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THE SEVERAL LOGICS OF QUANTIFICATION

William Labov

This report is one of a series of efforts to examine the semantics of grammatical elements in English, and to find out among other things why it is so difficult for us to write a clear and accurate description of a language.¹ The strategy that I and others have followed to answer such questions is to examine how people actually use the language, rather than how they think they use it, or should use it. I will be focussing in particular on the use of universal quantifiers in English: all, every, each and any.² An examination of these quantifiers in the language of every-day life shows that they are not governed in any consistent way by the logic of schoolroom grammar and scientific calculation (Labov 1984). The results support the view of those who suspect that our linguistic grammars have -- in spite of all our best efforts -- a strong prescriptive component (Fox and Geis 1984). The following inferences must be accepted in any introduction to logic (Copi 1982):

- (1) He did everything
 - => Given any individual thing whatever, he did it
 - => There does not exist anything that he did not do.
- (2) All of them caught hold of me
 - => Given any one of them, he caught hold of me.
 - => There was not any one of them who did not catch hold of me.
- (3) I was never still
 - => Given any time, I was not still
 - => There was not any time that I was still.

We will see that these inferences do not apply to (1-3) as they were spoken, and do not apply to a sizeable number of other sentences uttered in every-day life. Worse yet, for the majority of sentences that contain universal quantifiers, we have no way of knowing whether they apply or not.

In other studies of universal quantifiers -- particularly the rules that govern negative attraction and negative concord to the indeterminates any, ever and either, I examined alternate ways of saying the same thing (Labov 1972). In this investigation, I will be looking at the distribution of different meanings attached to the same forms. This might seem to be a less controlled operation, since the meanings people use must be influenced by what they are talking about, and in spontaneous speech -- even the formal section of an interview -- people talk about different things. One way of approaching the problem is to maximize it. In what follows, I will be comparing ordinary people talking about ordinary experience in private with important people talking about important subjects in public. I hope that the results will increase our understanding of the meanings of the universal quantifiers and the relation of logic to language.

1. The ordinary use of universal quantifiers

This section will illustrate the use of universal quantifiers in every-day speech, drawing from earlier analyses (Labov 1984). Two polar types of semantic interpretation are considered. The "strict interpretation" of any, each, all, every, and ever conforms to the traditional, proper or logical use: the quantifier is applied to a set to designate exhaustively all members of the set, with no exceptions. The "loose interpretation" of these quantifiers is applied to designate the members of the set as a whole, but not necessarily exhaustively. Exceptions are not excluded, so that the difference between 'all' and 'not all' is neutralized.

As listeners, we often do not know which of these two interpretations to make. In some contexts, the strict interpretation is most likely, while in others it is impossible. When universal quantifiers are applied to a set of known size, the strict interpretation is the most probable one.

(4) Now every one o' my kids turned back.

But in many every-day uses the strict interpretation must be ruled out by our knowledge of the facts of the matter:

(5) I left all my clothes down South.

Between these two extremes, there are a range of uses that

must be classified by the varying likelihood of a strict interpretation. One way of ordering these uses is to consider what objective evidence would be available to an observer who was on the scene at the referenced time and place. The following examples are drawn from a narrative of Jim Lynch, 64, an Irish-American resident of the Kensington neighborhood of North Philadelphia. Lynch represents the conservative speech pattern of older working-class Philadelphians. His use of the universal quantifiers is characteristic of the every-day speech that has been examined so far.³

Throughout his life, Lynch was known as a practical joker -- he was called "the Pest". The examples to follow are drawn from a story he told about the dirtiest trick he ever did. It was at a party held in mid-winter; there was snow on the ground. People were drinking a lot of beer; the women were using the upstairs bathroom, and the men were going out in the backyard. Lynch dressed up in a woman's hat and nightgown, and stationed himself out in the back yard. When the men came out, they thought they saw a woman out in the yard, and they went back in. After a while, people noticed quite a few men with wet pants legs, and someone figured out that Lynch was at work. They caught him and threw him into a snow bank.

None of the sets referred to are of known size. But some are easily denumerable.

- (6) So every time a fellow would come out in the side alley, I'd shuffle my feet and they could see that it was somebody with a hat on.

