *The bear is gonna tam.* The children were then given opportunities to use their newly learned verbs in discourse situations that encouraged use of a different construction than the one in which the child had learned the verb. The experimenters found that 2-year–old children almost never produced an utterance using a novel verb in anything other than the construction in which it had been modeled. For instance, this group of children did not produce a transitive construction (*He's meeking the ball*) with the intransitively introduced verb (*The ball is meeking).* Children at 2.5 years of age were somewhat productive, but still a large majority of them avoided using the novel verbs in constructions that were not modeled by the experimenter (see also Brooks & Tomasello, 1999). Therefore, Tomasello claimed that English-speaking children are unable to transfer their knowledge of word order from their existing item-based constructions to the novel items until after the age of three years. These findings indicate that young children's early syntactic marking (for example, the word order in English language) is learned for different verbs on a one-by-one basis. [8]

1.3 *Crosslinguistic Work on Transitive and Intransitive Constructions*

Crosslinguistic studies have gained increasing importance in the study of language development. Researchers have focused on crosslinguistic work to identify universals of development. However, it has also been established that properties of individual languages influence the course of development (Slobin, 1985; Bowerman, 1985). Bowerman (1985) argued that "the way in which languages organize meaning ...[is] an integral part of their structure" (p. 1313), and these in turn influence the pattern of acquisition. [9]

To date very little crosslinguistic work exists on children's acquisition of verb argument constructions from a usage-based perspective. An exception to this is a study conducted by Berman (1993) on Hebrew-speaking children (see also Uziel-Karl & Budwig, 2003). In Hebrew a change in verb argument frame (i.e., transitive to intransitive and vice-versa) entails a change in verb morphology. The switch between transitive and intransitive constructions is done "through the set of *binyan* 'conjugation' patterns" (p. 642). These patterns comprise of a cluster of features such as word order, marking of case, number, gender and person and morphological marking on the verb. While children acquire most of the features of the *binyan* conjugation patterns as early as two-and-a-half-years of age; "they still appear to lack ... [a] productive command of morphological marking of transitivity value on the verb" (p. 644). [10]

Berman (1993) designed an elicitation study to examine two, three, and eight year olds' ability to use an intransitively introduced novel verb in a canonical transitive construction. She wanted to see if children of these three age groups are able to successfully change a verb with the appropriate morphology and syntax from a transitive construction to intransitive construction and vice-versa. Using an experimental paradigm, she presented children with familiar verbs that have conventional *binyan* variants in the established lexicon with reverse transitivity (i.e., a given verb has both transitive and intransitive form); and novel verbs, which did not have morphological alternates with reverse transitivity in the established lexicon. The children were shown a pair of pictures representing the same activity from different points of view. The experimenter would describe one picture in the canonical transitive or intransitive construction depending on what the picture depicted. She then used a sentence completion task to describe the other picture, whereby the child had to complete the sentence using a novel transitive or intransitive construction. [11]

Berman found that like English-speaking children, there was a steady increase in the proportion of normatively correct *binyan* alternations to express distinctions in syntactic transitivity over age. Although the young children in her sample were able to successfully alternate *binyan* patterns, it was restricted to the use of some pairs. Overall children did better on the known than novel part of the elicitation procedure. This ability rose sharply between the ages of three and four. From her findings, Berman suggested that children might be proceeding from item based learning to class based knowledge of the inter-relations between particular forms and only subsequently to a more integrated understanding of the morphological transitivity as a whole. [12]

However, compared to the English-speaking children, the children studied by Berman looked surprisingly productive. She contends that the reason for younger children's success on some of the items may be explained in terms of interaction between various factors such as semantic complexity, the availability of productive syntactic alternatives for a

given verb in the Hebrew language, and the degree to which a given verb form is favored in actual usage and in the input to children compared to other verb forms. Thus even very young children were able to alternate between the transitive and intransitive constructions for verbs belonging to a particular pattern, because it was very frequent in adult usage, was semantically the simplest, and syntactically the verbs could be used as transitive and intransitive to the same degree. Another factor that influenced children's performance was the degree of familiarity with the verbs and the perspectives typically selected by the caregiver and the child in using the verbs. Thus 2- and 3-year-olds correctly changed the transitive form of verbs such as *spill*, *tear*, *break* to intransitive form rather than vice-versa because verbs such as these that have a negative connotation are "used with a patient perspective to refer to highly salient change-of-state events, marked by the intransitive inchoative form in the Hebrew language" (p. 664). In contrast, children gave the same amount of correct responses in both directions for a neutral verb like *open.* Berman adds that the low rate of errors in switching from transitive to intransitive and vice-versa in younger children may also be explained in terms of "Language–Particular factors" (p. 664). It is possible that children recognize the transitivity values of different *binyan* forms early in their acquisition of the system. However, Berman suggests that the younger children rely more on contextual cues and lexical familiarity in order to produce alternations than older children. She concludes that in older children the "knowledge of the system" (p. 664) is established, enabling them to rely less on external cues. [13]

There is now increasing crosslinguistic evidence for the piecemeal process of language acquisition. Uziel-Karl & Budwig (2003) conducted a longitudinal examination of two Hebrew-speaking children's use of non-agent subjects, focusing on the middle constructions[1]. Middles were utterances where the subject was affected by the verb in some way (e.g., *the juice spilled*). Hebrew has been of special interest to most crosslinguistic researchers because it is typologically different from English. As mentioned above, it encodes voice distinctions (active vs. passive vs. middle) by alternating a particular consonantal root in different verb patterns. The findings from this study showed that the children initially linked non-agent subject only with middle voice verbs. Moreover, they used non-agent subjects mostly with inanimate subjects that were used exclusively with the pronoun *ze* – 'it'. Only gradually did the children begin to extend the variety of pronouns to include other pronouns that referred to inanimate entities as well as ones that referred to animate entities. The restricted use of their verb usage was further highlighted by the fact that middle constructions were used first with a cluster of verbs that portrayed negative happenings (e.g., *fell, broke, got stuck*). [14]

Taken together these findings highlight the piecemeal and gradual process of language acquisition. However, on closer examination of the studies reviewed above it seems that young children may neither be working at a verb-by-verb basis nor at an abstract level but rather at some intermediate level where they are sensitive to typological, semantic, and contextual cues (see also Budwig, Narasimhan, & Srivastava, 2005). The systematic patterns of form-function constructed by children in both the studies mentioned above also suggest that children are constructing some sorts of meaning clusters by linking certain semantic and pragmatic factors together. [15]

1.4 *The Developmental-Functionalist Approach-Explicating the Nature of Developmental Path.*

While it has been well-accepted that children move from concrete understanding of verb constructions to more adult like constructions, very little has been said about the nature of this developmental process. Much prior acquisition work as summarized above has primarily focused on child's use of lexically specific patterns at a given developmental stage. Because so much of the empirical work has been based on cross-sectional samples rather than careful longitudinal analysis based on the case study method, this is hardly surprising. Budwig (1995, 2001) has attempted to explicate the nature of the developmental process by focusing on the changes in the form-function pairings over time using case studies as an important tool. This framework for studying grammatical development, called the developmental-functionalist approach, highlights the role of semantic and pragmatic meaning clusters in early constructions. Budwig (2000, 2001) argues that from early on, children recruit argument structure constructions to adopt perspectives on scenes for discourse purposes. Transitivity is viewed as a deictic anchoring for how the speaker wants to be understood (Budwig, Clancy, & Fisher, 2000). Therefore, the use of transitive and intransitive sentences is a dialogically constructed way for speakers to position themselves in relation to others in the world. On this view, children are dynamically selecting a vantage point based on their own specific communicative purposes. Coming from this view, Budwig, Narasimhan, and Srivastava (2005) suggest that children may neither be working verb-by-verb nor at an abstract rule level, but rather at some intermediate level by actively organizing what they take from input into something that is more systematic and productive than a mere inventory of rote-learned sentences. The authors argue that children are constantly constructing meaning clusters comprised of semantic and pragmatic factors wherein they link forms with functions that meet their specific communicative needs. These meaning clusters serve as interim solutions for children en route to more adult like constructions and are suggestive of more productivity with language than has been reported for English-speaking children. [16]

