

EXPLAINING CHILDREN'S ACQUISITION OF CAUSATIVE
CONSTRUCTIONS: A CRITIQUE OF THE GRAMMATICALLY
RELEVANT SUBSYSTEM HYPOTHESIS (PINKER, 1989)

Janna B. Oetting

University of Kansas

The purpose of this paper is to evaluate Steven Pinker's (1989) Grammatically Relevant Subsystem Hypothesis in its ability to account for children's acquisition of causative constructions. This paper is divided into three sections. First, I briefly outline Pinker's model, highlighting the predictions it makes for acquisition. Second, I re-analyze the limited but telling acquisition data Pinker uses to support his theoretical approach. Finally, I examine the results of a recent study which focuses on children and adults' productive tendencies to overgeneralize noncausative and causative expressions during a task-oriented experiment (Braine, Brody, Fisch, Weisberger, & Bloom, 1990).

In English, and in most other languages (cf. Guerssel, Hale, Laughren, Levin & Eagle, 1985), there are a variety of ways to express causation. Given the event description in 1a, the most direct method is to move the theme of the sentence to the object position, adding an extrinsic agent to the subject position. This direct causative alternation is illustrated in 1b. Interestingly, not all verbs in English can express causation in this manner. Therefore, English allows two additional methods, the use of suppletive verb pairs, shown in 1c-1d, and the use of periphrastic causatives, shown in 1e-1f.

1a The glass broke.

1b Mary broke the glass.

1c The baby giggled.

1d Mary tickled the baby.

1e The baby cried.

1f Mary made the baby cry.

The learnability problem for acquisition is to explain how children come to know which verbs take which syntactic forms. Specifically, a child

must learn which verbs have privilege to the direct causative alternation. Acquisition of suppletive pairs are less in need of explanation because children can learn the unknown counterpart through positive evidence. That is, a child who uses the verb fell incorrectly in causative sentences (e.g. Kim fell the glass) may correct these errors over time after hearing the correct verb drop in the input. Likewise, children's learning of periphrastic constructions does not need an elaborate acquisition model because all verbs in the English language can be expressed periphrastically. Consequently, children can rely on positive evidence in the input for acquisition. Therefore, Pinker's ability to account for how children learn which verbs take the direct causative alternation is central to his model.

Following Jackendoff (1983), Pinker suggests that syntactically relevant meaning distinctions within and across languages hinge on a small number of recurring privileged semantic elements. Although he outlines a variety of different types of semantic elements, three help set the criteria children use to learn direct causative constructions: conceptual constituents, functions, and properties. Examples of these are listed in 2a- 2c:

2a Conceptual Constituents: act, thing, event, place, path

2b Functions: +/-dynamic, +/-control

2c Properties: +/-animate, +/-human

Pinker combines these different elements to make a broad range rule and narrow range criteria to restrict the types of verbs allowing direct causative expressions. By doing this, his model has two different levels of semantic criteria governing syntax. His claims are twofold. First, these elements, which are based on subtle semantic features rather than perception or cognition, are salient to adult language users. Second, the task children face when learning causative expressions is to figure out how syntax is organized around the different semantic criteria. Pinker's broad based rule is stated in 3a.

3a X acts on Y

As shown in 3b, the broad based rule bifurcates all English verbs into two large classes. Thus, verb meanings entailing have, own and possess are separated from a large class of activity verbs.

3b	<u>Activity Class</u>	<u>State Class</u>
	You cried her.	Would you like me to have you some. It always sweats me.

Because all of the verbs permitted by the broad based rule do not undergo the direct causative alternation, Pinker's model utilizes narrow range criteria to further split the activity verbs into smaller categories. Four classes of verbs allow the causative alternation and four do not. These are shown in 4a- 4b.

4a Classes taking the causative alternation

Change of State: open, close, melt, shatter, shrink
 Contained Motion: slid, skid, float, roll, bounce
 Manner of Locomotion: walk, gallop, trot, race, ran,
 jump, march
 Accompanied Transportation: drive, fly, cycle, ferry,
 sail

4b Classes not taking the causative alternation

Direct Motion: went, came
 Change of Existence: disappear, appear, vanish
 Human Action: eat, drink, cry
 Verbs of Emission: glowed, howled, sing

Pinker's model makes the following predictions. Initially, a child should begin to produce causative constructions with a few verbs. These early productions occur because of conservative learning rather than the child's productive use of semantic criteria. After a child begins to produce causative constructions, the broad range rule begins to crystallize or develop. Pinker claims that the broad based rule should develop when children are around the age of two. At this point, a child should begin to produce errors or overgeneralizations. Given that the child, during this early stage of language learning has at her disposal only the broad range rule, errors should occur with activity verbs only. This means that children should make causative errors with verbs like bash, hit, cut, laugh, cry, and sadden, but not errors involving state verbs because they lack action.

