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NO NEGATIVE EVIDENCE? BROWN AND HANLON REINTERPRETED

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Abstract
This paper re-examines Brown and Hanlon's 1970 study, on which the 'no negative evidence' hypothesis is based, and suggests that the discourse analysis methodology used was fundamentally flawed. This meant that a) some of their actual findings were not reported b) they were unable to locate examples of negative evidence which are present in their own raw data c) subsequent researchers came to the flawed conclusion that Brown and Hanlon had proved that parents did not supply corrective feedback or negative evidence to their children.

A reanalysis of a small proportion of Brown and Hanlon's raw data (transcripts) using a Conversation Analysis methodology finds clear examples of negative evidence supplied by adults and utilised by children. The study also considers how adults respond to ungrammatical utterances by children and why they do so.

Key words
First language learning, language development, discourse analysis, conversation analysis, negative evidence.

Resumen
El presente articulo re-examina el estudio de Brown y Hanlon en 1970, en el que se basa la hipotesis de la evidencia no negativa, y sugiere que la metodologia del analisis conversacional que se usó fue fundamentalmente imperfecta. Esto significa que a) algunos de los resultados reales no se reportaron; b) los autores fueron incapaces de ubicar ejemplos de evidencia negativa los cuales se encuentran en la informacion recolectada y c) investigadores posteriores llegaron a la conclusión errónea de que

This article reports on a theoretical discussion about ´no negative evidence´ hypothesis. It supports the major researchs field of ´FL Teaching and Learning´ of the UPTC Master Program in ´FL Teaching´.

Brown y Hanlon habian probado que los padres no suministraron retroalimentación correctiva o evidencia negativa a sus hijos.

El re-análisis de una pequeña cantidad de la información primaria de Brown y Hanlon (transcripciones) utilizando la metodología de análisis conversacional, muestra ejemplos claros de evidencia negativa provista por los adultos y usada por los niños. Este estudio también considera cómo los adultos responden a las construcciones no-gramaticales de los niños y explica por qué lo hacen.

Palabras clave:
Aprendizaje de la lengua, desarrollo de la lengua, análisis del discurso, análisis conversacional, evidencia negativa.

A brief history of the 'no negative evidence' hypothesis

Brown and Hanlon's classic 1970 study 'Derivational Complexity and Order of Acquisition in Child Speech' marks the starting point and very foundation of the 'no negative evidence' hypothesis. Their significant conclusions, in terms of the 'no negative evidence' hypothesis[i], were that:

> "In neither case is there even a shred of evidence that approval and disapproval are contingent on syntactic correctness." (Brown and Hanlon, 1970, p. 47)
> "Explicit approval or disapproval of either syntax or morphology is extremely rare in our records and so seems not to be the force propelling the child from immature to mature forms." (Brown and Hanlon, 1970, p. 48)

As Sokolov and Snow (1994, p. 40) put it, after Brown and Hanlon "It was thus generally accepted that…. Children do not receive explicit negative feedback from their parents." Marcus (1993, p.54) states that: "*Based largely on their conclusions*, (my italics) much subsequent research in language acquisition has tried to solve the puzzle of how children acquire language solely from positive evidence and without negative evidence." During the 1980s a number of 'discourse studies' (Bohannon & Stanowicz 1988: Demetras, Post & Snow 1986: Hirsh-Pasek, Treiman & Schneiderman 1984) suggested that parents provide implicit feedback to their children in relation to grammatical correctness. Their findings were disputed by Marcus (1993).

A number of recent research studies, which are discussed in a later section, suggest that parents do supply corrective feedback which is taken up by children. The debate is currently rather polarised, with negative evidence seen as "a central issue dividing accounts of language acquisition." (Strapp, 1999, p. 373). A number of recently published works are firmly in the 'no negative evidence' camp. Crain and Lillo-Martin (1999, p.11), for example, present Brown and Hanlon (1970) as "evidence against corrective feedback as a major contributing factor in language development" and in fact this is the only study which they cite as evidence.

[i] This study relates to pp 41-52 of Brown and Hanlon (1970).

