Acquiring Grammatical Structures by Guided Induction

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Researchers are now confirming what most foreign language teachers have believed for years: the acquisition of certain grammatical structures can benefit from formal instruction (see Chaudron; Lightbown and Spada; Long; Rutherford and Sharwood Smith for review). Lightbown and Spada categorize this focus-on-form by the teacher as either “instructional” (the teacher presents a linguistic structure and leads the students in practice exercises) or “reactive” (the teacher reacts to an apparent difficulty a student is having during a communicative activity) (436). Within the “instructional” format, controversy still surrounds the issue of what is the most effective approach for presenting a new grammatical pattern in the classroom.

Currently, Omaggio and Rivers in their methods books favor an inductive presentation in which students are encouraged to develop rules from authentic linguistic samples and then to practice applying these rules in communicative exercises. Many foreign language teachers and textbooks, however, still adhere to a deductive presentation. In this approach the instructor explains a grammatical rule first and then directs the class in contextualized exercises which practice application of the rule (or, the students may read about the rule in a textbook and complete accompanying exercises to practice application). This approach is deductive in the sense that the grammar lesson progresses from the general (the rule) to particulars (examples in a drill).

Although far from definitive, the majority of empirical research comparing inductive and deductive approaches suggests that the deductive approach may be slightly more effective (e.g., Chastain and Woerdehoff; Chastain; Scherer and Wertheimer; Seliger; see Hammerly for a discussion of the controversy). From our point of view, the problem with this research is in the way the inductive approach is conceptualized. In all of the studies cited above the only difference between deductive and inductive approaches was in whether the rule was explicitly stated by the teacher before or after the examples. With regard to learning the rule, therefore, the student plays a passive role in both of these presentations. This passivity on the part of the student runs contrary to findings of cognitive psychologists and researchers who stress that language learners need to be actively engaged in their learning, and that this learning need not involve
presentation of metalinguistic information or rules (cf. Rutherford and Sharwood Smith 107–16).

More consistent with current views of hypothesis testing in second language research is a Guided Induction approach in which the learner takes an active role (e.g., Tomasello and Herron; see Herron for a review). In this approach, the grammar lesson begins with a contextualized oral question/answer exercise. Upon completion of the oral activity, the teacher directs the students' attention to the board where they are invited to complete a novel sentence in which the target structure has been deleted; the teacher then provides immediate feedback about their attempt. At no time does either teacher or student explicitly state the rule. The presumption is that the students are forming a hypothesis about the underlying regularity involved throughout the oral activity and thus discovering by themselves how a particular grammatical pattern works, with only indirect guidance from the teacher. New examples give them the opportunity to test their speculations. The immediate feedback serves to solidify further their understanding of the structure.

The Guided Inductive approach has never been directly compared empirically to the traditional deductive presentation. The only study of which we are aware that makes a comparison resembling this is by Shaffer (cf. also Sjöberg and Tropé). She compared the deductive approach with an inductive one in which the students discover the rule after presentation of written examples. She found no significant differences between the two approaches (on some measures there was a nonsignificant trend in favor of her modified inductive approach).

Shaffer's results are problematic, however, because of several very basic design flaws. First, the students were not randomly assigned to conditions; individual teachers in the classrooms chose which students participated in which learning condition. Second, students in the inductive condition were given more examples than those in the deductive condition (20 to 6 in the example in the appendix). Any differences in the two conditions might thus be due to the different numbers of examples involved. Finally, any student in the inductive condition who could not verbalize the rule before taking a test on it was eliminated from analysis; no students from the deductive condition were eliminated. Assuming that weaker students are more likely to fail at stating the rule, this selectively eliminated weaker students from the inductive condition.

We should stress therefore that Shaffer's inductive method was not the same as ours. Her students explicitly stated the rule at the end of her examples. Moreover, she chose a written format which, in our view, effectively vitiates the whole process as students may study the rule and examples (perhaps after they have written their rule) by shifting their attention from the rule to the examples in whatever order they wish. In our Guided Induction approach it is crucial that students receive oral examples first,
and that they induce the rule implicitly and not be forced to explicate it into an English formalism.

