

The Role of Error Correction in Second Language Teaching*

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Introduction

The aspect of interaction in classrooms with the widest scope is probably that generally referred to as feedback, which includes the notion of error correction. Feedback has been widely investigated in information theory and general communication research outside classroom or language learning contexts (Annett 1969). In any communicative exchange, speakers derive information from their listeners as to the positive or negative reception and comprehension of their message. This information may be actively solicited by speakers by means of what are often called "comprehension checks". Listeners also provide feedback explicitly in behavior such as questioning looks or prompts, interjections and rejecting comments, or implicitly in "backchannel" cues such as "Oh, I see, uhm hm," or in the lack of any signals of non-comprehension. Participants in natural communication actively, and usually equally, exchange and negotiate this sort of information in many ways.

In the classroom, the special circumstances of the teacher having superior knowledge and status results in an imbalance in expectations as to who provides feedback and when it is provided. Aside from general instruction, the primary role of language teachers is often considered to be the provision of both error correction, a form of negative feedback because of its inhibitory effect, and positive sanctions or approval of learners'

production. In most other social interactions, no one participant is pre-specified as having the automatic right to impose judgment on the others' behavior, especially linguistic behavior. If correction of another is to be done, it is done so discreetly, with deference, since there is a strong preference to allow speakers to correct themselves (cf. Schegloff, Jefferson, and Sacks 1977). Repair of the communication by another is usually only allowed in the form of non-comprehension signals such as clarification requests, confirmation checks, or indications of non-comprehension.

This differential right to the floor results in the final step of the classic pedagogical exchange cycle of teacher initiation/solicitation - student response - teacher feedback/evaluation, where this final step is the most unusual in comparison with natural conversations. Teachers evaluate any and all student behavior, whether nonverbal or verbal, subject content or language form. Yet, the impossibility of consistently applying standards of appropriateness or correctness leads to the perhaps unwanted result that learner behavior not receiving admonishment or correction is by default taken to be appropriate or correct. Feedback, as contrasted with the narrower notion of "correction", is therefore an inevitable constituent of classroom interaction, for no matter what the teacher does, learners derive information about their behavior from the teacher's reaction, or lack of one, to their behavior.

From the language teacher's point of view, the provision of feedback is a major means by which to inform learners of the accuracy of both their formal target language (TL) production and

their other classroom behavior and knowledge. From learners' point of view, the effectiveness of externally provided feedback depends on the degree to which it helps them repair their utterances. My purpose in this article is to examine the research evidence that would clarify how much teachers' feedback aids learners' improvement in repairing TL productions.

Feedback and learning

The study of feedback in learning situations has a long history, closely tied to behaviorist learning theory, programmed learning, and instructional technology (cf. Kulhavy 1977, for a critical review of this research in first language (L1) content teaching). Adopting the notion of reinforcement of behavior as a fundamental source of learning, this view of feedback equates it with positive or negative reinforcement, which would result in either a strengthening or weakening of a student response, respectively. The audiolingual approach to language teaching took this view (Lado 1957, Brooks 1960), with positive feedback usually being considered as either positive praise - "Very good" - or even repetition of the student's correct response. For negative feedback, however, the traditional approach relied on grammar explanations and modelling of the correct response, usually assuming the ability of the learner to recognize the difference between the model and their errors, which we will shortly see is a problematic assumption.

Without detailing the historical developments in language teaching theory (cf. critical discussion in Lucas 1975, Long, 1977, Chaudron 1977c, Hendrickson 1978, and Courchene 1980), we

must now recognize that the adequacy of this view of feedback in language learning has been discounted. In a cognitive view of learning (one general alternative to behaviorist theories) the function of feedback is not only to provide reinforcement, but to provide information which learners can use actively in modifying their behaviors (cf. Zamel 1981, and Annett's 1969 tripartite function of feedback - reinforcement, information, motivation). Several models of second language (L2) acquisition now include the process of hypothesis-testing as an integral part of learners' interlanguage development (cf. Faerch and Kasper 1980, Krashen 1983, Schachter 1983a, b, and a comparison of these views in Chaudron 1985). The information available in feedback allows learners to confirm, disconfirm, and possibly modify the hypothetical, "transitional" rules of their developing grammars, but these effects are dependent on the learner's readiness for and attention to the information available in feedback. That is, learners must still make a comparison between their internal state of a rule and the information about the rule in whatever input they encounter. The nature of this comparison remains to be elaborated on by L2 learning theorists.

As to readiness and attention, Vigil and Oller (1976) point out that the positive or negative information about TL forms that is present in feedback does not constitute feedback's complete effect: there is the further continuum of positive, neutral, or negative affective feedback present in conversation (a motivational effect), which can interact with cognitive information factors and influence learners' efforts to attempt

Teacher: Come on, Eulyces, you missed something here.
Just say it over again.
Eulyces: Twenty...
Teacher: the twenty-first.
Eulyces: twenty-first of February
nineteen sixty-three
Teacher: Good.