Similarly, Crain and Thornton (1998, p.283) state that "Constraints are negative statements. It is safe to assume that not all children, perhaps no children, encounter evidence pertaining to constraints." It seems that much future language acquisition research is likely to be based on the foundations of the 'no negative evidence' hypothesis, which is in turn based on Brown and Hanlon. For example, Schwartz and Sprouse (2000, p.131) call for a return to basics by giving due respect to the argument for Universal Grammar from the underdetermination problem, noting that "…there are no data that can serve as the basis for inducing knowledge of ungrammaticality." (2000, p.124)

Now would seem to be an appropriate time to re-examine the robustness of Brown and Hanlon's 1970 study for two reasons. In the 'no negative evidence' camp, so much research now rests almost exclusively on the foundations of Brown and Hanlon's thirty-year old study that it is necessary to be quite clear that the foundations are secure. In the 'negative evidence does exist' camp, there have been a number of research studies providing new evidence. However, none have revisited Brown and Hanlon's discourse analysis methodology in detail[ii].

Although it was not recognised as such at the time, Brown and Hanlon (1970) can be seen as one of the first published works of discourse analysis of naturalistic recorded spoken data, predating Sinclair and Coulthard's (1975) seminal text. Brown and Hanlon is fundamentally a discourse analysis study in that it searches transcripts of naturally occurring conversation for particular linguistic features. This paper will first examine their discourse analysis methodology and consider how the methodology may have influenced their findings. Then I will reanalyse a sample of their raw data using a Conversation Analysis (CA) methodology (Levinson, 1983) and will reach very different conclusions. What methodology did Brown and Hanlon use to conduct the search through their data which was to result in the 'no negative evidence' hypothesis?

> "We first listed all of those exchanges in which a parent responded with such signs of approval as That's right, Correct, Very good, and such signs of disapproval as *That's wrong* or *That's not right* or *No*." ……The general plan, of course, was to contrast the syntactic correctness of the population of utterances followed by a sign of approval with the population followed by a sign of disapproval." (1970, p.47)

The fundamental problem with this approach is that it assumes a one-to-one correspondence between form and function. In this case, the assumption is that utterances which express the function of disapproval are always prefaced by such markers of disapproval as *That's wrong* or *That's not right* or *No*. This may well have been the dominant assumption in the 1960s, when pragmatics and discourse analysis were just in their developmental stages and these were not Brown and Hanlon's fields.

Indeed, they state (1970, p.51) "..we would like to express the distaste experimentalists

[ii] Indeed, subsequent studies which assert that corrective feedback does take place often use the same basic coding methodology as Brown and Hanlon, e.g. Demetras, Post & Snow (1986: 279).

must feel for the assumptions, compromises, and qualifications involved in the use of naturalistic data." There is now a consensus in the fields of pragmatics and discourse analysis, however, that, as Levinson (1983, p.291) puts it, "… there simply is no simple form-to-force correlation." Therefore, any function, such as disapproval or correction, can be accomplished by means of an unlimited variety of linguistic forms, which do not have to be prefaced by negative markers. Churchill famously expressed the function of disapproval (of a secretary's interfering with his prepositions) by writing: "This is the kind of English up with which I will not put!" King George V expressed disapproval of a proposed seaside visit by exclaiming: "Bugger Bognor!" and so on…

In other words, this meant that, although Brown and Hanlon were intending to search for disapproval related to grammatical incorrectness and hence negative evidence, this was not what they were actually searching for. What they were actually searching for was a correlation between the incidence of such markers as *That's wrong* or *That's not right* or *No* and grammatical incorrectness. As we will see below, this fundamental methodological dislocation meant that Brown and Hanlon did not locate examples of negative evidence relating to grammar which occurred in their own database simply because they were not prefaced by such markers as *That's wrong* or *That's not right* or *No*. Analysis below of extracts from transcripts from Brown and Hanlon's raw data will show that they do in fact contain examples of negative evidence.

