When Jell-O meets generative grammar: Linguistics in the fifth-grade English classroom

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0. Introduction. Proposals have been made for "doing linguistics" in the schools in order to promote critical inquiry about language; some have been implemented:
- at the elementary level (e.g., Fabb 1985; Goodluck 1991; Keyser 1970; Wolfram 1997)
- at the secondary level (e.g., Chomsky et al. 1985; Honda 1994)

Common to all of these projects is the fact that linguists have initiated them. In contrast, for the past four years, at the invitation of David Pippin, the three of us have worked together at Seattle Country Day School to introduce problem-set-based linguistics into his fifth-grade classes as part of the English curriculum.

Our question:

What can a fifth-grade English teacher effectively use of what the linguist knows and does?

In this paper, we present evidence:

1. that <u>the linguist's approach</u> to investigating the implicit rules (the "surprise") of language is valuable in the English classroom because it interests students in the structure of language and actively involves them in discovering the regularity beneath its seeming messiness;

2. that from the teacher's point of view, students' metalinguistic awareness motivates them to learn <u>the teacher's language</u> for talking about language. This is valuable because students are learning to manipulate language in different oral and written contexts—a primary goal of the elementary English curriculum.

1. Background. Seattle Country Day School is a K-8 independent school. Beginning in the fourth grade, students travel to specialist teachers for all of their classes. Inquiry-based teaching and learning is a hallmark of the school, as exemplified by its renowned laboratory science program. Thus students at the school are used to engaging in empirical inquiry.

The study of English and foreign languages, however, is not traditionally associated with the investigation and explanation of data at Seattle Country Day, or at any other elementary or secondary school. Instead of theory building based in data, students of language are typically engaged in group discussion of literature, written response to teacher prompts, grammar mini-lessons, and independent writing. In contrast to this focus on E-language—language as an object external to the mind, some linguists have promoted the study of I-language, or mental grammar, in the schools (e.g., Chomsky et al. 1985; Honda & O'Neil 1993; Honda 1994). Our work follows from Pippin's decision to expand his fifth-grade English curriculum to include the collaborative investigation of I-language: examining data, formulating hypotheses to account for the data, and testing them against counterexamples.[1]

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[1] The innovation of doing linguistics in this way does not require an elite independent school setting, for Honda and O'Neil's previous work in public schools has been as successful as our work at Seattle Country Day (see Honda 1994). However, the new pressure of high stakes tests now severely constrains innovative educational practice in all parts of the public school curriculum.

2. Preconceptions about grammar. Seattle Country Day students start the fifth grade with only a naive understanding of rules of grammar, Universal, language-particular, or prescriptive, as one can see from their reflections on the following quote from a story by Roald Dahl (2000: 5):

"English grammar is governed by rules that are almost mathematical in their strictness."[2]

- I disagree… Someone may put up a fight about [the rule that requires] a verb in a sentence. No! You don't [have to have a verb]. *I am a cat with long horns.* Does that have a verb in it? Noooo!

- verb + noun = sentence; 5 + 5 =10… I ran quickly (verb) across the street (noun).

- English has many rules, but does not follow them as much as say German.

- I agree. If you spell something wrong in English class, it won't be the right word no matter how hard you try.

- I think this statement is true. Rules of grammar can't be changed. If they did, there would be no proper sentences, and no one would ever really know what one was writing down.

- I agree with this because "Me am pretty" is not correct grammar. You should say "I am pretty" to be correct.

3. The curriculum. "Serious inquiry begins when we are willing to be surprised by simple phenomena of nature, such as the fact that an apple falls from a tree, or a phrase means what it does" (Chomsky 1993: 25). The curriculum we have implemented is designed to promote inquiry by taking advantage of students' willingness to be surprised by simple phenomena of language.

3.1 Establishing a basic linguistic framework.

3.1.1 The Sentence Box and the Lexical Demolition Derby. Using a set of nested boxes and matchbox cars, we introduce students to how language works—a chunky bunch of words merging, converging, and crashing into each other. This notion of the phrasal structure of language is also strengthened by asking students to try to

"Rearrange these ten English words to make another grammatical sentence."

Most home in on one or two possibilities. Students, understanding the concept factorial, are surprised to see that this number contrasts dramatically with the total number of combinations possible without grammatical constraint. Further exploration of phrase structure occurs visually in Reed-Kellogg and syntactic tree diagramming of students' writing, and as they grow more sophisticated, through tests of constituency.