We don't know how many times this happened. But an observer on the scene would easily be able to count them and it seems most probable that Lynch did the same thing every time. The strict interpretation of every is favored. But in more cases the set is non-denumerable.

- (7) This party was in full swing, but all the women were going upstairs, and all the men were going outside, see.

No observer on the scene could tell if all the women went upstairs, or if all the men went out. We can infer that all the people who went outside were men, and that most of the people who went upstairs were women. But the interpretation of all as applied to the set of people at the party is undetermined.

Other uses of universal quantifiers are undetermined because they are applied to subjective states.

- (8) a. It never bothered me.
- b. That's the dirtiest trick I ever done.

There is no way for any external observer to know whether the statements applied in every instance that they might have applied.

We might decide to give the speaker the benefit of any doubt, and attribute the strict use of never and ever to these sentences, if it were not for the frequent occurrences of sentences like (9). These are obviously false if the strict interpretation of never, all, no and every is applied.

- (9) a. I'd never be still.
- b. They all caught hold of me.
- c. Now you don't have no neighbors.
- d. He did everything.
- e. We were no fat kids. There was only one fat boy in the neighborhood. We were all thin and wiry.

If we adhere to the strict interpretation of the universal quantifiers, we would be forced to label these utterances as 'false'. We might soften this interpretation by a pragmatic approach which considers them 'pardonable exaggeration'⁴. Or we may construct generalized implicit contexts for the universal quantifiers in conversation, such as 'apply to the set of all objects worth mentioning in this context.' (9a) might then be expanded to 'I'd never be still for any time worth mentioning', and (9c) to 'Now you don't have no neighbors worth mentioning'. Even with a term as expansive as 'worth mentioning', the number of pragmatic analyses needed expands rapidly as examples accumulate. (9b) can hardly be expanded in the same way; it must be understood as 'There were so many guys laying hold of me, it was as if everybody at the party laid hold of me'. (9d) seems to be expanded best as 'He did everything that had to be done', and (9e) can only be salvaged by re-interpreting the second sentence as applying to a different set: 'and even outside of our group, there was only one fat boy in the neighborhood.'

I do not see any general pragmatic approach that will avoid the recognition of two distinct meanings within the semantic interpretation of the sentence. Pragmatically, we can recognize the rules for the choice of the 'strict' or the 'loose' interpretation, where the difference between all and nearly all, never and almost never is neutralized. We could write a pragmatic rule that says:

- (10) If a speaker applies a universal quantifier to a situation where the strict interpretation is impossible, the loose interpretation applies.

There is massive evidence for the loose interpretation in many adverbial uses of all. Lynch says, for example:

- (11) a. It was all over the neighborhood ('many people knew about it').
 b. all kinds of trash ('many kinds')
 c. it all depends ('it depends on many things').

We also recognize an obligatory loose interpretation in the many uses of universal quantifiers as approximants:

- (12) a. the rocks 'n' all.
 b. the vats 'n' all.
 c. fights, and everything else.

The conventional loose, and obviously strict, uses of the quantifiers present fairly straightforward problems of interpretation. But there are a large number of sentences where the choice between the loose and strict interpretation seems undetermined. For the speakers I have examined, this is the case for about half of the universal quantifiers.

One way of getting at the problem is to consider the universal quantifiers as intensifiers. In sentences like

- (13) He was all tired.

this intensive meaning is the only one we can infer. Quantifiers with strict interpretation can be considered to be intensifiers. The concept applies more obviously to the cases of loose interpretation, where 75% is talked about as if it were 100%. Markers of intensity tend to cluster. Emphatic stress, adverbs like really, so and very, negative concord, and repetition often contribute jointly to the force of an utterance. Labov 1984 traces the distribution of these other markers of intensity across the various types of universal quantifiers subclassified by evidential context.

For all the speakers studied, the other marks of intensity were concentrated in sentences with undetermined uses of universal quantifiers: non-denumerable and subjective contexts. This was true even for two exceptional speakers who spoke with great precision and used only small numbers of undetermined quantifiers. This correlation supports the idea that in many of these contexts, the universal quantifiers are being used with the loose interpretation and act as intensifiers themselves. Unfortunately, we have no means of finding out in any one case whether the quantifier has this effect upon the listener -- until we devise experimental techniques to do so.