This study would argue, therefore, that Brown and Hanlon's actual (but unreported) findings were that the terms *That's wrong* or *That's not right* or *No* are not generally used by adults in turns following ungrammatical utterances by children. The entire subsequent 'no negative evidence' hypothesis has equally been built on the premise that adults are expected to produce negative markers after grammatically incorrect utterances by children. As they do not do so, there is no negative evidence. The following, for example, is Marcus's much later (1993, p.58) characterisation of negative evidence:

> "Negative evidence is a parental behaviour that provides information about when sentences are not in the language. Negative evidence does not tell a child which sentences are grammatical: rather, it indicates that the child has uttered an ungrammatical sentence. Moreover, negative evidence does not tell a child why a particular sentence is ungrammatical….. The parental behaviour that provides negative evidence I will call the reply type. The reply type may take many forms: *the parent might say no, provide a repetition, shrug, or even spank the child*." (my italics)

The assumption, then, is that negative evidence reply types indicate that the child has uttered an ungrammatical sentence. However, none of the forms which Marcus gives as examples of negative evidence reply types indicate to a child that they have uttered an ungrammatical sentence, for the following reasons. A child's utterances may contain problems on several different levels.

The problems could be related to propositional content, grammar, lexis, phonology, or pragmatic issues. The *no* or

repetition on their own may well indicate to the child that there is a problem with the utterance, but they could just as well suggest to the child that the problem is related to propositional content, lexis, phonology, or pragmatic issues. For the reasons given below, children will normally assume in the first instance that any indication of a problem will be related to propositional content. The *shrug* or *spank* may indicate any number of things about the adult to the child, but the child is hardly likely to relate those actions to the ungrammaticality of their own utterance.

The historical development of the 'no negative evidence' hypothesis can be summarised from a discourse perspective as follows. Brown and Hanlon's (1970) actual findings were that the terms *That's wrong* or *That's not right* or *No* are not used by adults in turns following ungrammatical utterances by children. They jumped to a different level of analysis in suggesting they had found that no evidence that approval and disapproval are contingent on syntactic correctness. Subsequent researchers took this finding to prove that there was no corrective feedback and no negative evidence[iii]. This represented a further leap from one level of analysis to another. The 'no negative evidence' hypothesis was therefore reached by a double dislocation from Brown and Hanlon's actual findings and raw data, which (I will show below) do not support the hypothesis at all.

Why do adults not say 'no' to incorrect grammar?

In this section I will discuss Brown and Hanlon's actual finding that the terms *That's wrong* or *That's not right* or *No* are not generally used by adults in turns following ungrammatical utterances by children. This is actually a very valuable finding and could have led the research in an entirely different direction, had it been recognised as such.

We now need to consider why adults do not generally use such negative markers in turns following ungrammatical utterances by children. In CA methodology it is not sufficient to merely note the existence of an interactional phenomenon. It is necessary to try to locate the phenomenon within the interactional architecture of the discourse setting and provide a functional explanation for the phenomenon. Structural elements of discourse are seen as "...rationally and functionally adapted to the point or goal of the activity in question." (Levinson, 1992, p.71). The reason why adults do not generally use such negative markers is again related to pragmatics. A child's utterances may contain problems on many different levels.

The problems could be related to propositional content, grammar, lexis, phonology, or pragmatic issues. An adult interacting with a child has to perform an instant analysis of the child's utterance on all of these levels simultaneously and produce an instantaneous appropriate conversational response. In general, adult-child conversations are conducted on the basis of the two-way transmission of some kind of propositional content or meaning and the linguistic forms which the child uses are normally of secondary importance to the maintenance of the communication. The

[iii] Brown (1973: 465) himself suggests that the 1970 study showed that parents did not correct their children's grammar.

adult will have to instantly analyse the child's utterance (which may contain problems on a number of levels) and try to extract the propositional content or meaning in order respond to it. The adult response will therefore necessarily be aimed primarily at reacting to the propositional content or meaning contained in the child's utterance. This analysis corresponds perfectly with Brown and Hanlon's findings (1970, p.47):

> "Approval and disapproval are not primarily linked with the grammatical form of the utterance. They are rather linked to the truth value of the proposition, which the adult fits to the child's generally incomplete and often deformed sentence."