[Stokes 1975:7]

Oral error correction

Up to this point, we have considered theoretical views and analyses. But what does empirical research suggest as to the practice of error correction in L2 classrooms? To organize this research, we will address the same questions asked by Hendrickson (1978) in his review of research on L2 feedback. Hendrickson's answers to these questions were tentative and based largely on non-empirical work. Yet the empirical work which is summarized here will largely support his conclusions. After responding to these questions with regard to oral error treatment, we will summarize research on the correction of written errors.

- 1) Should learner errors be corrected?
- 2) If so, when should learner errors be corrected?
- 3) Which learner errors should be corrected?
- 4) How should learner errors be corrected?
- 5) Who should correct learner errors?

1. Should learner errors be corrected?

Hendrickson (1978) arrived at an affirmative answer to this question, with the argument following the hypothesis-testing rationale noted in the previous section. His justification was primarily theoretical, with one empirical study of learners' preferences cited. Cathcart and Olsen (1976) compiled 149 adult ESL learners' responses to a questionnaire. They showed a strong preference for correction of all errors. However, when one teacher involved in the study attempted to provide such

treatment, her class agreed it was undesirable, since it rendered communication impossible. A more recent survey by Chenoweth, Day, Chun, and Luppescu (1983) of over 400 adult ESL learners' attitudes to interactions with native speaker (NS) friends also found a strong preference for more error correction, in this case in the context of social encounters. These subjects' desire for more correction, which was rated on a relative scale, may arise from the very low rate of correction (about 9% of errors) that this population encountered in NS-non-native speaker (NNS) social conversations (Chun, Day, Chenoweth, Luppescu 1982). Whether learners' errors should be corrected may not, however, depend entirely on their preferences, although satisfaction of their perceived need may be important for a positive attitude. The answer should follow primarily from evidence of the effectiveness of error correction, a distinctly difficult phenomenon to demonstrate, although we will make an effort here.

2. When should learner errors be corrected?

Hendrickson concluded that error correction should be confined more to "manipulative grammar practice," leaving communicative activities free of a focus on error correction. He again considered theoretical views, and one empirical survey. As with the first question, research would have to demonstrate differential effectiveness for correction at different times. Several studies of error correction in L2 classrooms have since demonstrated the degree to which teachers correct errors, and these patterns appear to reflect the priorities Hendrickson suggests.

Classroom teachers will likely correct learners' errors either when they pertain to the pedagogical focus of the lesson or when they significantly inhibit communication. This was demonstrated, for example, in Chaudron (1977b/1986). Three Grade 7 and 8 French immersion teachers were observed and their corrections in Math, Science, Geography, and French class were counted. The three teachers demonstrated a priority for correcting errors of subject matter content in all classes (from 75% to 100% of such errors were corrected), while French grammatical errors were corrected most in French classes (77% on average), but not in other subjects (37% on average). Moreover, late in the school year (April), the rate of correction of grammatical errors in French class was lower (66%) compared to early in the year (October - 95%), indicating a gradual acceptance of deviant forms in the learners' production (especially morphological errors contributed to this decrease).

Courchêne (1980) observed a similar strong preference among 10 teachers in pre-university and university level adult ESL courses. These teachers corrected 100% and 97%, respectively, of subject content and lexical errors, compared with 46% and 41% of grammatical and phonological errors.

A further justification for the claim that pedagogical focus is a major determinant of when errors get treated is the extent to which no error treatment was provided by teachers, that is, the extent to which errors were ignored entirely. In two studies of English as a foreign language classrooms with non-native teachers, Lucas German study (1975) and Yoneyama (1981) in Japan found the percentage of errors ignored was low, between 10% and

15%, reflecting presumably a high priority for error correction in such EFL grammar-based instruction.

In adult ESL classes, on the other hand, Salica in the U. S. (1981), Courchéne in Canada (1980), and Lucas in Israel (1975) found the percentage of errors ignored was noticeably higher, between 42% and 49%. Furthermore, Lucas (1975) contrasted native and non-native teachers in Israel (5 teachers each). She found that natives were more tolerant of errors, ignoring 53% of all errors in contrast to 31% for non-natives. It should be noted that this contrast held especially for phonological errors, somewhat for syntactic errors, and not for lexical ones. Second language contexts presumably permit a freer communicative use of the TL with less emphasis on formal correctness.

In general, these tendencies across different L2 contexts demonstrate the prevalence of the principles that Hendrickson suggested: when instructional focus is on form, corrections occur more frequently.

3. Which learner errors should be corrected?

Hendrickson (1978) again summarizes theoretical views and several empirical studies of NS reactions to learners' errors:

...correcting three types of errors can be quite useful to second language learners: errors that impair communication significantly; errors that have highly stigmatizing effects on the listener or reader; and errors that occur frequently in students' speech and writing. (Hendrickson 1978:392)

Although these criteria are appealing, they of course need to be studied empirically to see whether in fact correcting any particular type of error is effective. There are increasing

indications that L2 learners' interlanguages progress at a rate determined by other factors, such as universal sequences and communicative need. These sources of development reduce the direct applicability of Hendrickson's principles. Nevertheless, if communicative interaction and feedback have any role to play in aiding learners' progress, these three criteria probably have some validity, for such errors would be the most noticeable in communicative interaction.