The idea that children's unique communicative goals pressure them to deviate from adult patterning was also explored in a crosslinguistic study by Budwig, Stein and O'Brien (2001). The authors examined the frequency and function of English- and German-speaking children's talk about non-agent inanimate subjects to see whether children start with

prototypical event perspectives and only gradually branch out to mark less prototypical events, or whether they follow the input of the target language from very early on. Their multilevel functional analysis revealed that children distinguished between agent and non-agent subjects from early on and also used two different construction types (middles and intransitives) to distinguish contrastive ways of introducing non-agent subjects into the discourse. Middles were utterances with "syntactically active subjects which are semantically affected by the action of the verb" (p. 56) such as *the jar broke, the doors won't open.* The intransitive constructions were those in which the subject was not affected by the predicate but played a causal role in transferring the action described (e.g., *It [=helicopter] flies*; *the ambulance came; now it [=bulldozer] will dump*). English-speaking children linked middles to report events in which they seemed to face resistance from the environment to their own intentions and goal-directed actions (e.g., *the doors won't open*; when the child was attempting to open the doors and couldn't succeed). On the other hand, these children linked the intransitive constructions with non-agent inanimate subjects in their attempts to create a new play frame (e.g. *It [=helicopter] flies* was spoken by a child who had been pretending to fly the helicopter and now wanted his partner to engage in a new play frame). [17]

While the German children's use of intransitive construction with non-agent inanimate subject was similar to American English-speaking children, the two groups of children differed in their use of middle constructions. The German children made use of middle constructions to describe normative ways objects could be related to one another. Such usage tended to refer to instances of objects belonging, fitting, or going with one another in particular ways (e.g.,*da kommen die hin* 'there they fit inside'; *das gehört dem Teller* 'that belongs (with) the plate') (p.62). In talking about resistance to goals and intentions, German children used subjectless constructions rather than non-agent subjects (see examples 1 and 2 below from Budwig, Stein, & O'Brien, 2001, p. 64). [18]

1. Child was attempting to build up block tower
   umgefallen!
   'fallen down'
2. Child accidentally knocked over a "garage" built out of blocks
   kaput gemacht!
   'made broken'

This study illustrates the ways the English- and German-speaking children in this study use the two types of non-agent constructions to distinctly shift perspective away from a prototypical transitive frame. The findings underscore the importance of the functionalist perspective in highlighting the unique linkages children make between active transitive, active intransitive, and middle constructions with a range of semantic and pragmatic factors in order to index vantage points particularly salient to them. The authors suggest that the mere usage of forms does not imply that children's usage is adult-like. Over ontogenetic time, there is a dynamic relationship between language forms and functions. This implies the need to examine more than the frequency or presence or absence of a form; language needs to be examined in terms of multiple levels including a focus on language forms and semantic and pragmatic functions. [19]

1.5 *The Present Study*

Usage based theorists have emphasized that in addition to expecting children's learning to be gradual and piecemeal, the acquisition of particular linguistic structures depends heavily on the specific language to which a particular child is exposed (Budwig, 2001; Slobin, 1985; Tomasello, 2003). Moreover, the few studies examining children acquiring languages other than English show that although the development of children's early construction use is protracted, there is evidence that before the age of three, these children are able to generalize individual verbs to form transitive and intransitive constructions (Berman, 1993; see Budwig, Narasimhan, & Srivastava, 2005, for an account of crosslinguistic work on constructions). Budwig (2001) contends that all children from the start concern themselves with perspective taking. The ability to adopt perspective undergoes development itself and these developments may vary with children living in distinct cultural communities that speak different languages. Therefore, more crosslinguistic work is needed to better understand the relationship between the use of various kinds of linguistic markers and the scenes with which children link them when adopting various perspectives over developmental time. The findings from crosslinguistic work on acquisition of verb argument structure suggests that children between the ages of 2-and-a-half and 4 will show evidence of being able to move beyond item-based learning. An important factor may be that languages that use linguistic markings to overtly classify individual verbs as transitive and intransitive may make it easier for children acquiring such languages to distinguish between the two perspectives and thus be more productive with verb usage. [20]

The focus of the present study is to examine longitudinally the nature of interim solutions that children create in the transition from the very restricted use of transitive and intransitive constructions to the more sophisticated adult-like usage when learning Hindi. Specifically, we aim to understand the semantic and pragmatic functions of transitive and intransitive constructions of a Hindi-acquiring child. Hindi presents an interesting contrast to English because in Hindi, many individual verbs are overtly marked as being causative (transitive) and inchoative (intransitive) (Budwig, Narasimhan, &

Srivastava, 2005; Narasimhan, Budwig, & Murty, 2005) . For example, an English-acquiring child has to learn the verb *roll* which can then be used in the same form in the intransitive, *the ball* ***rolled*** and the transitive *the boy* ***rolled*** *the ball.* The case is quite different for a Hindi-acquiring child. For her, the Hindi verb *luD|hak,* which means 'roll', is structurally different for the two syntactic constructions. It has to be affixed with a causative marker *-aa* to make it transitive (examples 3 & 4). [21]

3.	Intransitive	*gend*	*luD|hak-ii*	
		ball	roll-sg.fem.perf.[3]	
		'The ball rolled.'		
4.	Transitive	*laD|ke=ne*	*gend=ko*	*luD|hak-aa-yaa.*
		Boy=erg	ball=acc	roll-CAUS-sg.msc.perf.
		'The boy rolled the ball.'		

To date there have been very few studies examining the nature of children's constructions in Hindi. The major work that exists for Hindi is cross-sectional work (see Budwig & Narasimhan, 2004). The authors' cross-sectional study of Hindi-speaking children ranging in ages from 2;10 to 4; 3 showed that even the younger children used some verbs in both transitive and intransitive constructions with the appropriate markings as illustrated above in examples 3 and 4. These children also aligned transitive and intransitive constructions with distinct semantic and pragmatic functions that did not necessarily replicate the adults' usage. For instance, the caregivers primarily used animate subjects in intransitive constructions (animate=67%; inanimate=33%), but the children preferred inanimate subjects in intransitive constructions (animate=26%; inanimate=73%), thereby showing a contrast with the caregivers' patterning. The case was similar for the pragmatic functions in which transitive and intransitive constructions were used. The caregivers used transitive and intransitive constructions in similar pragmatic contexts, to regulate children's behavior. However, children tended to use intransitive, especially with inanimate subjects to respond to adult's claim that the child had caused a negative event to happen (e.g., breaking the doll) and to justify self's actions. These findings suggest that while it is evident that young children's usage of constructions is not adult-like, these children link the transitive and intransitive constructions with a cluster of semantic and pragmatic meaning systems that meet their own communicative needs. A central tenet of the developmental-functionalist approach is that these meaning systems themselves undergo change over the course of an individual's development. However, a longitudinal analysis based in the case study method is needed to gain a fuller understanding of the developmental process. [22]