Brown and Hanlon (1970, p.49) provide a representative example:

Adam: And Walt Disney comes on Tuesday.
Mother: No, he does not.

If the adult successfully manages to extract the 'truth value' from the child's utterance, then the adult will need to shape a response, which will primarily orient to the propositional content or meaning. So the short answer to the question "Why do adults not say 'no' to incorrect grammar?" is that they are normally obliged to respond primarily to the propositional content or meaning of the child's utterance. However, this does not mean that they always ignore grammatical correctness, merely that they have to find other, secondary, methods of responding to it.[iv]

Is it possible for adults to provide corrective grammatical feedback. If so, how?

The adult, in designing a reply, will contruct it on the basis of a primary orientation to the propositional content or meaning of the child's utterance. However, single utterances can simultaneously function in a number of ways and on a number of levels: "… a single minimal utterance can perform, and can be carefully designed to perform, a number of quite different functions at one." (Levinson, 1983, p.311). Let us assume, hypothetically, that the adult notices a grammatical problem in the child's utterance and wants to put into his/her reply some form of corrective feedback. How can they do so? An instant, detailed grammatical analysis and explicit explanation is both beyond the capability of the average adult native speaker and impossible for the average young child to comprehend. Moreover, such overt correction would break up the flow of the interaction, which is normally primarily focussed on propositional content. However, the average adult native speaker is able to reformulate a child utterance with grammatical problems into a grammatically correct utterance, and we will see below that this is exactly what can happen in practice.

Nonetheless, in order to maintain the flow of the conversation, any such reformulation will have to be fitted into the already projected propositional content and conversational move of response to the child's utterance. Therefore, we can predict

[iv] In a parallel discourse setting, Seedhouse (1997) suggests that second language teachers systematically avoid direct, overt negative evaluation of linguistic errors. However, teachers do say 'no' when the second language learner makes a propositional or procedural error.

that adults will use reformulation as an indirect method of correcting the child's linguistic forms. This will function as a by-the-way occurrence in the business of maintaining the interactional and propositional momentum. This is indeed what we find in practice below in the analysis of Brown and Hanlon's transcripts. So, adult responses are not necessarily only doing one thing on one level at one time, as coding systems tend to suggest. A single utterance may be simultaneously be expressing approval on one level (e.g. in relation to propositional content) whilst nonetheless conducting correction on another level. For example, Tarplee (1989, pp. 286-288) shows how a single adult utterance simultaneously provides confirmation of the lexical correctness of an utterance and correction of the phonological production of the child's utterance.

How do adults actually respond to ungrammatical utterances by children?

In order to answer this question, and to see whether adults do actually provide negative grammatical evidence to children, we will analyse extracts from Brown and Hanlon's original raw data transcripts. First of all, however, it is necessary to establish a workable methodology for recognising negative evidence when we see it. There has been much debate concerning definitions and characterisations of negative evidence. As Sokolov and Snow (1994, p.50) show, the working definition of negative evidence has changed considerably over the years, whilst Saxton (1997, p.140) examines three approaches to defining negative evidence. This paper chooses to base the methodology on comments by Marcus (1993, p.59). Marcus disputes "the position that parents provide negative evidence to help their children learn language" (1993, p. 78) and in particular attacks what he calls 'discourse studies' (Bohannon & Stanowicz, 1988: Demetras, Post & Snow, 1986: Hirsh-Pasek, Treiman & Schneiderman, 1984:) which argue that case. Therefore, if our methodology is based on Marcus, one would hope that it will be acceptable to all proponents of the 'no negative evidence' hypothesis. Marcus (1993, p.59) provides a hypothetical dialogue:

Child: I eated the food.
Parent: I ate the food.