In Table 1, data from all studies which reported relative proportion of types of error and amount of teacher correction of

Insert Table 1 about here

those types is presented. For the most part, comparable categories of error were used in these studies, but when not, the types have been situated in the most commonly accepted category. As a result, comparisons across studies must be interpreted cautiously. Taking into account some studies' lack of error counts in some categories, there is remarkable similarity in general proportion of error types observed. Of total errors, the median percentages of errors produced among the studies are: phonological - 29%, grammatical - 56%, lexical - 11%, content - 6%, and discourse - 8%. The trends for proportion of errors corrected (see medians) appear to reflect the general rate at which errors would be made in classrooms, in an inverse relationship where the more a type of error is made, the less likely the teacher appears to be inclined to correct it. Note the lower proportions for phonological and grammatical errors,

Table 1
Rate of Error Production and Teacher Treatment

<u>Type of error</u>	<u>Salica</u> 1981 (@)	<u>Courchène</u> 1980	<u>Chaudron</u> 1977b (*)	<u>Fanselow</u> 1977b	<u>Lucas</u> 1975(#) NS NNS	<u>Median</u>
<u>Phonological</u>						
% of total errors	--	32%	29%	28%	28% 32%	29%
% treated	--	41%	54%	17%	67% 61%	54%
<u>Grammatical</u>						
% of total errors	75%	56%	42%	53%	63% 55%	56%
% treated	51%	46%	50%	76%	36% 47%	49%
<u>Lexical</u>						
% of total errors	11%	11%	3%	12%	9% 13%	11%
% treated	67%	97%	75%	94%	97% 92%	93%
<u>Content</u>						
% of total errors	6%	3%	19%	--	-- --	6%
% treated	85%	100%	90%	--	-- --	90%
<u>Discourse</u>						
% of total errors	9%	--	8%	7%	-- --	8%
% treated	94%	--	61%	95%	-- --	94%

@ Does not include phonological errors

* Collapsed across both observation times

Separated by teacher type because significant difference found

but higher for lexical, content and discourse. Whereas Hendrickson's third principle suggests correcting the most frequent errors, this may in fact be the opposite of teachers' tendencies.

In addition to the disclaimer that these patterns do not justify particular priorities in error correction, these data on actual treatment of errors in classrooms do not reflect the extent to which the teachers involved truly made efforts to correct the errors. The proportions refer to any "treatment," and it now deserves qualification that error treatment comprises a wide range of behaviors. This brings us to the crux of the problem of error correction.

4. How should learners' errors be corrected?

A large number of empirical studies of error correction in classrooms and of repair of communication breakdown in natural conversation have been primarily concerned with the forms and functions of the teacher or listener's feedback. [For studies in natural L1 conversational repair cf. Schegloff, et al. 1977; for studies of L1 teachers' reacting moves, cf. Bellack, et al. 1966, Zahorik 1968, Hughes 1973, Sinclair and Coulthard 1975; for studies of NS-NNS or MNS-NNS conversations, cf. Gaskill 1980, Schwartz 1980, Chun, et al. 1982, Day, et al. 1984, Varonis and Gass 1985; for L2 classrooms, cf. Allwright 1975a, b, Stokes 1975, Fanselow 1977, Long 1977, Chaudron 1977a, Rehbein 1984, Bruton and Samuda 1980, Kasper 1985, van Lier 1985, Pica and Doughty 1985.] To varying degrees these studies identify the choices available to participants in reacting to a perceived

error or miscommunication.

Types of feedback

There are initial issues concerning the cycle of turn-taking in the classroom and the teacher's options there. For the sake of time, however, I will only consider the nature of discourse acts as types of feedback. The essential options available to the teacher for providing feedback, whether negative or positive, comprise virtually every sort of pedagogical or conversational act: confirmation checks, clarification requests, repetition, models, explanations, etc. These acts can be constructed in perhaps an infinite variety of ways to indicate several basic feedback options or purposes, of which Allwright (1975b) lists the following:

- Fact of error indicated
- Blame indicated
- Location indicated
- Model provided
- Error type indicated
- Remedy indicated
- Improvement indicated
- Praise indicated
- Opportunity for new attempt given [Allwright 1975b:104]

Thus, not only cognitive information regarding the fact, location, and nature of the error is possible, but motivational and reinforcement acts are possible. Numerous other researchers have proposed various sets of categories of feedback types, but Chaudron previously noted (1977a) that these usually do not consist of elemental discourse units. General descriptors such as "explicit" and "implicit", "correcting" and "helping", just as Allwright's options (which he called "features"), require high-level inferences about the interactants' intentions, in addition

to knowledge to be derived from the discourse structures and the context, or from independent inquiries. While such inquiries are a legitimate undertaking of the discourse analyst, Chaudron proposed (1977a) a more elementary, low-inference set of structural types and features of corrective discourse which involve fewer assumptions about intentions, effects, or context. These types and features are listed in Table 2, from Chaudron (1977a:38-39).