In the current study we attempted to compare our Guided Induction approach to a traditional deductive approach. We did this by comparing the learning of French grammatical structures by beginning level American college students in two teaching conditions.

**Deduction.** The teacher begins by stating the rule and illustrates it with a written model on the board. Students then practice applying the rule in a contextualized oral drill.

**Guided Induction.** The teacher begins with the contextualized oral drill so that the students can induce for themselves the underlying grammatical pattern. The teacher then focuses the students' attention on the principal features of the pattern by asking them to complete a model sentence on the board with a structure analogous to the ones practiced orally. This completion activity acts as feedback to the students on the accuracy of their linguistic hypotheses.

**Method**

**Subjects**

Subjects for the study were 26 students (13 males, 13 females) enrolled in two sections of a semester-long, beginning-level French 101 course at Emory University in the spring of 1990. Of these students 17 students had never studied French before; 6 students had studied French for 1 year or less; and 3 students had 2 years of previous exposure to French in high school. Six students were freshman; 7 were sophomores; 11 were juniors; 1 was a senior; and 1 was a graduate student. The two class sections were composed in the usual way by the university registrar. The two groups were roughly equivalent with respect to the age and gender mix of the students and previous experience in French. The "within subjects" empirical design, described below, was completely counterbalanced.

**General Classroom Procedures**

The course was taught in French using *French in Action*, a video/audio program by Pierre Capretz. This communicative approach allows students to hear authentic French speech as they observe native speakers interacting in French cultural situations. All instructional activities are meaning-based and revolve around a continuing mystery story. Opportunities are provided for students to practice negotiating meaning in small group activities. Classroom activities on Friday consisted of the students watching the new video story for the next week's lesson and answering oral comprehension questions with the teacher. They also took a short, fifteen-minute written quiz on that week's work. On Mondays, the teacher engaged the students
in contextualized linguistic exercises and open-ended activities designed to review and reinforce structures. Also, the students watched a twenty-minute video selection in which Capretz highlights the principal features of the lesson. On Wednesdays, the teacher reviewed the work the students had completed in the language laboratory and engaged students in communicative activities such as role-playing and presenting original dialogues modeled after that week's video story. Students spent three hours per week with the teacher and approximately one and a half hours per week in the language laboratory listening to tapes and re-viewing the video. Both teachers were non-native speakers of French with previous experience teaching beginning-level college French.

**Target Structures**

Ten grammatical structures in French were chosen from the student's grammar/language laboratory manual. In the order they appear in the text (also the order in which they were taught), these were:

1) *au*—contraction of *à + le* used as a preposition.
2) *des*—plural indefinite article.
3) *pouvoir (to be able to, can) + infinitif*.
4) *ne (verbe) pas de*—replacement of *un(e)* by *de* after certain negated verbs.
5) *plus (moins) + adjectif + que*—comparative.
6) *du/de la/de l'*—partitive article.
7) *jouer + à*—use of the preposition *à* when referring to playing a game.
8) *Je le(la)x(fes) connais*—position and form of the direct object pronoun.
9) *Couchez-vous! Ne vous couchez pas!*—formation of the imperative with an accompanying pronoun.
10) *lequel, laquelle, lesquels, lesquelles*—interrogative pronoun.

The first of the ten structures was randomly assigned to either the Guided Induction or Deduction condition for one class section. That structure was then assigned to the opposite condition for the other class section. From that point on, assignment of structures to conditions alternated for both classes, so that each class had a total of five structures in each condition. The two classes were, in fact, mirror images of one another—if a particular structure was taught in one condition in one class, it was taught in the opposite condition in the other. When summed across subjects and structures, therefore, the results were perfectly counterbalanced: each subject and each structure was equally represented in the two conditions. This completely counterbalanced design also controlled for the potential confounds of no random assignment and a different teacher in each class.