Marcus states that:

> "The parental reply clearly provides the child with a piece of positive evidence: I ate the food is a grammatical sentence. Positive evidence alone does not tell the child whether eated or ate are stylistic variants or synonyms or whether eated is unacceptable, but might do so in combination with internal mechanisms. *The parental reply could serve as negative evidence only if the child recognizes it as an exemplar of a recast and has mechanisms that use such information.* (my italics)"

Therefore, the methodology which we will use in this study for the identification in interaction of negative evidence in relation to grammar is that the interaction will follow this sequence:

1) The child produces an utterance.
2) The adult produces an utterance which modifies in some way the grammar of the

child's utterance.
3) The child subsequently adopts the modified grammar.

The child's adoption of the modified grammar in subsequent interaction is evidence that "the child recognizes it as an exemplar of a recast and has mechanisms that use such information." This means that the methodology is grounded in an interactional sequence rather than in surface linguistic markers with an assumed correspondence with function. By a happy coincidence, the methodology also corresponds very neatly to the CA methodological maxim that:

> "The display of (conversationalists') understandings in the talk of subsequent turns affords both a resource for the analysis of prior turns and a proof procedure for professional analyses of prior turns - resources intrinsic to the data themselves." (Sacks, Schegloff and Jefferson, 1974, p.729).

If for some reason this methodology is not acceptable to proponents of the 'no negative evidence' hypothesis, the onus would be then on them to provide a workable alternative methodology for the analysis of the discourse.

Having established a methodology, we can now examine 6 extracts from a very small sample (Adam 28) chosen from Brown's (1973) original transcripts[v] to see whether there is any evidence of negative evidence. Firstly, though, it is important to appreciate just how small a proportion of Brown's total database this single transcript represents. Adam 28 consists of 2 hours of recording out of a total of 110 hours of recording of Adam alone; the database also includes 40 hours of Eve and 278 of Sarah. In these data, CHI is the child, Adam at 3 years 4 months. MOT is his mother and URS is Ursula, the research investigator who is recording the interaction.

Extract 1

1 CHI: is de carpenter still down dere?
2 MOT: I don't know.
3 MOT: perhaps he's finished too.
4 CHI: did he took his pencil sharpener?
5 MOT: did he take his pencil sharpener?
6 CHI: yeah.
7 MOT: whose pencil sharpener was that?
8 CHI: Mr Grant.
9 CHI: did he take it?
10 MOT: no.

In this extract Adam produces an ungrammatical question in line 4. In line 5 his mother repeats the question but has replaced the incorrect form 'took' with 'take'. In line 9 we see that Adam has analysed his mother's line 5 as a correction and has taken it up in that he produces the question in a grammatically correct form. It should be noted that this is not a 'mindless repetition' because a) there is a slight transformation, 'his pencil sharpener' becoming 'it' b) Adam takes 2 other turns before producing the corrected form.

Extract 2

1 CHI: Robin don't play with pens.
2 URS: why?

[v] Available through the CHILDES System, MacWhinney (2000): http://childes.psy.cmu.edu

3 CHI: do he play with pens?
4 URS: sometimes he does.
5 CHI: sometimes he does and you take them from him?
6 URS: if he takes them apart I take them from him.
7 CHI: does he take this apart? *(clear "does he")*
8 URS: he tries.
9 CHI: he tries?
(56 lines later)
10 CHI: does dis write?

In this extract Adam again produces an ungrammatical question in line 3. This time his researcher (Ursula) performs an 'embedded correction' that is, a repair done in the context of a conversational move:

> "That is, the utterances are not occupied by the doing of correcting, but by whatever talk is in progress ... What we have, then, is embedded correction as a by-the-way occurence in some ongoing course of talk." (Jefferson, 1987, p.95)

In this case the conversational move is a reply which transforms 'do' to 'does'. Again the important point is not the way in which the adult shapes the correction, but whether the child analyses it as a correction and takes it up. The evidence that the child has analysed it as a correction and taken it up is that the child produces the correct form in lines 5 and 7. Furthermore, 56 lines later in the transcript Adam produces the question in the correct form again. Note again that line 7 is not a 'mindless repetition'. Ursula has actually supplied 'does' in line 4 in the answer form and Adam still has to do some work in transferring this to the question form in line 7.