Therefore, the overall goal of the present study was to examine the sorts of patterns that emerge for the linking of semantic and pragmatic functions with the child's use of verbs in the transitive and intransitive constructions over a period of six months. The specific research questions that have guided the present study are:

1. How does the child distribute the use of verbs in transitive and intransitive constructions? More specifically, the focus was on whether the child uses the same verbs in both transitive and intransitive constructions with the appropriate markings or whether she restricts the use of particular verbs to particular constructions. [23]

2. Do the child's uses of transitive and intransitive frames differ systematically in terms of animacy of subject and object of verb? Prior work suggests that children tend to link the transitive construction with an animate subject, since the transitive construction marks a scene involving prototypical agency with an animate doer acting to bring about change. On the other hand, the intransitive construction is more complex, since an intransitive subject tends to be either animate or inanimate (Budwig & Narasimhan, 2004; Smith & Budwig, in press; Uziel-Karl & Budwig, 2003). [24]

3. Finally, does the child link the use of transitive or intransitive constructions with specific pragmatic functions? For instance, previous studies found that the intransitive inanimate subject construction was used by English-speaking children in an attempt to get his partner to start engaging in a new play frame (Budwig, Stein, & O'Brien, 2001). In their study of Hindi-speaking children, Budwig and Narasimhan (2004) found that intransitive constructions with inanimate subjects were used by children to deny carrying out an action commanded by an adult. [25]

In answering the above questions related to the distribution of construction types and their linking with semantic and pragmatic meaning clusters this study will help us better understand the developmental process underlying the transition from early lexically specific, item-based usage to the more adult-like use of transitive and intransitive constructions. [26]

2. Method

2.1 *Participants and Procedure*

This study is based on a larger study conducted by Budwig and Narasimhan (2004) on the development of transitive and intransitive constructions in 3-4 year olds.[4] The present study is a longitudinal case study of a girl belonging to a middle income family residing in New Delhi, India who was acquiring Hindi as a first language. The videotaped data used in this study is a subset of recently collected field data by Narasimhan with support from the Max Planck Institute, Nijmegen, Netherlands (Narasimhan, 2000). The observations are spread over a period of 6 months, with the age of the child ranging from 2;3 to 2;8. The child was videotaped in her home along with a caregiver, mostly the mother, for approximately 50 minutes twice a month. During a session the child and caregiver engaged in 3 or 4 activities such as play with blocks, doll play, and looking at a picture book. [27]

2.2 *Coding*

All data were transcribed using a modified version of the CHAT system (see MacWhinney & Snow, 1985). All clauses containing verbs were isolated and then coded using a multilevel coding scheme adapted from Budwig and Narasimhan (2004) to examine the following patterning of constructions. [28]

2.2.1 *Construction type of clause.* The clauses were coded as transitive, intransitive, or other. An utterance was coded as transitive if the infinitive form of the main (simple or compound) verb had two arguments and if the subject took the ergative marker *ne* in the past/perfective (includes ditransitives). If the verb took only one core argument, it was coded as an intransitive (see Narasimhan, Budwig, & Murty, 2005 for further details of the coding criteria). Passives allow only one argument of a transitive verb to appear and hence were coded as an intransitive (e.g., *darvaazaa kholaa gayaa* – 'the door was opened.'). Physical context was used to disambiguate cases in which the linguistic framing was ambiguous. [29]

2.2.2 *Animacy.* At the second level, the utterances were coded for animacy of arguments. For the transitive construction, both the subject and object of the construction were coded as either: a) animate (e.g., person, figurines that were treated as human–like) or b) inanimate (e.g., blocks, book). The subject of the intransitive construction was also coded for animacy. We wanted to see whether the child is contrasting between transitive and intransitives constructions in terms of animacy of the subject of the two types of constructions. Also of interest was the child's use of animacy to distinguish between the subject and object within the transitive construction. Additionally, since the intransitive construction can have either an animate or an inanimate subject, we wanted to see whether the child made use of animacy to distinguish clusters of meaning indexed within the broader intransitive construction. [30]

2.2.3 *Pragmatic levels.* Pragmatic coding assessed the potential relationship between the syntactic frames and the communicative functions they serve. The focus was to see if the child was systematically distinguishing between the transitive and intransitive constructions by linking each with specific pragmatic functions or whether she was linking all her utterances with a range of functions. The coding scheme was adapted from Budwig (1995) using the following codes to categorize the communicative goal of the utterance containing transitive and intransitive constructions: [31]

2.2.3.1 *Control acts*: An utterance was coded as a control act when the child's utterance was intended to bring about a change in the hearer's actions through directives or requests (e.g., the child pretends a block is an ice cream and gives it to the researcher saying: *ice-cream khaa lo* –'eat the ice-cream') or if the utterance was intended to influence child's actions such as in soliciting permission (e.g., the child wants to feed the doll who is in her mother's lap, so she asks her mother: *our dUU?.*- 'should (I) give more?'). [32]

2.2.3.2 *Non-control acts* were utterances that did not attempt to bring about a change in the environment but rather, were about given states in the world. Non-control utterances were further coded as: Assertions (e.g., the child closes a box, then looks at the researcher and says: *mAE ne band kar diyaa* – 'I have closed (it)'), and Questions (e.g., the mother is pretending to put a doll to sleep. The child asks her mother: *so gayaa?*- 'is (he) asleep?') [33]

2.2.3.3 *Multifunction:* Utterances that were at the same time an assertion or a question about the state of the world and a request to perform an action (e.g.,*yeh rotaa nahII h|e-* '(he) doesn't cry.' In this context, the child gives a doll to the researcher to hold while she wants to play with another toy. The researcher says to the child that the doll cries and the child, in an attempt to get the researcher to hold the doll responds as above). [34]

2.2.3.4 *Uncodable:* cases where the pragmatic function was not clear from observing the video recording. [35]