Through conservative learning the criteria for each narrow verb class must be learned. Pinker makes no predictions as to the exact age at which

narrow classes develop, nor to which narrow class develops first. The model, however, in order for it to account for children's robust abilities to learn syntax, implies that the classes come in rather quickly, once one verb in the class is learned. Otherwise, a model which requires a child to conservatively learn each word in a verb class before the narrow range criteria can be set, is not going to be very powerful. Therefore, the model must assert that the different criteria are quickly and efficiently mastered by children.

The model also predicts that children's errors will be bidirectional. That is, until a child masters all of the narrow range criteria, the child should incorrectly use verbs in anticausative as well as causative constructions. Finally, a third prediction the model makes is that older children and adults should be able to use the broad and narrow range semantic criteria when adding new words to their grammars. Thus, an adult who hears a nonce word should know if the verb can undergo the causative alternation, simply by analyzing a verb's semantic features.

Re-analysis of Pinker's Data

To support his model, Pinker relies mainly on causative errors children have been documented to make. His causative errors come from children who range in age from 2;1 to 11 years. These data have been gathered from a variety of sources which range from systematically collected diary studies (Brown, 1974; Bowerman, 1974) to informal reports from colleagues.

When the child data are analyzed according to Pinker's broad and narrow range criteria, all of the examples do not yield convincing evidence that Pinker has explained the learnability problem accurately, nor that his model adequately accounts for development. Of the 78 causative errors reported (pp. 23-25), 21% are not really violations of either the broad or narrow range criteria. Rather the children's utterances are ungrammatical because they include infelicitous noun-verb combinations. Some examples of these types of errors are found in 5a-5d.

	<u>Verb</u>	<u>Age</u>	<u>Reported Utterance</u>
5a	Take	2;6	Take me a doughnut.
5b	Drink	3;1	Drink me...
5c	Spell	4;6	Spell it "buy".
5d	Sing	2;11	... watch the mans sing their guitars.

Take for example the utterance in 5a. The child's utterance is in accordance with both the broad and narrow range criteria. It is ungrammatical because the object me violates the deictic function of the take/bring pair. One can say, 'Take John a doughnut', but not, 'Take me a doughnut'. Pinker's model does not suggest that children make these types of errors, nor does it provide an explanation for how children correct these utterances.

Similarly, an additional 29% percent of the errors reported by Pinker are due to suppletive substitutions. If a child's correction of suppletive substitutions can be explained by positive evidence, as Pinker suggests, then the model need not explain these types of utterances. At the same time, a model which accounts for only half of the problems children face when learning a particular syntactic structure loses power in its ability to account for the acquisition issue at hand.

Of the remaining child errors most of them follow Pinker's predictions. These errors, some of which are shown in 6a-6k, include children's incorrect usage of activity verbs in causative constructions. These errors in young children are accurately predicted by Pinker's model insofar as the utterances abide by the broad range rule but violate his narrow range criteria.

	<u>Verb</u>	<u>Age</u>	<u>Reported Utterance</u>
6a	Vanish	7;8	Did they vanish knock knock cups [noticing dixie cups in the new pack without jokes on the sides.
6b	Sweat	4;3	It always sweats me.
6c	Wish	3;6	These are nice beds. Enough to wish me that I had one of those beds.
6d	Ache	4;1	You ached me.
6e	Go	2;9	You go it in.
6f	Disappear	6+	Do you want to see us disappear our heads.
6g	Talk	2;2	I'm talking my birdie
6h	Cry	5;3	You cried her.
6i	Drink	3;1	Drink me [asking for an orange to be squeezed in mouth]
6j	Sounds	6+	It sounds you like a mouse.
6k	Sing	3;1	I'm singing him.

In addition to these errors, however, are causative errors involving be and have, and other state verbs such as feel. These errors, some of which are listed in 7a-7c, are particularly embarrassing for Pinker's model because they violate the broad range rule. Errors with state verbs would not be detrimental to his theory if they occurred in children's speech at the commencement of

children's frequent overgeneralizations. Unfortunately, children as old as five years of age are reported to produce these types of errors.

	<u>Verb</u>	<u>Age</u>	<u>Reported Utterance</u>
8a	Be	5;0	Be a hand up your nose.
8b	Have	4;6	Would you like me to have you some.
8c	Feel	2;3	Bottle feel my feets better.

Therefore, in evaluation of Pinker's developmental predictions, the data he uses to support his claims suggest that his model accounts for only a portion of the errors children make. Consequently, the model only acknowledges about a half of the problems children face when they are learning how different verbs work in grammar. Furthermore, the patterns of children's errors do not always follow developmental predictions inherent to the learning of Pinker's broad and narrow range criteria. Either the broad based rule does not crystallize until a child is much older than Pinker asserts, or children and possibly adults do not adhere to the semantic elements that make up his criteria.

In regard to the bidirectional prediction, the children's errors are only unidirectional; causative errors are frequent while anticausative errors are obsolete. This finding may not be a weakness of Pinker's model directly. Anticausative errors such as paper cut or letter write, in reference to someone cutting paper or writing a letter, are difficult to detect in children's speech (Bowerman, 1974; Maratsos, Gerard-Ngo, Gudeman, & DeHart, 1987). Thus, the errors Pinker presents, although they do not refute the bidirectional prediction, do not provide evidence in its support. Finally, his third prediction, that the syntax of older children and adults is governed by semantic criteria, cannot be tested by the data he provides; diary studies often stop after children reach the school age years.