Extract 3

1 CHI: I a monster.
2 MOT: what kind of monster?
3 CHI: nothing monster.
4 MOT: a sea green monster.
5 MOT: I'm a monster now.
6 CHI: I am the monster now.

Here Adam omits the copula in line 1. There is then embedded correction in line 5 in that the mother repeats line 1, this time with the copula. The evidence that Adam analyses this as correction is that he uses the copula in the following line.

Extract 4

1 CHI: is it was a snake huh?
2 MOT: what?
3 CHI: is it was snake?
4 MOT: is it was a snake?
5 MOT: was it a snake?
6 MOT: yes
7 MOT: it was a snake.
8 CHI: what is dat in (th)ere?
9 MOT: it's a shell.
10 CHI: what is it?
11 MOT: it sounds like the ocean.
12 CHI: ocean what?
13 MOT: it's a sea shell.
14 CHI: is it a toy?
15 MOT: no it's a real shell.

In lines 1 and 3 Adam produces an ungrammatical question. This is corrected by his mother in lines 4 and 5 by contrasting the incorrect question with a corrected version of the same question and then answering the corrected question. It is not quite clear whether there is uptake or not. Adam subsequently produces a correctly

formed yes-no question in line 14, although it is in a different tense from the one which was corrected by his mother.

Extract 5

1 URS: no it's all gone all put away.
2 CHI: did you put away?
3 URS: I put it away.
4 CHI: why you put it away?
5 CHI: where it went?
6 URS: in my purse.
7 CHI: did it crawl in your purse?

In line 2 there is a grammatical problem in that Adam omits the object 'it' from his question. Ursula uses embedded correction in line 3 in an answering move which mirrors the grammatical structure of Adam's question and which inserts the missing object pronoun. In lines 4, 5 and 7 we see evidence of uptake in that Adam is using the object pronoun.

Extract 6

1 MOT: oh right here.
2 CHI: an(d) dat a kitchen.
3 MOT: oh that's the kitchen.
4 CHI: an(d) dat's a kitchen.
5 MOT: you have two kitchens.
6 CHI: yeah.

The problem in line 2 is that Adam does not use a copula. The mother performs an embedded correction in line 3, again mirroring Adam's original structure but this time inserting the copula. The interactional move in line 3 appears to be of acknowledgement, or of receipt of new information, with 'oh' functioning as a marker of change of information state (Heritage, 1984). We see uptake of the correction in line 4.

So, from these two hours of adult-child interaction from Brown and Hanlon's source data, we have found 1 unclear and 5 clear examples of negative evidence related to grammar with child uptake. In Adam 28 I also found 11 examples of Adam producing ungrammatical utterances, the adults providing corrective feedback and Adam not displaying uptake of this feedback, e.g.:

Extract 7

URS: What did he say?
CHI: Say he examine me.
URS: He examined you?
CHI: Yeah.

This does not of course mean that Adam did not take up the correction; we have no evidence one way or the other. However, according to the methodology adopted, we cannot count these as examples of negative evidence. The above examples of negative evidence could not possibly have been located by Brown and Hanlon's original search because the supply and uptake of negative evidence is embedded in an interactional sequence. Negative evidence is not marked, for the reasons given above, by surface linguistic features such as 'no' or 'wrong'.

It is not at all clear how generalisable this finding is, since I selected Adam 28 at random from Brown and Hanlon's large database. I will therefore try to answer the question: how do adults deal with ungrammatical utterances by Adam in these 2 hours? The adults do not provide any corrective feedback in the case of the vast majority of ungrammatical

utterances produced by Adam. The adults respond primarily to the propositional content of Adam's utterances. Sometimes (11 examples) Adam produces ungrammatical utterances, the adults provide corrective feedback and Adam does not display uptake of this feedback. Sometimes (5 clear and 1 unclear examples) the adults provide negative evidence related to grammar with child uptake. The negative evidence is predominantly supplied in the form of embedded correction, although overt correction does occur. Clearly, negative evidence related to grammar is provided by adults and used by children during these 2 hours.

What are the effects of the supply of negative evidence?