2.3 *Analysis*

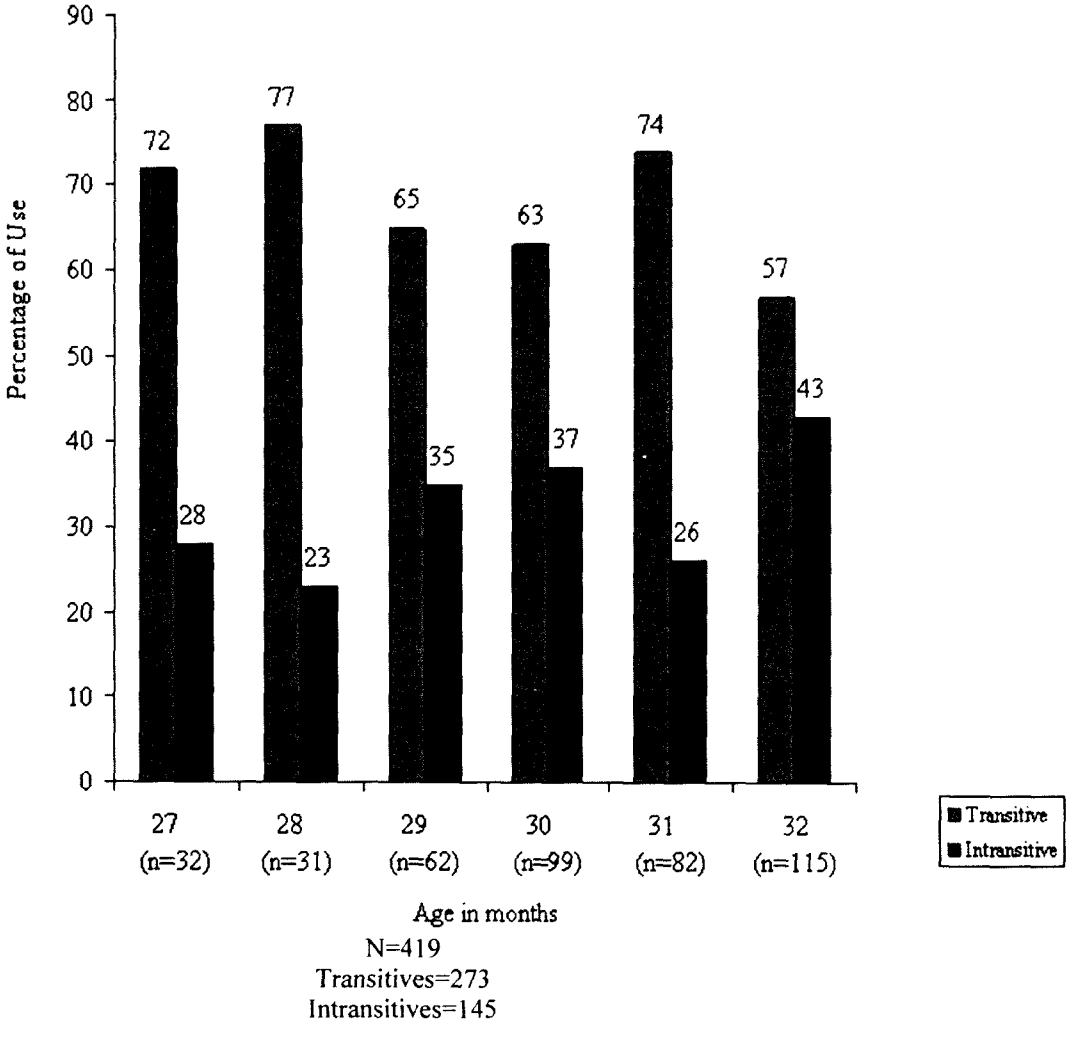
. Tallies were made of all coding within each level and at each time point. Distributional analyses were conducted focusing on patterns of use of the various coding levels as well as their linking with each other. The general aim was to assess whether constructional meaning clusters emerged and if so, how these clusters of form function pairing changed over the course of six months. [36]

3. Results

3.1 *Organization of Form-Function Pairs: Grouped data from each time point*

3.1.1 *Construction type.* The first level of analysis deals with the distribution of transitive (including ditransitives) and intransitive frames in the child's utterances at each time point (see Figure 1) providing a glimpse of the distribution of transitive and intransitive frames over the six month period. While there are more transitive constructions than intransitive constructions at each time point, the child is using a substantial amount of intransitive frames in her interactions. This suggests that the child has some flexibility in the ability to use both constructions and may be using the two different types of constructions to mark different perspectives. [37]

Figure 1. Distribution of construction types by age.



N=419
Transitives=273
Intransitives=145

3.1.1.1 *Analysis at the lexical level.* A central concern with children's early construction use is whether they are able to use the same verb productively by alternating between transitive and intransitive constructions and if so, are they able to use the correct morphological markings with such verbs. For example, if the child is using the transitive form of the verb *khol-* 'open-CAUS.', is she also able to simultaneously use this verb intransitively with the appropriate morphological

changes to create contrasts such as *Dabba khul gayaa* – 'the box opened'? A lexical level analysis adapted from Theakston, Lieven, Pine, and Rowland (2001) was conducted on the child's verb usage at each time point. The analysis comprised of conducting a type frequency of verbs that occurred only in transitive or intransitive constructions and verbs that occurred in both constructions. Table 1 shows the child's use of verbs at each time point on a verb-by-verb basis. [38]

Table 1: Agewise distribution of the number of verb types used in the transitive construction only, intransitive construction only or both constructions.

Time points (age in months	Transitive Only	Intransitive Only	Both Constructions	Total Number of Verbs Used	Mean No. of Tokens per Verb	Proportion of Verbs Used in Both Const-ructions
27	11	4	0	15	2.1	0
28	6	6	1	13	2.3	7.7
29	11	6	3	19	3.2	15.8
30	11	9	5	25	3.5	20
31	11	8	2	21	3.9	9.5
32	15	11	4	30	3.8	13.3

An analysis of verb constructions at each time point showed that from about 28 months of age, the child was using at least two verbs in both transitive and intransitive forms with the appropriate morphological markings on them (see examples 5 to 8). There was also a wide variety of verbs used at the different timepoints; for instance, the verbs that were used in both transitive and intransitive constructions at 30 months were different from those used at 29 or at 31 months (see Appendix). [39]

5. Transitive (28 months)

khol	*diyaa*
open.CAUS	give.sg.msc.perf.

'(I) have opened (it).'

6. Intransitive

khul	*gayaa*
open	go.sg.msc.perf.

'(it) has opened.'

7. Transitive (29 months)

aese	***ban-aa***	*do*
Like.this	form-CAUS	give.Imperative

'(you) make (it) like this.'

8. Intransitive

yeh	***ban***	*gayaa*
this	form	go.sg.msc.perf.

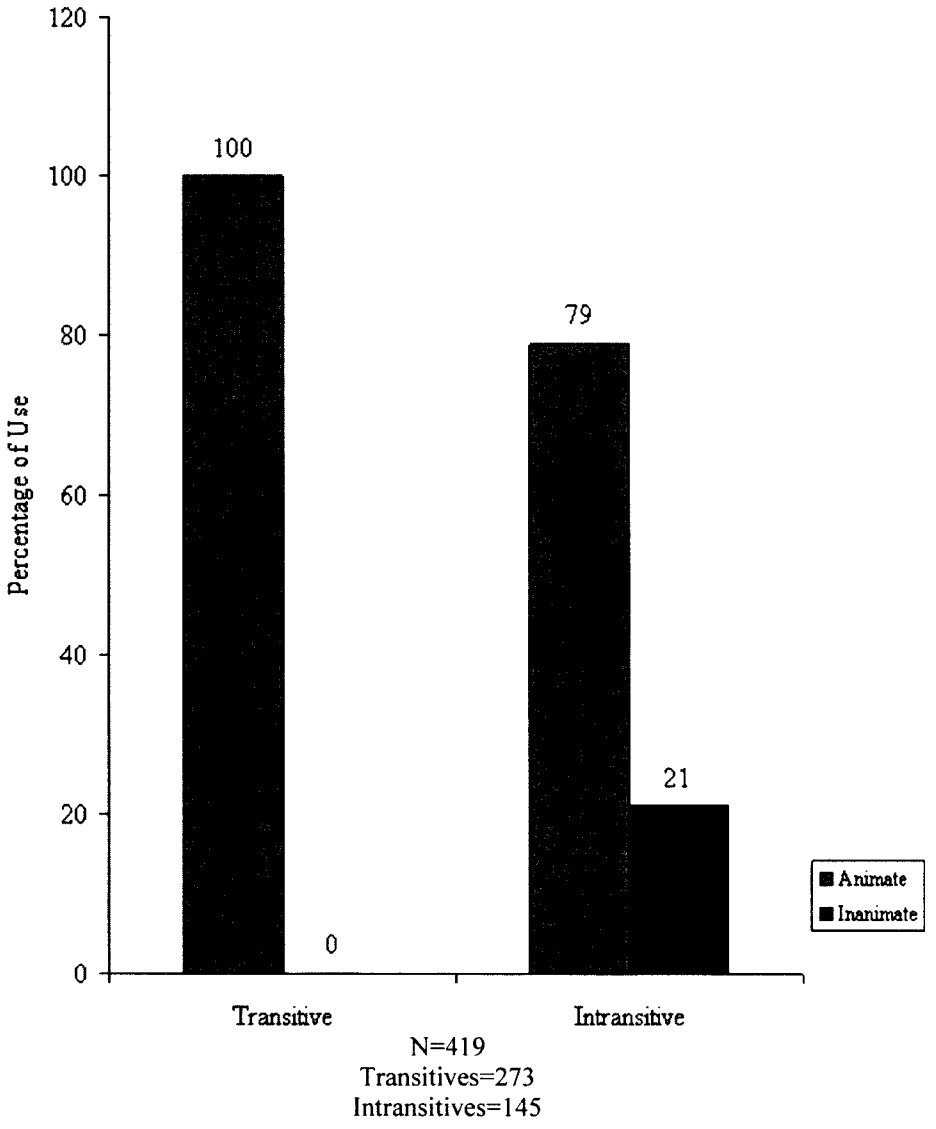
'this is made.'