Insert Table 2 about here

"Types" are deemed to be capable of standing independently, like free morphemes, whereas "features" are bound, dependent on the context. For example, an "interruption" is a feature, because it depends on the context, whereas there are identifiable exponents of "acceptance" and "negation". Some structures can be either types or features, however.

Problems with feedback

The usefulness of such a set of feedback acts is most evident when one considers the problems that researchers have noted regarding inconsistency, ambiguity, and ineffectiveness of teachers' corrections. Many of these problems stem from the multiple functions that very similar discourse structures can perform.

First, one of the most noted problems with corrective feedback is that "repetition" of a speaker's utterance can serve several functions, of either a negative (correcting) or a positive nature (agreeing, appreciating, understanding -- these

TABLE 2

Features and Types of Corrective Reactions in the Model of Discourse

Feature or Type of "Act" (F and/or T)	Description	Example of Exponent of Expression
IGNORE (F)	Teacher (T) ignores Student's (S) ERROR, goes on to other topic, or shows ACCEPTANCE* of content.	
INTERRUPT (F)	T interrupts S utterance (ut) following ERROR, or before S has completed.	
DELAY (F)	T waits for S to complete ut. before correcting. (Usually not coded, for INTERRUPT is "marked")	
ACCEPTANCE (T)	Simple approving or accepting word (usually as sign of reception of ut.), but T may immediately correct a linguistic ERROR.	Bon, oui, bien, d'accord
ATTENTION (T-F)	Attention-getter; probably quickly learned by Ss.	Euhh, regarde, attention, allez, mais.
NEGATION (T-F)	T shows rejection of part or all of S ut.	Non, ne . . . pas.
PROVIDE (T)	T provides the correct answer when S has been unable or when no response is offered.	S: Cinquante, uh . . . T: Pour cent.
REDUCTION (F) (RED.)	T ut. employs only a segment of S ut.	S: Vee, eee . . . (spelling) T: Vé . . .
EXPANSION (F) (EXP.)	T adds more linguistic material to S ut., possibly making more complete.	S: Et c'est bien. T: Ils ont pensé que c'était bien?
EMPHASIS (F) (EMPH.)	T uses stress, iterative repetition, or question intonation, to mark area or fact of incorrectness.	S: Mille. T: Mille?
REPETITION with NO CHANGE (T) (optional EXP. & RED.)	T repeats S ut. with no change of ERROR, or omission of ERROR.	T: (les auto-routes) n'a pas de feux de circulation.
REPETITION with NO CHANGE and EMPH. (T) (F) (optional EXP. & RED.)	T repeats S ut. with no change of ERROR, but EMPH. locates or indicates fact of ERROR.	S: Mille. T: Mille?
REPETITION with CHANGE (T) (optional EXP. & RED.)	Usually T simply adds correction and continues to other topics. Normally only when EMPH. is added will correcting CHANGE become clear, or will T attempt to make it clear.	S: Le maison est jaune. T: La maison est jaune.
REPETITION with CHANGE and EMPHASIS (T) (F) (optional EXP. & RED.)	T adds EMPH. to stress location of ERROR and its correct formulation.	S: Doo tout . . . T: Du tout. (stress)
EXPLANATION (T) (optional EXP. & RED.)	T provides information as to cause or type of ERROR.	
COMPLEX EXPLANATION (T)	Combination of NEGATION, REPETITIONS, and/or EXPLANATION.	S: Uh, E. (spelling 'grand') T: D. Non, il n'y a pas de E.
REPEAT (T)	T requests S to repeat ut., with intent to have S self-correct.	
REPEAT (implicit)	Procedures are understood that by pointing or otherwise signalling, T can have S repeat.	
LOOP (T)	T honestly needs a replay of S ut., due to lack of clarity or certainty of its form.	
PROMPT (T)	T uses a lead-in cue to get S to repeat ut., possibly at point of ERROR; possible slight rising intonation.	S: Petit. Grande. T: Petit . . .
CLUE (T)	T reaction provides S with isolation of type of ERROR or of the nature of its immediate correction, without providing correction.	S: Les stations-services sont rares. T: Sont rares? Au présent?
ORIGINAL QUESTION (T)	T repeats the original question that led to response.	
ALTERED QUESTION (T)	T alters original question syntactically, but not semantically.	
QUESTIONs (T) (optional RED., EXP., EMPH.)	Numerous ways of asking for new response, often with CLUES, etc.	
TRANSFER (T)	T asks another S or several, or class to provide correction.	
ACCEPTANCE* (T)	T shows approval of S ut.	
REPETITIONs* (T)	Where T attempts reinforcement of correct response.	
EXPLANATION* (T)	T explains why response is correct.	
RETURN (T)	T returns to original error-maker for another attempt, after TRANSFER. A type of VERIFICATION.	
VERIFICATION (T-F)	T attempts to assure understanding of correction; a new elicitation is implicit or made more explicit.	
EXIT (F)	At any stage in the exchange T may drop correction of the ERROR, though usually not after explicit NEGATION, EMPH., etc.	

terms are from Gaskill 1980). Repetitions are among the most common types of corrective feedback. In two studies using Chaudron's (1977a) model, Salica (1981) found three types of repetition (including approving repetition) among the four most common corrective treatment acts (a total of 32% of acts), and Nystrom (1983) found three teachers using repetition 15 - 20% or more of the time.