Analysis of a Recent Experimental Study

Braine, et al. (1990) examined children and adult's productive tendencies to overgeneralize noncausative and causative constructions when presented familiar and nonce words. Although the concern of their study was not to test Pinker's model directly, the results can be used to evaluate some of Pinker's predictions. Braine et al. presented children between the ages of 3 and 5;6 years and adults of college age, thirteen verbs with actions. Seven of the verbs were familiar to the subjects (i.e., dance, bounce, fall, turn, throw, roll, put). Half of these verbs are intransitive noncausatives and the other half

surface in transitive causative expressions.

Six additional nonce verbs were also presented to the subjects. Half of these denoted enduring actions and the other half depicted static movement. The nonce verbs were presented to the subjects in either intransitive noncausatives or transitive causatives syntactic frames. The basic procedure of Brain et al. was to introduce a verb to a subject while demonstrating its action with toys. The examiner then had the child or adult act out the action. This was followed by the examiner asking the subject questions about the patient or agent of the activity. The intent of Brain et al. was to see if children and adults overgeneralize familiar and nonce verbs to elicited syntactic frames. Thus, their study yields data to test Pinker's bidirectional prediction as well as some of his claims concerning language development.

Results from Braine et al. indicated that children frequently overgeneralized familiar verbs, and their overgeneralizations were bidirectional. In contrast, adults did not overgeneralize familiar verbs. Both of these findings support Pinker's claims that the task of causative acquisition is bidirectional, and that adults have the ability to restrict their productive tendencies when the semantic features of a verb is understood.

When the nonce verbs were presented both children and adults overgeneralized. This finding is particularly interesting given that the adults' overgeneralizations were heavily influenced by the syntactic frame used to initially introduce the verb to them. In contrast, children's responses were not influenced by the presented syntax. This finding suggests that speakers of a language improve their ability to figure out a verb's argument structure by the syntax presented to them. This is not Pinker's claim, however. Pinker attests that the syntax of adults is governed by semantic criteria embodied within the meanings of verbs. If the adults in Braine et al.'s study were sensitive to the semantic criteria of the nonce verbs, their responses would not have been highly influenced by the syntax presented. Rather responses would have been dependent on the actions represented by the novel verbs.

Therefore, Pinker's third prediction and perhaps the claim driving his acquisition model, is not upheld. Adults do not seem extremely sensitive to semantic criteria void of syntax. Thus, in order for a language to have the types of grammatically relevant semantic criteria Pinker discusses, syntax appears needed for its establishment. More importantly, in order for speakers of a language to pick up on grammatically relevant semantic criteria, syntax must be exploited. Consequently, this finding directly refutes Pinker's claims that syntax is driven by semantic features within the lexicon.

In conclusion, I have identified three predictions Pinker's (1989) Grammatically Relevant Subsystem Hypothesis makes: 1) that children acquire the causative alternation via the learning of broad and narrow range criteria, 2) that the learning task at hand is bidirectional, and 3) that syntax is governed by a verb's semantic features. Only the second prediction was upheld. In regards to the first and third predictions of the model, Pinker not only fails to account for developmental patterns of children's errors, his description of the language learning task appears inadequate. A child, first learning language, has a number of syntactic/semantic issues to marshal before she can correctly generalize a newly learned verb to additional syntactic expressions. Some of the problems facing the child include figuring out which nouns can be combined with which verbs, and which suppletive counterparts go with which argument structures. Moreover, the results from Braine et al. suggest that the role of syntax cannot be ignored in an acquisition model no matter how semantically based a model purports to be.

Acknowledgements

This paper was presented while the author was a U.S. Department of Education trainee, Grant #H029D90046-90.

References

- Bowerman, M. 1974. Learning the structure of causative verbs: A study in the relationship of cognitive, semantic and syntactic development. Papers and reports on child language development. Department of Linguistics, Stanford University. 142-178.
- Braine, M., Brody, R., Fisch, S., Weisberger, M., & Blum, M. 1990. Can children use a verb without exposure to its argument structure. *Journal of Child Language*, 17. 313-342.
- Brown, R. 1974. *A first language*. Cambridge, MA: Harvard University Press.
- Guerssel, M., Hale, K., Laughren, M., Levin, & Eagle, J. 1985. A cross-linguistic study of transitivity alternations. *Chicago Linguistic Society*. University of Chicago, 21. 48-63.
- Jackendoff, R. 1983. *Semantics and cognition*. Cambridge: The MIT Press.
- Maratsos, M. Gerard-Ngo, P., Gudeman, R., & DeHart, G. 1987. Mechanisms of language acquisition, ed. by B. MacWhinney, 89-113. New Jersey: Lawrence Erlbaum Associates.
- Pinker, S. 1989. *Learnability and cognition: The acquisition of argument structure*. Cambridge, MA: The MIT Press.