I would now like to consider possible objections to this analysis from proponents of the 'no negative evidence' hypothesis and to link the analysis in with other recent research studies which suggest that negative evidence is supplied and taken up.

Objection 1) *Although it might seem that the adults are correcting and the children are taking up the corrections, there is no evidence that that is how the participants understand what is happening, nor that children are able to utilise such corrections.*

As far as the parents are concerned, there are two possible types of evidence that they are aware of the correcting function of their responses. The first is from Brown himself (1973, p.465). Referring to his 1970 study, he says that he found that "In general the parents seemed to pay no attention to bad syntax nor did they even seem to be aware of it." He adds that "This is a surprising outcome to most middle-class parents, since they are generally under the impression that they correct the child's speech." In other words, the parents believed they did correct their child's speech, but Brown and Hanlon (1970) believed that they had established that the parents did not. However, this paper would suggest that the parents were right. Brown and Hanlon (1970) had assumed that correction would be marked in a particular way and drew the wrong conclusions when they did not find what they had expected. If they had asked the parents how exactly they corrected their child's speech, their conclusions might have been very different. The second type of evidence is interactional, in the way that parents can carefully design their turns to display them as corrections, as in extract 4.

As far as the child's perspective is concerned, a number of 'no negative evidence' studies have argued that negative evidence is not supplied in a form which can be utilised by the child. Marcus (1993, p.78) suggests that, if negative feedback exists, it is too 'noisy' to be able to be used by the child for grammatical development.

Learnability theorists (Grimshaw & Pinker, 1989; Morgan & Travis, 1989) have suggested that it is necessary to show that children are able to utilise any information supplied to acquire language. Therefore, it is necessary to provide and empirically test a convincing model as to how the child might be able to utilise information provided in the interactional sequence examined in this paper in order to upgrade their grammatical system. Such a model is presented by Saxton (1997) as the Contrast Theory of

negative input. Saxton (1997, p.139) describes and exemplifies the "unique discourse structure created in the juxtaposition of child error and adult correct form." which is identical to the interactional sequence described in the current paper. Saxton (1997, p.155) then presents the Direct Contrast Hypothesis as follows:

> "When the child produces an utterance containing an erroneous form, which is responded to immediately with an utterance containing the correct adult alternative to the erroneous form (i.e. when negative evidence is supplied), then the child may perceive the adult form as being in CONTRAST with the equivalent child form. Cognizance of a relevant contrast can then form the basis for perceiving the adult form as a correct alternative to the child form. The corrective potential of negative evidence is seen to arise from the immediate juxtaposition of child and adult forms. For it is predicted that a direct contrast, or conflict, is created between the two forms, which can presage awareness in the child that the form she has produced is erroneous. The Direct Contrast hypothesis predicts that negative evidence is especially well adapted for highlighting not only the existence of such contrasts, but moreover, for revealing which of two linguistic forms should be retained and which rejected."

The model and hypothesis were tested in an experimental design described in Saxton, 1997, with the result that "the experiment reveals that children are far more willing to reproduce a correct irregular past tense form when it is presented in the form of a negative, rather than positive, input." (Saxton, 1997, p.153)

Objection 2) *Even if uptake of correction does occur in these sequences, there is no evidence that this will create permanent changes in the child's grammatical system.*

In order to determine the longer-term effects of negative input, Saxton et al (1998, p.720) adopted an experimental approach, which concluded that "it would appear that the effects of negative evidence on the child are not merely transitory in nature, but may persist over an extended period of time."

Discussion

Brown and Hanlon's actual (but unreported) findings from their raw data were that the terms That's wrong or That's not right or No are not used by adults in turns following ungrammatical utterances by children. They also reported that adults primarily respond to the propositional content of child utterances. This study analysed Brown and Hanlon's raw data using a CA methodology and agrees that these two findings are robust, but that adults nonetheless sometimes conduct grammatical correction and that this correction is sometimes taken up by children. A sketch of part of the interactional architecture of adult-child interaction provided a functional explanation for the co-occurrence of these three phenomena.