As Chaudron (1977a) pointed out, correcting repetitions usually contain some additional information or discourse feature that signals them to be corrections instead of confirmations, such as a slight modification (reduction or addition or substitution) of the original utterance, an emphasis in stress or lengthening of a segment, questioning intonation, or other correcting acts. A second problem is thus that, for L2 learners, whose grammar may not encompass the target rule, the modification or emphasis may be imperceptible or perceived as merely an alternative to their own utterance, because accepting, approving, confirming repetitions occur frequently in the same contexts. The classic case of this sort of confusion is an example from Fanselow (1977):

Ex. 2 Teacher: It's blue.
 Student 1: It blue.
 Teacher: It's blue.
 Student 2: It's blue.
 Teacher: It's blue.
 Student 1: It blue.
 Teacher: It's blue.
 Student 1: It blue. [Fanselow 1977:588]

As illustrated in Chaudron's (1977a) comparison among types of repetitions, the key to being more successful in such a situation, if success is in fact desirable, is probably for the

teacher to provide more explicit emphasis on the modification, either by reducing the repetition ("It's") and/or by stressing the /s/.

A final problem is perhaps the most general one. Even a cursory reading of the literature on feedback will reveal that the term "correction" is used in a variety of meanings. Chaudron (1977a) pointed out that there are several increasingly narrow denotations of this term. The most general is equivalent to "treatment of error," which appears to be the most widely employed meaning, used to refer to any teacher behavior following an error that minimally attempts to inform the learner of the fact of error -- the treatment may not pursue correction further. Note that such treatment may be evident only to the outside observer or to the inner monitor of the teacher, but not to the learner. The next most general meaning refers to some treatment which is explicit enough to elicit (or which makes great efforts to elicit) a revised student response. And finally, there is the "true" correction which succeeds in modifying the learner's interlanguage rule so that the error is eliminated from further production.²

Even a cursory reading of the literature will reveal that these three meanings are not clearly or consistently distinguished at times, leading to assumptions about the "explicitness" or "implicitness" of treatments and their subsequent effects. To our knowledge, there is no study of classroom error correction which investigates the third, most narrow meaning, which would require a longitudinal study of the eradication of errors. There are, however, some valuable

insights to be derived from studies employing the second meaning. These will be briefly summarized in order to venture some solutions regarding effective correction types.

Some solutions

Hendrickson (1978) cites a study by Robbins which experimented with weekly error explanations (apparently from writing errors) for a group of ESL learners for one trimester. They were to correct their errors and provide explanations for them. Yet this group did not reduce their verb errors over the period of the study. Brock, Crookes, Day and Long (1986) studied the effect of feedback in conversational interactions using NS-NNS conversation data (Chun, et al. 1982, see above), and found no differential effect for feedback which was judged to be explicit from that judged implicit.

Given findings such as these, it would seem the reply to the question "how should errors be corrected?" is: "don't bother." Yet there is some evidence of feedback on error resulting in learners' ability to correct. In addition to his proposals for instructional exercises intended to reduce errors, Fanselow (1977) argues for greater "redundancy, contrasts and explicit information in" teachers' feedback, isolation of the error, delaying the feedback, and various other suggestions. In Chaudron's French immersion study (1977a), some of these notions were tested by comparing the effects of different types of repetitions -- simple repetitions versus those with emphasis, or reduction or expansion of the learners' errors. (See Table 2.) Chaudron found an advantage for repetitions of student errors

with emphasis (either questioning tone or stress) or reduction to result in correct student responses, and the combination of these modifications was still more successful. Reduction of the learner's utterance to isolate the item in error increased student correct responses by about 15 percentage points (from 20% to 35%, and 42% to 59%), while adding emphasis increased correct responses by over 20 percentage points (from 20% to 42%, and from 35% to 59%). It would appear that some localization of the error and clear, explicit provision of an alternative model can at least result in immediate learner revision of the error.

Two other studies found that teacher treatment aided learners in supplying correct responses. Although she did not quantify the differences, Salica (1981) found the ESL students in her subjects' classes supplied correct responses to 64% of teacher corrective treatments. And Wren (1982), who had tutorial conversations with one of her own advanced ESL students, found the learner able to correct 83% of her utterances after Wren treated the errors, as opposed to only a 14% rate of self-correction.