This suggests that this child was able to alternate between transitive and intransitive constructions with the same verb and indicates some ability to use verbs productively from a very early age. [40]

3.1.2 *Animacy of Arguments.* The second level of analysis examined the distribution of animate and inanimate subjects between transitive and intransitive constructions. The question motivating this analysis concerned whether the child would link transitive and intransitive constructions with a particular semantic category such as agent, actor, or patient subjects. Overall the child used more animate than inanimate subjects in both transitive and intransitive constructions (93% of all verb utterances). While both transitive and intransitive forms were linked with animate subjects, this pattern is stronger for the transitive. We found that all (100%) of the subjects in the child's transitive constructions were animate and a majority (72%) of the objects of transitive constructions was inanimate. That is, it was most typical for the child to say things like *ice-cream khaa lo-* '(you) eat the ice-cream' versus *(mujhe) godii mE le lo* – 'take me in your lap.' The child did not use inanimate subjects at all in the transitive. Thus the child's transitive constructions primarily comprised of an animate subject acting on an inanimate object. The intransitives were used with an animate subject 80% of the time (e.g., *so rahii h|e-* '(she) is sleeping.') However the intransitive was also used with inanimate subjects around 20% of the time

. (see Figure 2), resulting in utterances such as *khul gayaa-* 'It has opened.' [41]

Fig. 2. Animacy of subjects in transitive and intransitive constructions.



From the distribution pattern of animacy of subjects in the transitive and intransitive constructions, there seem to emerge three different types of constructions: (1) a transitive construction with an animate subject, (2) an intransitive construction with an animate subject, and (3) an intransitive frame with an inanimate subject. However, based only on a semantic analysis, it is difficult to assess whether the child is differentiating between transitive and intransitive constructions because she primarily uses animate subjects in both constructions. We now turn to a third level of analysis to examine if the difference between the three types of constructions outlined above lies in the pragmatic function each serves. [42]

3.1.3 *Pragmatic function.*

3.1.3.1 *Difference between animate transitive and intransitive subject constructions.* A third level of analysis examined the distribution of pragmatic functions across transitive and intransitive constructions. The results show that there was a clear distinction in the communicative goals being served by transitive versus intransitive constructions. As can be seen from Table 2, the child was using transitives mostly (73%) as control acts. In contrast, intransitive constructions were used primarily (67%) to make assertions or describe the state of the world. Examples 9 and 10 illustrate the linking of transitive and intransitive frames with control acts and assertion functions respectively. [43]

Table 2: Distribution of Pragmatic Functions between Animate Subject Transitive and Intransitive Constructions

	Control Act	Assertion	Question	Multifunction	Uncodable	Total
Transitive	73% (198)	22% (61)	3% (7)	1% (4)	1% (3)	273
Intransitive	25% (36)	67% (97)	6% (8)	1% (2)	1% (2)	145

9. Transitive animate subject as control act.
(i) Child (30 months) asks researcher to make an elephant out of playdoh.

haathii	*ban-aa*	*do*
Elephant	form-CAUS	give.Imperative

'(you) make an elephant.'

(ii) Child (32 months) asks mother to hold a doll.

pakaD|o
hold.Imperative
'(you) hold (it).'

10. Intransitive animate subject as assertions.
(i) Child (31 months) talks to researcher during doll play

so	*h|e*
rahii	
sleep	be.3.sg.pres.
PROG	

'(she) is sleeping.'

(ii) Child(29 months) talks to mother about a past event of getting hurt, and points at her leg.

meraa	*pipi*	*ho*	*gayaa*[5]. [pipi=child-specific form]
I-Gen	hurt	become	go.sg.msc.perf.

'I got hurt.' [44]

3.1.3.2. *Pragmatic difference between animate and inanimate subject intransitive constructions.* The child constructed two types of construction with the intransitive frame. One construction was an intransitive with animate subject and the other was an intransitive with inanimate subject. An analysis of the pragmatic functions served by each of these two types of constructions showed that broadly, both were linked mostly with assertions and descriptions about the state of the world. However, prior work by Budwig et al. (2001) and Uziel-Karl and Budwig (2003) on children's use of non-agent inanimate subjects suggests that English- and Hebrew-speaking children use various constructions to talk about deviations from a prototypical agent event frame of human causation and that these constructions were linked particularly to report negative events. Based on such work, we conducted a finer grain posthoc analysis of the child's use of intransitive construction. We recoded the intransitive constructions to examine whether the child differentiated between the animate and inanimate subject intransitive constructions by using the latter specifically to report negative effects on patients or to report instances of goal blocking or resistance from the environment as has been found by Budwig et al (2001). Goal blocking was defined by contexts in which the child was manipulating an object to achieve a certain goal but was unable to do so. [45]

We found that compared to animate subject intransitive construction (18%), this child used a higher percentage of inanimate subject intransitive construction (33%) to report negative consequences of self's or other's actions (examples 11 and 12). She also used inanimate subject intransitive construction sometimes to report instances of goal blocking (10%) or ways in which the environment did not cooperate with the child's intentions (examples 13 and 14). On the other hand, the animate intransitive construction was seldom used in such instances (1%), but rather was used primarily for making neutral or positive assertions or descriptions of the state of the world (81%). [46]

11. Child (29, 30 months) accidentally knocks a doll down

Gir	*gayaa*
Fall	go.sg.msc.perf.

'(it) fell down.'

12. Child (30 months) finds that the doll in her hand is broken

TuuT	*gayaa.*
Break	go.sg.msc.perf.

'(it) broke.'

13. Child (30 months) was putting together a puzzle but was unable to fit the piece in its slot.

nahII	*ban rahaa*
Not	form PROG.

'(it) isn't getting made.'

14. Child (30 months) could not open a box

yeh	*khul-tii*	*nahII*	*h|e*
this	open-sg.fem.imperf.	not	be.3.sg.pres.

'It doesn't open.'

This suggests that the child may not be using a general intransitive construction but rather may have two distinct constructions that cluster around semantic and pragmatic factors. [47]

3.1.4. *Functional Intersections.* Integration of the three levels of analysis reported above shows that there is a clear functional cluster in this child's transitive and intransitive constructions (see Table 3). The transitive was used mostly with animate subjects in control acts (73%). The intransitive with animate subject was used to make assertions or describe state of the world. The intransitive with inanimate subject was used mostly to talk about negative consequences of an action and sometimes to report instances of goal blocking from the environment. [48]

Table 3: Distribution of Animate Transitive and Animate and Inanimate Intransitive Subject Constructions across Pragmatic Functions

	Control Act	Assertion	Question	Multifunction	Uncodable	Total
Animate transitive subject	73% (198)	22% (61)	3% (7)	1% (4)	1% (3)	273
Animate intransitive subject	26% (30)	65% (74)	6% (7)	1.5% (2)	1.5% (2)	115
Inanimate intransitive subject	20% (6)	77% (23)	3% (1)	0	0	30

3.2 *Development of Constructions Over Time*

To get a better understanding of how the transitive and intransitive constructions develop over time, an age-wise distributional analysis of these constructions was conducted. That is, the child's productions were re-examined in terms of age-related trends based on the six monthly datapoints. Findings suggest some important developmental changes that are not found in grouped data. For example, although the child used the transitive construction mostly in control related contexts, with time she also started using the transitives to serve declarative purposes to make assertions or describe the state of the world (see Table 4). This suggests an increasing flexibility in the use of these constructions as the same form is gradually endowed with multiple functions. [49]

Table 4: Age Wise Distribution of Transitive Construction Across Pragmatic Functions.