**Teaching Procedure**

For both sections, structures were taught approximately one week apart, in the order that they appeared in the workbook. The teacher presented
each structure on Wednesday, one class day before the student met the
structure in the video lesson for the week. The grammatical structure was
thus a new one for all students in the current classroom setting. While no
monitoring took place of teacher presentations in the two classrooms, both
teachers received a script of how to present the targeted structure and
were asked to follow it verbatim. For all structures in both conditions the
teaching procedure consisted of two parts: 1) an oral practice drill, and 2) a
model sentence on the board that illustrated usage of the target structure.
These were both identical in the two conditions.

In the Deduction condition, the teacher began the lesson by pointing to a
model sentence on the board that exemplified the rule. She then read the
model sentence aloud and gave a brief grammatical explanation. The model
sentence always referred to a topic covered in that week’s video. The
example which follows comes from lesson 4 (target structure number 3) in
which a young American arrives by plane in Paris.

*Model sentence written on board:*
TEACHER: Dans un avion, on peut parler à un ami; on ne peut pas regarder un
match de football.

*Oral rule statement:*
TEACHER: En français, utilisez l’infinitif après le verbe pouvoir.

After this explanation, the teacher practiced correct usage with the stu-
dents by leading them in a ten-item, contextualized oral drill accompanied
by flashcards to reinforce meaning:

*Instructions:* Cet exercice s’appelle *Dans un avion.* Répondez affirmativement ou
négativement à ma question:
1) TEACHER (picture of people drinking): Dans un avion, peut-on boire?
   STUDENTS: Oui, on peut boire.
2) TEACHER (picture of people dancing): Peut-on danser?
   STUDENTS: Non, on ne peut pas danser.
3) TEACHER (picture of people jogging): Peut-on faire du jogging?
   STUDENTS: Non, on ne peut pas faire de jogging.
4) TEACHER (picture of people eating): Peut-on manger?
   STUDENTS: Oui, on peut manger.

The drill continued with six more analogous items.

In the Guided Induction Condition, the teacher began the lesson by
introducing the topic of the exercise (*Dans l’avion*) and then led the students
in the same ten-item drill described above. Upon completion of the oral
activity, she directed their attention to the model sentence on the board and
asked them to fill in the blanks chorally as a group.

*Instructions:* Maintenant répondez avec imagination.
TEACHER: Dans un avion, on peut ______ à un ami; on ne peut pas ______ un
match de football.
STUDENTS: parler/regarder (at the time of the blanks)

The teacher wrote in the students’ choral response as they gave it. As
expected, all students responded with the same infinitives (choice was very
limited due to their low level of linguistic development). The teacher neither gave nor requested from students any explanation or formulation of a grammatical rule. Each of the ten target structures was taught in this basic way with particular examples adapted to particular structures.

Testing Procedures

Target structures were formally tested on a written quiz two times in a fill-in-the-blank format (e.g. Au cinéma, on peut ________.). On each of the two multi-item, multi-section tests covering a variety of material other than that of current interest, the target structure was tested with one item only; each subject thus received either a 1 or a 0 on each item. Test I fell one class day after the structure was taught (but before any further presentation of the structure). Test II was given one week after the structure was taught (no in-class instruction of the targeted structure occurred between Test I and Test II). Each structure was tested twice because of some findings that deductive and inductive approaches have different effects on student retention (cf. Craig; Kittell; Selliger; Sjöberg and Tropé).

Results

Figure 1 presents for each of the ten structures the percentage of students who answered the target question correctly. It is important to point out that the comparison in the case of any one structure is not wholly valid because its teaching in the two conditions was done by two different teachers. The appropriate comparisons can only be made across all structures, which takes advantage of the counterbalanced design. For purposes of statistical analysis, each student received two scores for each of the two tests. One score was the percent correct in the Deduction condition and the other score represented the percent correct in the Guided Induction condition. If a student missed class on either the day a structure was introduced or the day it was tested, that structure was not counted. Thus, for example, a student who answered correctly 4 of 5 questions in the Deduction Condition received a score of 80%; if that student missed a class in the Guided Induction condition and answered correctly 3 of the 4 questions about the remaining structures, she received a score of 75%. (One subject missed either the presentation or test for all five structures in one condition for Test I and so was excluded from all analyses of Test I).