Still, these studies risk being accused of discovering only immediate effects that result from learners who are good parrots. This would be a legitimate criticism if it weren't for the sort of differential effects revealed in Chaudron (1977a), suggesting that some conditions can promote better parroting. Furthermore, another differential effect was found in Crookes and Rulon's (1985) study of experimental NS-NNS conversations. Crookes and Rulon analyzed the amount of correcting feedback provided by the

NS in 16 dyads performing three tasks -- a free conversation, and two information exchange games. Crookes and Rulon hypothesized first, that the game tasks would generate more feedback and negotiation than the free conversation, and secondly, that the NNS would incorporate (repeat, reuse in later contexts) the NS feedback more in the information exchange games. The first hypothesis proved true, with the game tasks resulting in 4-5 times as many NS feedback utterances per NNS errorful utterance as the conversation: the need for communication overrode the natural rule of non-correction. The second hypothesis was only partly true; only one of the games resulted in significantly more instances of incorporation of NS feedback in the NNSs' utterances. The researchers speculate that this occurred principally because of the greater unfamiliar lexical material in this task, so that the NNS was able to acquire a number of new words during the game. This speculation is in accord with unquantified observations made by Bruton and Samuda (1980) in classroom group problem-solving discussions among adult ESL learners, and by several other NS-NNS conversational interaction studies, which found lexical difficulties and collaborative lexical search to be the most readily entered-upon negotiations (Gaskill 1980, Schwartz 1980, Brock, et al. 1986).

Although this last finding supports the potential effectiveness of certain types of corrective feedback, the primary conclusion to be drawn from it may be that learners will most readily incorporate corrective feedback when they are engaged in meaningful collaborative tasks. Appropriate use of the TL in these situations is necessary for success in meeting the

goals of the activity. This is of course a major foundation stone of communicative language teaching, although research has not verified the advantages of this approach for second language acquisition.

5. Who should correct learners' errors?

The apparent possible answers to this question are: the teacher, the learner making the error, or other learners. We have already seen what the teacher might do or fail to do in correcting errors. Depending on the importance or likely success of the error correction, the teacher must be as consistent and thorough as possible, and follow through with a correction until the learner evidences understanding of the error problem.

Otherwise, it may be more appropriate to allow the learner to self-correct. Certainly it should be the goal of instruction to improve learners' ability to monitor their own TL speech. Wren's (1982) advanced student managed self-correction for 14% of her errors, and for another 29% of her errors she invited Wren's assistance for either confirmation or help in correcting. So besides explicit grammar instruction to improve monitoring, it may be appropriate to train learners in the particular communication strategies that are useful for appeals for assistance. Fanselow (1977) found teachers' treatments of error involving only the indication of error to occur for about 1% of the errors, but students' self-correction occurred for almost 4%. More extensive research has yet to be conducted to determine the extent of learner self-correction possible if teachers wait before providing treatment, or merely indicate the fact of error.

Hendrickson's (1978) conclusion to this question cites several studies of composition correction to suggest that NNS peers may be very effective correctors of one another's writing. Although there are no studies comparing success of NNS peer correction and teacher correction in oral work, several studies of classrooms and experimental conversations, some of which have just been mentioned, demonstrate that NNS peers will provide substantial amounts of feedback and other negotiation of meaning in interaction with one another. This research is reviewed by Long and Porter (1985), from which the following summary deserves quotation:

Correction. The frequency of other-correction and completions by students is higher in group work than in lockstep teaching (Pica and Doughty 1985) and is not significantly different with NS and NNS interlocutors in small-group work, being very low in both contexts (Porter 1986). There seems to be considerable individual variability in the amount of attention students pay to their own and others' speech (Gaies 1983, Morrison and Low 1983), however, and some indication that training students to correct each other can help remedy this (Bruton and Samuda 1980). During group work, learners seem more apt to repair lexical errors, whereas teachers pay an equal amount of attention to errors of syntax and pronunciation (Bruton and Samuda 1980). Learners almost never miscorrect during unsupervised group work (Bruton and Samuda 1980, Porter 1986). [Long and Porter 1985:222]

Several of these points are rather important, because the intuitive judgment would be that NNSs would not provide enough correction or would provide incorrect feedback. This belief is not supported by the studies just cited, for although Porter (1986) found NSs correcting grammatical and lexical errors more frequently than NNSs, the overall frequency was low in both cases (8% and 1.5%, respectively) and only one fifth of the low number

of NNSs corrections were erroneous. Porter also found that other negotiation of meaning (termed "repair" and including clarification requests, confirmation checks, and similar negotiating acts, but not corrections) was practiced equally frequently by the NNSs and the NSs in the study. In a classroom study, Pica and Doughty (1985) also found that learners produced no more correct TL utterances in teacher-led activities than in a peer group activity.

These studies give reason to enlist greater learner involvement in correction of one another, although it is clear in the above studies (as in Crookes and Rulon 1985) that the particular group task employed will influence the amount of negotiation -- tasks involving exchange of information from both learners necessitate more negotiation. Yet it is evident that NSs, and presumably trained teachers, will be more alert to particular TL problems besides lexical ones or general miscommunication, and their provision of feedback could appreciably aid learners' attention to the problems. Unfortunately, the evidence for such additional success of teacher correction is not available.