Age (months)	Control Act	Assertion	Question	Multifunction	Uncodable	Total
27	79% (18)	17% (4)	4% (1)	0	0	23
28	68% (15)	27% (6)	5% (1)	0	0	22
29	85% (34)	15% (6)	0	0	0	40
30	74% (46)	18% (11)	2% (1)	3% (2)	3% (2)	62
31	69% (42)	30% (18)	1% (1)	0	0	61
32	66% (43)	25% (16)	5% (3)	3% (2)	1% (1)	65

As noted before, the child used intransitives mainly for declarative purposes throughout the six months. Further distributional analysis over the course of six months indicates that the use of declarative (assertions or descriptions) becomes more prominent with age with still very few intransitive constructions used as control acts. The child reserves the use of transitives for that purpose. However, there is increasing use of questions in intransitive constructions (see Table 5). [50]

Table 5: Age wise Distribution of Intransitive Constructions Across Pragmatic Functions.

Age (months)	Control Act	Assertion	Question	Multifunction	Uncodable	Total
27	56% (5)	44% (4)	0	0	0	9
28	57% (4)	43% (3)	0	0	0	7
29	23% (5)	73% (16)	0	0	4% (1)	22
30	30% (11)	57% (20)	11% (4)	2% (1)	0	36
31	24% (5)	66%`(14)	10% (2)	0	0	21
32	12% (6)	80% (40)	4% (2)	2% (1)	2% (1)	50

We also found a developmental change in the use of the intransitive inanimate construction. Though broadly this construction type was used in declarative contexts, finer grain analyses looking across developmental time revealed that in the initial months, the child used the intransitive inanimate subject mainly to report negative consequences of actions and instances of goal blocking (see discussion above). However, with time, intransitive, inanimate subjects were also used to mark completion of an action for which goal blocking was not an issue (see example 15 and 16):

15. Child (32 months) was pretending to make bread and the researcher asked her when the bread will be made.
ban-egii
form-3.sg.fem.fut.
'(it) will be made.'

16. Child (32 months) finished putting some blocks in a puzzle.
lag *Gayaa*
attach go.sg.msc.perf.
'it has attached.' [51]

Therefore, the findings suggest that hidden in the grouped patterns were not random exceptions, but rather suggest that the deviations from dominant patterns represented a developmental trend. More specifically, the longitudinal case study analysis supports the conclusions that over time, this child is beginning to link each form with multiple functions. [52]

4. Discussion

A central goal of the present study was to examine the nature of a Hindi-acquiring child's early transitive and intransitive constructions from the perspective of the developmental-functionalist approach. Specifically we wanted to account for the types of meaning clusters around semantic and pragmatic factors that are created by this child and the changes in these meaning systems over a period of six months. In the discussion, we will first focus on factors that influence how this child might have come to organize form-function systems the way she did. Furthermore, if we are claiming that the form-function patterns created by this child are a temporary developmental phase en route to the more adult-like systems, a second question can be raised regarding what motivates the child to give up the her child-like linkages. To address this question, we will discuss the potential web of factors that influence the changes in form-function pairings over time. [53]

4.1 *Organization of form-function systems*

Prior work on English-speaking children's syntactic development has shown that children younger than 3 years of age use transitive and intransitive constructions in a restricted manner (Tomasello, 2003). In a lexical analysis of this child's transitive and intransitive constructions, we found that she is flexibly alternating between transitive and intransitive constructions by using at least two verbs as both transitive and intransitive with the appropriate morphological markings

before the age of 3 years. This seems to suggest that this child showed some evidence of moving beyond the item-based phase of verb development. Other crosslinguistic studies have reported similar findings (Berman, 1993; Budwig & Narasimhan, 2004). Budwig and Narasimhan (2004) looked at slightly older Hindi-speaking children (2, 10 to 4, 3 months) and found that around 58% of children in their sample were also using at least one verb in both transitive and intransitive constructions and with both kinds of morphological endings. [54]

Although this child appeared to be beyond the item-based phase of verb development, her use of constructions suggested these were not used in completely abstract, adult-like way. Instead, she tended to link the various constructions to a cluster of semantic and pragmatic meanings. Crosslinguistic research suggests that speakers of various languages organize particular linguistic devices around prototypical notions of agentivity and control (Hopper & Thompson, 1980, Slobin, 1981). The claim is made that the notion of transitivity is best conceived of in terms of a number of related notions cutting across semantic and pragmatic boundaries including such notions as volition, animacy and control. Several separate lines of research provide support for the idea that social control is an underlying organizing function of children's early linguistic forms. For example, Deutsch & Budwig (1989) in their investigation of possessive pronouns found that children employed the pronominal form in their constructions when attempting to gain or maintain control of objects, whereas the nominal form was used when referring to a possession when the possessive relation was not in question. Similarly, slightly older children studied by Shephard (1980) contrastively employed the modal forms *will* and *gonna* based on locus of control. These studies therefore show that children contrastively employ particular forms depending on whether they wanted an action to be carried out by a partner or whether they wanted to bring attention to a particular object.[6] [55]

Drawing from past literature, the present study examined how the notion of social control links with this child's use of transitive and intransitive forms. An examination of the child's meanings systems revealed that this child had created at least three different construction types, each of which served distinct communicative goals for the child. She distinguished between animate subject transitives and animate subject intransitives by pairing each type of construction with different pragmatic functions related to control. For instance, transitive construction linked up with the prototypical scene of marking the actions of an animate agent on an inanimate object and was used mostly as a control act to bring about a change in the interlocutor's actions (see Example 9). On the other hand, the animate subject intransitives were used as assertions or descriptions of the state of the world in which control was not an issue (Example 10). The fact that the child focused her transitives on animate agents replicates findings of many others (Budwig, 1995; Budwig & Narasimhan, 2004; Slobin, 1985). However, the Hindi-speaking children in Budwig and Narasimhan's (2004) sample distributed animate subject transitive use between regulatory and declarative contexts, with a slight preference for the latter. This difference between their findings and ours could be attributed to the ages of children in their sample. Since their sample comprised of slightly older children, it is possible that their constructions were more adult-like and were therefore used in a wider range of contexts. Further work will need to investigate this issue. This linking of linguistic forms with particular semantic factors to serve child's own communicative goals.further lends support to Budwig and Narasimhan's (2004) notion of "interim solution" (p. 14), which are clusters of meaning created by children learning a language en route to adult-like usage. [56]