This study concludes not only that the architecture of adult-child interaction enables the provision and uptake of negative evidence, but also that Brown and Hanlon's raw data and actual findings support this conclusion. This analysis is also compatible with recent work by Saxton which models

how children are able to make use of negative input and provides experimental evidence that they do so. As Saxton (1997, p.145) puts it, " The 'no negative evidence' assumption has been allowed to proliferate, largely unhindered, so that now it is often presented in the guise of a foundational empirical finding within developmental psycholinguistics." This study suggests that the entire edifice of the 'no negative evidence' hypothesis has been built up on the suspect foundations of a double dislocation from actual findings and a flawed discourse analysis methodology. This paper reinforces, from a discourse perspective, findings by Saxton (1998, p.718) that "every empirical study on negative input has established that negative evidence (as defined here) is available, not only for all children studied, but for every individual grammatical structure examined."

Finally, we need to examine the issues raised in relation to methodologies for the analysis of naturally occurring interaction. According to Levinson (1983, p.286) there are two major approaches to the study of naturally occurring interaction: discourse analysis (DA) and conversation analysis (CA). Brown and Hanlon (1970) and other studies supporting the 'no negative evidence' hypothesis are essentially DA or coding studies, whose basis is that utterances are coded or translated into a function. For example, "Could I borrow your pencil?" could be coded as 'request'. Brown and Hanlon (1970) clearly adopt this approach in that they assume that the function 'disapproval' can be unproblematically translated into the forms That's wrong or That's not right or No. One reason why DA and coding approaches have proved popular is that coded utterances can be treated quantitatively, whereas raw interaction appears 'messy'.

This study has suggested that the architecture of adult-child interaction is organised to handle multiple sources of trouble in the child's utterances and that the interaction therefore necessarily operates on multiple levels at once. Halliday (1985, xxxiv) notes that "The context of spoken language is in a constant state of flux, and the language has to be mobile and alert..... The complexity of spoken language is more like that of a dance; it is not static and dense but mobile and intricate." DA and coding systems are unable to portray the 'dance' of the interaction because they are essentially static approaches which translate interaction into fixed and unidimensional coordinates on a conceptual map. The problem so far in the 'negative evidence' debate has been the application of blunt methodological instruments to subtle, complex interaction which 'dances' (in Halliday's terms) on multiple levels. In the case of Brown and Hanlon, the instrument was so blunt that it was unable to locate the phenomena it was searching for. It is therefore possible that there is considerable evidence, in the databases of adult-child interaction currently available[vi], as to how children use interactional input from others to upgrade their language system. However, for the reasons given above and below, the evidence cannot be unlocked by DA or coding approaches.

[vi] In particular, the CHILDES System, MacWhinney (2000): http://childes.psy.cmu.edu

Indeed, they may actually tell us that there is no evidence there.

This study hopes to have demonstrated that a CA methodology can be of use in locating such evidence and in analysing child-adult interaction. Important interactional phenomena may be resistant to DA or coding approaches for three reasons. Firstly, as Levinson (1983, p.278) puts it, "the functions that utterances perform are in large part due to the place they occupy within specific conversational (or interactional) sequences." In this study, negative evidence was found to be embedded in an interactional sequence rather than in surface linguistic features.

Secondly, coding studies in this area start from the assumption that language learning phenomena can be directly observed in and extracted from the interaction to make psychological points without considering the intervening interactional architecture of the speech setting. So, Brown and Hanlon started from the flawed assumption that parents would unproblematically be able to say 'no' to incorrect grammar. By contrast, this study sought a functional explanation as to why this was in fact problematic in the interactional architecture of the speech setting.

Thirdly, a single utterance can perform multiple functions, speech acts, and conversational moves at the same time. This study suggests that adult correction of child utterances may often be carried out as a secondary function in the context of a conversational move responding to propositional content. This study concludes, then, that the language learning evidence we want to locate in the interaction is embedded to a considerable degree in the multi-dimensional and sequential nature of the interactional architecture and that it can best be portrayed and analysed by using a CA or similar approach.

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