Written error correction

So far, we have sketched the current status of research on oral error correction in classrooms. The quantity of research on error correction in writing is, although limited, rapidly expanding and in many respects more controlled and practical in its applications than work on oral error correction. In most respects, as Hendrickson (1978) emphasized, the theoretical

issues and implications are similar to those for oral feedback, to the extent that the research can be more briefly summarized according to the same five questions.

The historical and theoretical issues in teachers' provision of feedback on L2 learners' writing differ from those regarding oral errors principally with respect to the greater emphasis on detailed and explicit error correction on written work. The nature of a written record affords both teacher and learner a greater amount of time to localize errors and interpret their source and rectification. As a result, the traditional approach to feedback on writing has entailed time-consuming teacher correction and evaluation. However, parallel with the greater attention to communicative use of oral language in the past decade, but developing from independent theoretical sources, the teaching of native and second language writing has increasingly emphasized the process of writing. This emphasis has led to a lessening of concern among teachers for the formal end-product of writing, and a focus on the stages of the composing process, especially pre-writing (e.g. goal-setting, idea-generation) and revision. (For more detail on this historical development, cf. Hairston 1982, Zamel 1976, 1982, Lapp 1984.) The revision process activates learners either alone or in collaboration with their readers in the process of evaluating writing drafts as to their communicative adequacy.

Whereas the traditional model of teaching writing assumed that learners will develop TL norms by receiving final evaluations and corrections from the teacher, the process model

counts the revision stage as a critical one. It is probably while practicing revision that L2 learners begin to refine their intuitions. They are required to respond to their own or others' feedback about the communicative effectiveness of the draft, and in doing so they discover that good writing consists of an interaction between their ideas, the expression of the ideas, and their readers' perceptions and reactions to the expression. Such is the credo of the process-oriented researcher, yet it requires concrete research on the matter to justify this position.

1. Should learner errors be corrected?

The answer to the initial question, therefore, of whether learners' errors should be corrected is no different than it was in the case of oral error correction: it depends in part on the learner's preference, but also on whether or not correction aids improvement on the area of difficulty. In regard to the former question, Chaudron (1984) conducted a study of university L2 writers' attitudes toward having a teacher or other NS read their compositions for errors, in which he found that they did prefer such treatment. Aside from a further finding in this study concerning different sources of feedback, which will be mentioned in response to Question 5, we know of no research which deals more specifically with preferences for various forms of feedback. We will address the question of feedback effectiveness in response to Question 4.

2. When should learner errors be corrected?

The response to this question is again similar to that for oral correction, where arguments about which errors should be

corrected, and how, are the critical issue. The nature of written production allows the teacher to intervene whenever it might be appropriate, because errors in writing are not as transitory as errors in speech. The assumption of most current practitioners is of course to provide feedback first on global problems of meaning and coherence in writing, and only subsequently to attend to problems of surface form -- spelling, punctuation, grammatical points, and so on. The historical tradition may be the opposite. This applies whether or not feedback is provided during an early draft or at later stages of writing and re-writing.

3. Which learner errors should be corrected?

Unlike the case of little clear research on oral error correction, there are a few studies of L2 learners' improvement in writing following error correction in which the type of error was analyzed. The results of these studies are necessarily only interpretable with respect to the sort of error correction treatment provided, so we will turn to this fourth question first, and in the elaboration on the studies, it will be clear which sorts of errors were most amenable to rectification by correction.

4. How should learner errors be corrected?

Cumming (in press) lists the following primary possibilities for procedures which can be used in "responding" to student writing (see also the extensive L1 literature on this subject, e.g. Searle and Dillon 1980, Knoblauch and Brannon 1981, Griffen

1982, Sommers 1982); to these we have added several comments and sub-divisions:

- A. Evaluation (e.g. holistic rating or grading, or grading by specific category)
- B. Error identification
 - 1. Localization of error
 - 2. Categorization of error
- C. Teacher correction (e.g. overstrike and writing of "correct" form)
- D. Marginal commentary
- E. Checklisting (a technique involving a series of questions or areas to be evaluated by the writer)
- F. Oral responses
- G. Direct instruction
- H. Reformulation (a technique requiring a NS to re-write a draft while maintaining the same ideas as the original)
- I. Peer responses [adapted from Cumming in press]

The most conventional technique, type C, in which the teacher corrects the learners' errors, is the one most investigated, sometimes in conjunction with types A, B, D, and I. A study of student revisions on essays receiving this treatment (Fathman and Whalley 1985) found a significant degree of improvement in total error count, compared with student self-revisions. This should not be surprising, since the student has merely to copy the teacher's remarks. But three longitudinal studies of learners' improvement in compositions also showed that students who received teacher correction improved in the quality of their writing. This was true in a nine-week study by Hendrickson (1977), using a pre-test post-test design, but the

effect held whether the teacher corrected all errors, or only errors of grammar and lexical choice. Fathman and Whalley (1985) also compared a feedback treatment group with a no feedback group on improvement on an essay which had been revised once based on teacher corrections, and then was revised a second time after a two-week delay. They found the feedback group improved more than the no feedback group after the delay. Their evaluation was solely based on frequency of presumably grammatical errors. Finally, Robb, Ross, and Shortreed (1985) did a year-long study of Japanese EFL learners' improvement on test compositions following several error treatments (teacher correction, localization, localization plus categorization, and marginal comments). They found some evidence of longitudinal benefits of teacher corrections over just marginal comments, although other teacher treatments achieved similar results, and the result was most evident again on a measure of (grammatical) errors.