Along the same line, further examination of child's meaning systems led us to believe that she was not making use of a general intransitive construction but rather had created distinct clusters of meaning around animate subject intransitive and inanimate subject intransitive constructions as well. Post hoc analyses revealed that the child restricted the use of inanimate subject intransitives to report negative consequences of an action on an object or when she faced resistance from the environment to her actions (Examples 11 through 14). Previous studies with English-, German-, Hebrew-, and Hindi-speaking children have shown that even very young children consistently adopt a variety of perspectives with the intransitive construction (Budwig, 2001; Budwig & Narasimhan,2004; Budwig, Stein, & O'Brien, 2001; Smith & Budwig, in press; Uziel-Karl & Budwig, 2003). Inanimate subject intransitives have been shown to be linked with reports of goal blocking (Budwig, Stein, & O'Brien, 2001) by some and in reports of negative consequences by others (Uziel-Karl & Budwig, 2003). The animate intransitive on the other hand, was generally found to be used with neutral or positive events. This further lends support to the idea that children create interim solutions to serve their own communicative needs. [57]

Several accounts can help explain why young children organize form-function systems in a restricted way. Based on a number of empirical and naturalistic studies, Karmiloff-Smith (1979) suggested that initially, small children express and interpret forms unifunctionally, and the choice of a given function depends on the child's capacity to identify the "most consistent input pattern" (p. 237). The frequency and patterns of use of the verbs in the input have been shown to play a critical role what forms are used more by the child by a number of researchers (Berman, 1993; Cameron-Faulkner, Leiven, & Tomasello, 2003; Theakston et al., 2001). Tomasello (2003) has argued that the more frequently a verb is heard in a particular construction, "the more firmly its usage is entrenched" (p.178); that is, children are less likely to extend that verb to any novel construction with which they have not heard it used. Relating this idea to the present study, it is possible

that the child in this study hears transitive constructions in the input mostly in contexts in which the speaker is trying to change the interlocutor's actions and therefore uses this construction more frequently than any other. However this does not imply that the children merely copy the forms they hear in input. Language learning is rooted in very general cognitive abilities to seek and organize patterns in the environment (Karmiloff-Smith, 1979; Tomasello, 2003). The child makes use of these general cognitive abilities of analogy and pattern finding to isolate the *dominant patterns* in the input. For instance, Budwig (1995, 1996) found that while all of the caregivers in her study tended to use *I* in a functional cluster similar to that used by the children, none of the caregivers restricted the use of particular self-reference forms to a specific semantic and pragmatic cluster. It would be important in the future to examine the relation between form-function pairing in the input and this child's constructions to determine the relationship between the two. [58]

A second factor that has been shown to impact the sort of form-function systems children construct is related to the particular structural properties of the language being acquired. The extent to which particular language categorized meaning plays a role in child's categorization. Bowerman (1985) suggested that children are sensitive to the clues from the language they are acquiring. The findings from the present study suggest that this child demonstrates more flexibility in using both transitive and intransitive constructions than has been reported for English-speaking children. Some languages like Hebrew and Hindi have distinct markings on transitive and intransitive forms of the verb. It is possible that these markings make the different forms of the verbs more salient to a young child and therefore the child learns the use of the appropriate form earlier. Typological factors may also explain the differences in the kinds of meaning that this child constructs around transitive and intransitive constructions. The child always used the transitive constructions with an animate subject in control acts of regulating self or others actions. In certain contexts the child used an inanimate intransitive construction. These were generally instances when the child was describing a negative consequence of an action such as *it broke* for a broken toy the child picked up. In Hindi, the use of an active transitive with animate subject implies intentionality. The distinction between a transitive and intransitive form marks the difference between deliberate and non-deliberate action respectively (Snell, as cited in Budwig & Narasimhan, 2004). A child acquiring Hindi may therefore become sensitive to and make these distinctions earlier in her constructions because the Hindi language overtly marks these with morphosyntactic means. This argument supports conclusions drawn by those who study Hebrew-speaking children (see Berman, 1993; Uziel-Karl & Budwig, 2003). [59]

4.2 *Developmental changes in form-function organization*

The developmental-functionalist approach views development in terms of the changes in form-function patterning over time. Budwig (1995) claimed that children move developmentally from a phase of using multiple forms, each linked with distinct meanings and used in a context restricted way, to one of using the forms multifunctionally as adults do. The most salient feature of the present study was a similar trend of changes in the form-functioning patterns. There was a systematic developmental change in the use of the constructions in a relatively small window of six months. For example, the transitive construction was initially used as a control act aiming to bring about a change in the child's or the interlocutor's actions. For instance, when the child wants the mother to pretend to eat ice cream made of blocks and says: *ice cream khaa lo* – 'eat the ice cream.' But over time, the child also started linking the transitive form with the function of assertions about the state of the world. The example below is from an instance when the child was describing to the researcher that she got hurt and cried. The researcher asked her what happened next. The child responded with the following utterance:

17. Child (32 months)

aese	*fir*	*mummy*	*toffee*	*laa-yii*	*thii*
like.this	then	mummy	toffee	bring-sg.fem.perf.	be.sg.fem.perf.

like this, mother brought toffee

In the above example, the child was simply describing a past event (using a transitive construction) with no attempt to change the researcher's actions in anyway. Earlier the child tended to use intransitives for this function. [60]

A similar process of movement from context-restricted use of forms to a more multifunctional use of forms was also evident in this child's use of intransitive with inanimate subject. This construction was initially differentiated from an intransitive with animate subject by using it only to report instances of goal blocking and negative consequences of action, while the intransitive with animate subject was used to make assertions or describe the state of the world in general without any negative connotations. However, over time, the child broadened the scope of the intransitive inanimate construction by using it more in non-negative instances, such as reporting completion of an action. We turn now to various accounts that might help explain why children give up their original systems in favor of adult-like systems in which forms are used multifunctionally. [61]

This movement from a phase of using multiple forms each with a distinct function to a phase of using forms multifunctionally can be interpreted in the light of a cognitive account proposed by Karmiloff-Smith (1979). According to her theory, at first children link each form with one function by recognizing examples of the function presenting the most consistent pattern in the input. In most cases, there are examples of other functions served by the same forms, but these might be exceptions to the general patterns found in the input. According to Karmiloff-Smith, once the child is aware of one form fulfilling two different functions, there is a tendency to "create temporarily a new form to cover one of the two functions" (p. 239). This way the original form is retained for the other function. A similar process seems to be occurring in our data, the child in the present study uses two different forms of the intransitive construction, linking them with two different functions. It may be that initially the child becomes aware that the intransitive is fulfilling the function of reporting both the neutral as well as negative consequences of an action on an object. She might then have created a separate form of an intransitive inanimate subject construction to cover the function of describing something negative about the state of the world. It is suggested that this differentiation by creating different forms helps the child consolidate two separate meanings normally expressed by a single form in adult usage. Once this consolidation has taken place, the child then drops or integrates the forms to use for the expression of both functions. Thus gradually the child integrates the relations between functions and uses forms multifunctionally the way adults do (Budwig, 1995; Karmiloff-Smith, 1979). [62]

Several hypotheses exist regarding what might lead children to reorganize their form-function systems towards a more adult-like usage. It has been suggested that caregivers pull for certain types of form-function patterns by providing discourse pressure or that adults might scaffold the child's use of particular constructions (Budwig & Narasimhan, 2004). Another account that has gained increasing importance in explaining the shift in form-function patterns deals with such issues as the impact of the speaker's belief systems and attitudes on the organization of form-function patterns in ongoing discourse (Schieffelin & Ochs, 1986). Thus, a change in form-function patterns could be linked to developmental changes in children's beliefs about themselves, their communicative partners, and the function of the communicative context (Budwig, 1996). Still others have proposed that the patterning is initially affected by parental input and then proceeds on the basis of experience with individual verbs (Uziel-Karl, 2002). However the findings are still vague regarding the specific mechanisms guiding the reorganizing process. Future research should examine this issue more carefully. [63]