Mean proportions for the two conditions on the two tests are presented in Figure 2. Two tests were performed: one for Test I and one for Test II. For each of the two written evaluations, results favored the Guided Inductive condition. For Test I, t(23) = 2.23, p < .05; for Test II, t(24) = 2.27, p < .05 (all probabilities two-tailed).

Discussion

The results of the current study suggest that a Guided Induction presentation is superior to a Deductive one for the teaching of certain grammati-
Figure 1.
Proportion of Students with Correct Answers for Each Structure as a Function of Teaching Condition and Test

Test I

Test II
cal structures to beginning foreign language students. This effect was apparent on written tests both immediately after the teaching, and it continued for the next week. The effect was particularly strong in the immediate test where nine out of ten target structures were learned better in the Guided Induction condition.

Previous research that has shown a superiority for Deductive methods has invariably used an Inductive method that did not emphasize active hypothesis testing on the part of students (see Chaudron for a review). Our results are thus not in conflict with these, but complement them. Blind drills, either inductive or deductive, are of limited usefulness; drills encouraging active cognitive processing in meaningful contexts are much more useful. It is also important to compare the current findings to those of Shaffer in which students were led to discover the rule in the inductive condition. Since the two major confounds in her study (number of examples in the drill and selecting out poorer students) both favored the Inductive group, it is curious in light of the current findings that she did not find a superiority for her modified Inductive group. We believe it was because she used a written format, and this tended to minimize active hypothesis-testing in the Induction condition. Thus, never in her version of Induction did students test a hypothesis in a novel context and receive immediate feedback, as they did in our model sentence.
We would like to argue that both of the learning conditions in the current study are cognitively based. The Deduction condition gives the students the rule before the examples to use as an advanced organizer (Ausubel). But the Guided Induction condition is also cognitive in the sense that students are forming hypotheses in the oral examples, which they then test in the model sentence; this of course accords with the hypothesis-testing view of cognitive theorists such as Selinker and Corder. Moreover, we would like to argue that the Guided Induction presentation involves more active learning than the Deductive one in the sense that students are actively forming the hypotheses for themselves. Being given the rule, either before or after oral practice, does not engage the students cognitively to nearly the same degree.

The current results thus conform to studies on first language acquisition (e.g., Nelson; Tomasello) and our previous research in second language learning showing the positive effect of active hypothesis-testing on student learning. We maintain that students learn best when they produce a hypothesis and receive immediate feedback because this creates maximal conditions under which they may cognitively compare their own developing system to that of mature speakers. For example, we have found that cognitive comparison was facilitated by using a “garden path” technique for teaching grammatical exceptions (i.e., inducing students to make a mistake and then immediately correcting it) (Tomasello and Herron, “Down”; Tomasello and Herron, “Feedback”). Also, our research indicates that students learned grammatical structures better when they were given immediate teacher feedback than they did when they were given a variety of examples without feedback (Herron and Tomasello).

The findings of this study have obvious classroom application. Foreign language teachers have often adopted the procedure of introducing grammar deductively; after all, it is probably easier to present a grammatical structure deductively than inductively. In a deductive approach, the teacher summarizes a rule, gives a few examples, and then engages students in a practice activity, usually taken from the textbook. When presenting a structure inductively, the teacher must engage students in a meaningful exercise constructed to insure that students perceive the underlying pattern and learn from analogy. Sometimes such an activity can be found in the students’ text, but often not. Most textbook exercises reinforce grammar rather than teach it.

Moreover, beginning every lesson with a rule may deprive students of the opportunity to develop their own powers of linguistic observation and construction. We have shown that a more active inductive approach provides such an opportunity. It would therefore seem important that curricular materials be developed to assist teachers in presenting material to students in a way that engages their hypothesis-testing procedures.

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Works Cited