As for other teacher treatment procedures, both Fathman and Whalley (1985) and Robb, et al. (1985) compared teacher correction with localization only or localization plus categorization of type of error (B1 and 2). In both cases, these other two procedures appeared to be equally effective, although the localization plus categorization group in Robb, et al. (1985) appeared to increase in the frequency of errors on their test essays later in the year, and a marginal comments group (type D) appeared to catch up. Finally, Cardelle and Corno (1981) compared the effects of corrections (it is not clear whether these were by the students' teachers or by the experimenters) on

university L2 Spanish students' improvement in writing over a six week period. A treatment condition involving criticism on errors (apparently localization and categorization of errors) and praise on good writing proved superior to other conditions, especially those involving praise only and no feedback.

These results are both encouraging and discouraging with respect to the usefulness of written error correction. The encouraging side is that L2 learners appear to benefit, both on immediate revision and over longer periods, from feedback on their compositions, and this effect appears to be equivalent whether teachers take the time to provide a correction or just to localize errors. Marginal remarks alone may in fact result in equivalent improvement in the long run, although obviously more studies with comparisons among treatments are called for. The discouraging outcome is that the evidence from these studies relates primarily to measures of improvement on counts of surface errors, and not on other more global evaluation criteria. As we will shortly see, teachers may not be superior to other sources of error feedback as influences on improvement in other aspects of L2 composition.

5. Who should correct learner errors?

For the same reasons as was the case with oral errors, a strong argument can be made in favor of greater use of peer correction as a source of feedback to L2 learners. In addition to a growing body of support in native language composition instruction (Karengianes, Pascarella, and Pflaum 1980, Clifford 1981), this issue has been studied several times in L2 research

(Partridge 1981, Chaudron 1984, Zhang 1985), with results demonstrating an equally effective use of peer and teacher comments for revision of compositions. For example, Chaudron (1984) evaluated intermediate and advanced university ESL students' essays with a composition evaluation scale that differentiated between content, organization, mechanical, grammatical and vocabulary scores (Jacobs, Zingraf, Wormuth, Hartfie and Hughey 1981). Then, after providing the writers with feedback on their essays either from the teacher (B1 and 2: localization and categorization feedback), or from their peers (type I; the peers followed a checklist), the revisions were again evaluated, and improvement on revision was compared between treatment groups. The results showed that the peer and teacher feedback groups were not different in improvement. Zhang (1985) found identical results with ESL learners when using a similar procedure and adding a self-feedback treatment. None of the treatments resulted in superior revisions, except on a detailed count of errors per T-unit (a more stringent measure than the holistic one used by Chaudron), which showed teacher feedback superior to self-feedback.

Just as in the case of oral error correction, this sort of evidence, then, speaks strongly in favor of the use of peers to provide feedback to one another as to the quality of their writing. Procedures for doing so have been developed with success (Witbeck 1976, Chaudron 1984), and once learners get over the initial awkwardness of asserting their own intuitions as to correctness, they appear to develop quickly as judges of their

peers' and their own writing. To suggest that peers provide feedback is not to propose, however, that the teacher can simply withdraw from further engagement with learners' productive difficulties. The use of peer feedback can simply free up a portion of the teacher's time that would otherwise be devoted to lengthy comments and underlinings on students' papers.

Conclusion

Feedback in L2 classrooms lies at the core of research on teacher-student and student-student interaction in the classroom, exemplifying both the inherent danger in assuming that learning is occurring because the teacher is performing an instructional act ("correcting"), and the potential benefit that learners may derive from the appropriate sort of information or opportunity to monitor their TL speech and interact with one another to improve their competence.

The research reviewed here has suggested that error correction does not constitute a major proportion of the activity in L2 classrooms which have a focus on communicative activities such as subject matter instruction, and that communicative interaction in group work may provide as much appropriate corrective feedback to learners as teacher-fronted classroom tasks. Regrettably, however, the critical research has yet to be conducted which would determine the extent of learning possible from feedback, or the types of feedback that would best succeed in promoting TL progress. In closing, we must urge that further research be conducted on oral and written error feedback. There

is definite evidence of potential effects on L2 learners' progress, but future research will have to carefully distinguish among error treatments and measure the learners' TL production over time, in order for us to be assured that the results in fact stem from the treatments rather than from natural developmental tendencies.

Notes

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1. Several other studies do not provide enough information about the error treatments to determine whether "model," "gives correct response orally," or "gives part of correct response" (very common treatments in these studies) are in fact repetitions of the learners' utterances.

2. We will omit the now archaic sense of correction meaning only positive or negative evaluation - praise or reproof.

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