3.1.2 "Colorless green ideas." Rather than simply model Chomsky's syntactically fine sentence, students are asked to create sentences that violate phrase structure. It's a surprise for students to learn that they have a hard time meeting the challenge of speaking and writing a-syntactically. These conversations also help students discriminate syntax from semantics.

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[2] From The great automatic grammatizator, in The umbrella man and other stories. The quote and the idea of a machine that generates language make a great topic for discussion, but the story is written for a young adult audience.

Payoff for teacher and students: Discussion of phrase structure is certainly useful for the writing teacher—fifth-graders at Seattle Country Day are just beginning to learn about main clauses and other parts of a sentence, and these conversations support this learning—and also prepare students for the study of grammar as a worthy endeavor in its own right.

3.2 Investigating language through problem sets. This endeavor is the focus of a series of problem sets that tell a connected story about language—problems that students work on collaboratively.

3.2.1 New England /r/: /r/ retention and intrusion (*water is wet* vs. *watah seeped in*; *lawr of the sea* vs. *law from above*). To students, aware of regional varieties of English from popular culture and intrigued by different accents, New England /r/ has special appeal in the /r/-full Pacific Northwest. Defining the problem for themselves through recordings and connections to relatives in New England or England, students can't help but be surprised by the fact that /r/ changes "only in some cases."

This problem is a good one to start with because students can arrive at a reasoned explanation of the phenomena without knowing a lot of jargon and despite their naive understanding of grammar and theory building.

Payoff for teacher and students: Solving this problem opens the door to examining not only language variation but also the sound structure of English, allowing the teacher to initiate discussion of what's a vowel/consonant/glide and of the relationship between the spelling of English and its phonemes. Awareness of this relationship is also sharpened through a year-long project in which students hunt for all the phonemes in English and their associated spellings.

Other problem sets examine the morphophonology of English noun-plural and past-tense formation and Appalachian English /a/-prefixation, and the syntax of question formation and *wanna*-contraction.

3.2.2 *Wanna*-contraction. This problem set builds on question-formation problem sets drawn from Brazilian-Portuguese, English, Mandarin Chinese, and Tohono O'odham. The problem set on WH-question formation in English establishes the notion WH-trace—a "reserved parking space," as one student called it: reserved for the new information that answers a WH-question.
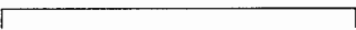
The *wanna*-contraction problem requires students to explain the surprising fact that you can't contract *want to* to *wanna* whenever you wanna; for example, although contraction is possible in (1), it is not in (2):

   (1) Where do you wanna go?

   (2) *Who do you wanna go?

Ideally, students' hypotheses are narrowed through discussion to one that focuses on the location of WH-trace in a set of English WH-questions containing *want to,* including:

   (3) Where do you want Emma to go?

Finally, the students come to the conclusion that you can't contract *want to* to *wanna* if anything falls between *want* and *to*: a WH-trace or a phrase like *Emma*, as illustrated in the hypothesis formulated by one girl:

        (4) Can use wanna   **Who** do you want to go with ^ ?

                                                  refrence point [=WH-trace]

                                    Anna
                                    You want to go with **who**?
                                    I want to go with **Anna**.

        Can't use wanna   #1 **Who** do you want **Emma** to go with ^?

                                            is between want and to
                                    Eric
                                    You want Emma to go with **who**?
                                  I want Emma to go with **Eric**.

                              #2 another way you wouldn't be able to say wanna is if the refrence point is between want and to.

4. Findings.

4.1 Responses to the problem sets. Students express a range of feelings:

- All in all I think these problem sets were boring.
- I am still having a little trouble, but I had lots of fun doing it.
- I haven't really understood the problem sets, they've gone by so fast and everyone else gets them...but I am still struggling to understand them.
- I have also learned that I can do something as long as I put my mind to it.
- They really streched my brain and encouraged me to not give up if I don't get the perfect hypothesis. They were also just really fun to do.

4.2 Responses to the "surprise" of language. The linguist's approach to investigating the "surprise" of language—of the vernacular, in particular—interests students in the structure of language. Consider the following student comments:

- The linguistics problem sets taught me to look more closely at the way people talk, and not just take it for granted.
- In all honesty linguistics problem sets aren't top on my list but I did learn that the way we speak is based on sound and not spelling.
- I have learned very interesting stuff about the unwritten rules of speaking English from the Linguistics problem sets. I find this extremely interesting because I never noticed any pattern of when I say "wanna" or /s/ instead of /z/ [in plural nouns].