Taken together, these findings suggest that after a phase of linguistically marking various functions with distinct forms, the child is said to "gain control over the organization of the relation between form and function" (Budwig, 1995, p. 196). Once this phase of organization is reached, the child no longer externalizes the distinction between various functions, but rather she begins to encode in a single form a cluster of related meanings and functions that were previously encoded in several separate forms. This account further strengthens a central claim of the developmental-functionalists that children pay attention to meaning during construction use, particularly in terms of how they choose to situate the self and other, as well as their agentive roles in light of communicative demands. Moreover, the developmental change is motivated by a web of interrelated factors. Thus, one must consider not only the factors external to the child such as the nature of input, but also the child's changing notions of human action, communication, and language as a system in uncovering the mechanisms that guide the relationship between form-function pairs. [64]

Finally we would like to highlight the importance of contextualizing the present study as a case study method. Case studies can be the crucible for more advanced theoretical analysis. Indeed, extending David B. Miller's (1977) comments about naturalistic observation to case studies of children learning language, the case study plays a critical role as early steps in theory building and testing. Therefore, contextualizing the present study within the case study approach served as a starting point for investigating the notion of interim solutions in a language different than English. It helped to validate the findings of functionalists who view development in terms of changes in form–function patterning. Since many studies have shown that there is a difference between the grammar of language as described by linguists and the actual language children hear and use (Budwig & Narasimhan,2004; Cameron-Faulkner, Leiven, & Tomasello, 2003; see also Tomasello, 2003), using a case study method helped us explore longitudinally and in depth the process underlying children's acquisition of abstract, adult-like constructions. Furthermore, the findings from this study will serve as a point of departure from which to develop an experimental program for controlled research. We conclude by quoting Slobin (1985) that "one cannot study universals without exploring particulars" (p. 4). Therefore, it is only by examining both that is universal and that is particular to each culture and each language that we can begin to discern why there are differences in the pattern of acquisition of different languages. [65]

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Footnotes

[1]Uziel-Karl & Budwig's (2003) use of middle constructions is similar to Berman's (1993) use of the intransitive inchoative construction. Both authors refer to utterances with a patient perspective referring to actions that have negative outcomes.

[2]Not all transitive verbs in Hindi have a clearly morphologically related intransitive (inchoative) counterpart (e.g. *khaa* 'eat'), and not all intransitive verbs have a clearly morphologically related a causative counterpart (e.g. *mil* 'receive'). Nevertheless, there is a fairly productive process of causativization of intransitive inchoative verbs involving the suffix *–aa* (e.g. *ban* 'form'—*ban-**aa*** 'form-CAUS/make'; *gir* 'fall'—*gir-**aa*** 'fall-CAUS'). Another clear indication of transitivity in Hindi is the ubiquitous light verb that accompanies the main verb: typically the light verbs *le/de* 'take/give' are used with (di-)transitive verbs and *jaa* 'go' with intransitive verbs (e.g. *khaa lo* 'eat take.imperative' versus *khul gayaa* 'open go.sg.msc.perf.).

[3] Glosses: Erg: Ergative; Nom: Nominative; Acc: Accusative; Dat: Dative; Gen: Genitive; Loc: Locative; Ins: Instrumental; NF: Non-finite verb; Pst: Past tense; Pres: Present tense; Fut: Future tense; Prog: Progressive; Sg: Singular; Msc: Masculine; Fem: Feminine; Hab: Habitual; Perf: Perfect*ive*; Inch: Inchoative; Caus: Causative

[4] This study is part of ongoing research in the SCLD LIPS lab under Dr. Nancy Budwig at Clark University. She looks at particular acquisition problems faced in acquiring typologically different languages like English, German, and Hindi. More details on ongoing projects can be found at http://www.clarku.edu/faculty/nbudwig/research.html

[5] *pipi ho jaa* was treated as a complex unanalyzed whole verb.

[6] One of the reviewers has pointed out that there are other ways of understanding function outside the control/non-control framework related to interpersonal dynamics. The authors agree with this comment however, the view of function used in this paper is tied to prior work on transitivity in child language and further analysis of this lies outside the scope of the current paper but would be an interesting study for future work.

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APPENDIX: Agewise distribution of verbs in transitive construction only, intransitive construction only and both constructions.

Age (months)	Transitive only (including ditransitives)	Intransitive only	Both (transitive and intransitve)
27	le 'take' (2) bataa 'tell' (1) banaa 'make' (4) khaa 'eat' (7) de 'give' (2) toD| 'break' (1) khol 'open' (2) kar 'do' (1) choD| 'leave' (1) kaT 'cut' (1) pii 'drink' (1)	baiTh 'sit' (2) so 'sleep' (3) uD| 'fly' (1) gir 'fall' (3)	0
28	kar 'do' (5) Daal 'put' (1) Khaa 'eat' (10) pehen 'wear' (1) dekh 'see' (2) banaa 'make' (1)	aa 'come' (1) so 'sleep' (1) ro 'cry' (1) kuud 'jump' (1) nahaa 'bathe' (1) ruk 'stop' (1)	khol 'open' (4)
29	khaa 'eat' (7) bataa 'tell' (1) de 'give' (3) jhuul 'turn around' (1) daal 'put inside' (1) nikaal 'remove' (2) le 'take' (1) khol 'open' (2) rakh 'put' (1)	gir 'fall' (5) jaa 'go' (2) pipi ho jaa 'got hurt' (2) so 'sleep' (1) ghuumnaa 'travel' (1)	kar 'do' (15) ban 'make' (2) dekh 'see' (10)
30	khaa 'eat' (3) le 'take' (3) do 'give' (14) dekh 'see' (6)	aa 'come' (4) so 'sleep' (2) mar 'die' (1) gir 'fall' (5)	kar 'do' (16) toD| 'break' (5) ban 'make' (5)

	fenk 'throw' (2) bulaa 'call' (1) pakaD| 'hold/catch' (1) nikaal 'remove' (1) pii "drink' (1) daal 'put inside' (2) ghumaa 'turn around' (1)	jaa 'go' (3) ruk 'stop' (1) baith 'sit' (1) haT 'move' (1) utarnaa 'taken down' (1)	khol 'open' (5) kaaT 'cut' (2)
31	dekh 'see' (13) khol 'open (11) pehen 'wear' (2) le 'take' (2) bajaanaa 'play instrument' (1) de 'give' (10) toD| 'break' (1) daal 'put inside' (3) nikaal 'remove' (2) pakaD| 'hold/catch' (1) rakh 'put' (1)	so 'sleep' (1) chup ho 'keep quiet' (1) khel 'play' (2) gir 'fall' (1) bhaag 'run' (1) baiTh 'sit' (4) aa 'come' (3) jaa 'go' (3)	kar 'do' (10) khaa 'eat' (8)
32	khol 'open' (3) jhuul 'turn around' (2) pakaD| 'hold/catch' (2) Daal 'put inside' (7) de 'give' (1) laa 'bring' (4) maar 'hit' (1) kaaT 'cut' (1) pii 'drink' (1) rakh 'put' (3) pehen 'wear' (1) faaD| 'tear' (1) dekh 'see' (10) haT 'move' (2) bacaao 'save' (1)	aa 'come' (8) gaa 'sing' (1) ghuumnaa 'travel' (1) gir 'fall' (2) pipi ho 'hurt' (1) baiTh 'sit' (1) bol 'speak' (1) jaa 'go' (5) chaD| 'climb' (1) ro 'cry' (7) so 'sleep' (1)	kar 'do' (20) ban 'make' (2) khaa 'eat' (8) lagaa 'attach' (14)