- I learned the rules of many different English concepts, but I like the most recent one, [problem set] #3, the best. I like it mainly because it is just such an odd topic to be talking about in Writing Class! I mean, can you say wanna whenever you wanna?

4.3 Engaging students in linguistic inquiry. The surprise of language draws students into the inquiry process, organizing data and applying linguistic concepts in order to explain data. We see this in (5), one student's schematic presentation of her comparative analysis of English and Mandarin Chinese WH-question formation, unique among this year's fifth-graders:

(5) to form a WH-question in manderin chinese it works like this:
the order they say it / the order we say it

Q she want what	/	Q what does she want	/C goes to the beginning
A B C	/	C A B	
A she want bread	/	A she wants some bread	/doesn't change the order
A B C	/	A B C	

Other student comments highlight the payoff of <u>the linguist's approach</u>:

- From the linguestics problems sets I learned that every day things in life that we say can turn into a great problem to solve. I think it is usefull to learn it even if you won't use it. I also learned the right way to write a hypothesis.

- I also learned how to write a good, parsimonious hypothisis but most of all how to try and understand something that is comonly used in my daily life.

- The linguistics problem sets are great for not only getting a solution in whatever you are studying in the problem, but also the hypothesis…are unpredictable. These problems…will help me in my life as a linguist.

4.4 Case studies. Doing linguistics raises students' awareness about language. Furthermore, it motivates them to learn—and use—the teacher's language for talking about language, as illustrated by the following case studies.

4.4.1 Jimmy. In writing conferences with the teacher, Jimmy has made it clear that writing hasn't been his strong suit. Standardized test scores bear this out. And yet, Jimmy is often the first one to participate in conversations about grammar. While putting prepositional phrases into Reed-Kellogg diagrams, the class was struggling with the structure of the PP [preposition + OOP (object of the preposition)] and whether particular phrases act as adjectival or adverbial modifiers. (Students can't help paying attention when one starts talking about PP.) Jimmy, on the other hand, grasped the topic quickly and asked if there was anything that modified a whole sentence. Later on, this comment was the springboard to the concept of sentence mood and the question formation problem sets. In a parent conference in the fall, Jimmy's parents talked about how happy he was in English class this year. Indeed, his mother added with a touch of annoyance that he was clucking about Noam Chomsky being one of the world's most important linguists, and that she shouldn't forget it.

4.4.2 Doug. What follows is an example of a sentence that allowed students to show off their newfound knowledge of sentence structure. It was written and edited by Doug during daily writing workshop and first discussed with the teacher during an individual writing conference. *After about two hours he stopped at the top of the mountain to look at the view[,] and for some lunch.* Doug added the comma while editing the first draft. Without the comma, the reader is set up to read the words surrounding the conjunction as a two equal parts that complement the infinitive. But Doug did not want his character to be foraging, and adding that comma helped the reader make the adjustment. During a class conversation about this example, Jimmy wondered if we might use a constituency test to check on the affiliation of words. Another student thought it might be helpful to use a tree diagram to reveal the different meanings. Still another remarked, "There's a lot of hidden meaning in sentences." Doug is a student who, according to his mom, up till this year has always viewed himself as a scientist, someone who wants to pursue a career in ecology. Now he wants to be an English teacher.

5. Significance. There are certain students—like Jimmy and Doug—for whom linguistic study is necessary to trigger interest in an environment in which they have had little success or motivation. Through such inquiry, reluctant students of language come to appreciate the formal study of language by solving intriguing problem sets. The linguist's approach to language has tremendous appeal particularly to math/science types, who enjoy demonstrating their reasoning skills within the world of the language. For those who already meet with success in the language classroom, this type of inquiry can enhance their love of reading, writing, and speaking. And when students have access to other languages, either at home or at school, the excitement is contagious and often results in their wanting to talk about related phenomena in these languages.

At the end of the school year, most students will have forgotten the prescriptive or descriptive details of their study of English, but if we can leave them asking more questions about the world of languages around them, this is good.

What does Jell-O have to do with anything? Well, half of the linguists that have worked at Seattle Country Day School enjoy eating Jell-O from the school "cafetorium." It is not yet clear why this is so and if it's important.

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