It seems likely that the intensive use of universal quantifiers is common, even their most common use in ordinary conversation. Moreover, the use of universal quantifiers as markers of intensity is more frequent than any of the long list of intensifiers described in Bolinger's Degree Words (1972), for some speakers more common than all the rest put together.

2. Quantifiers in Congressional hearings.

I recently began an examination of formal public discourse, with the help of my sociologist colleague and co-author, Teresa Labov. We selected a published record of two days of hearings held in 1975 before the Senate Committee on Violence and Vandalism in the Public Schools, headed by Senator Birch Bayh. We chose that material because it deals with a serious problem that is still with us, and a problem that presents a challenge to the largest principles of social order. We believe that it is possible to account for puzzling features of public language by a theory deduced from the general principles that deal with social order. The analysis to follow is a more detailed study of the universal quantifiers than is found in the first study of these materials (Labov and Labov to appear).

The first witness at the hearing was Albert Shanker, President of the American Federation of Teachers. The transcript of his opening two sentences gives an idea of the style of his public discourse:

- (14) Many authorities on education have written books on the importance of producing an effective learning environment in the schools by introducing more effective methods of teaching. None of them, however, seem to understand the shocking fact that the learning environment in thousands upon thousands of schools is filled with violence and danger. Violent crime has

entered the schoolhouse, and the teachers and students are learning some bitter lessons.

The hearings transcript also includes the written version of Shanker's statement and the written statements of most of the other speakers. The written version of (14) is almost the same as the spoken forms transcribed here, though at other points the oral statement departs quite widely from the written statement, particularly when there are oral exchanges with the chairman.

(14) includes a use of the universal quantifier none in "None of them . . . seem to understand". I take this in the strict sense, applied to a denumerable set of writers on education. There is one other strict use in the statement, and six other universal quantifiers.⁵ On the whole the use of universal quantifiers is limited. There are a great many exact numbers, as in the following:

- (15) Now these figures I cited tie in with the dramatic increase in public school arrests that have taken place in 1974. From 9/73 through 2/74, there were 313 arrests. . . during the period 9/74-2/75, there were 612 arrests, or an increase of 95.6%. According to the NYCPD statistics, comparable increases are shown in a number of areas. Juvenile arrests of persons under 16 years of age has increased 10% within one year. Youth arrests of persons between the ages of 16 20 has increased 18.3%. Juvenile arrests for felonies has gone up 13%, and for misdemeanors 11%.

There are also many partitive expressions, especially when Shanker is assigning blame to others:

- (16) a. I submit to you that part of the responsibility for the increasing violence lies with some of these very books and writers themselves.
 b. The terrible thing now is that there is a good deal of covering up.

Every-day speech normally shows universal quantifiers in many of these contexts, as in "The whole thing is the responsibility of. . .", "Everything is covered up. . ." When Shanker does use universal quantifiers in what seems to be the loose sense, he is usually attributing views to others, as in (17), where he expands on the point of view of the school superintendent:

- (17) If he says to a student who was carrying money, well maybe it was your fault, that is really a way of saying . . . I've got all these pressures on me.

If I proceed with your case, it's going to take me away from all my other duties and responsibilities here.

or the perspective of a child:

- (18) The child each year has a greater and greater belief that he will never learn these things.

These loose uses of the universal quantifiers do not appear in the written version.

On first glance, Shanker's statement strikes us as reasonable but concerned. He displays a strong concern for objective evidence. He quotes exact figures and he avoids extreme statements. In fact, this is characteristic of all the important witnesses at the hearing. Figure 1 gives a view of the oral and written styles of the witnesses compared to the speech of Tom Lynch, by means of three stylistic indices. The sections of the Senate Hearings examined include:

AFL: Albert Shanker, oral and written.

NEA: James Harris, the Executive Secretary of the National Education Association, oral only.

NASP: Dr. Owen Kiernan, executive secretary of the National Association of Secondary School Principals, oral and written.

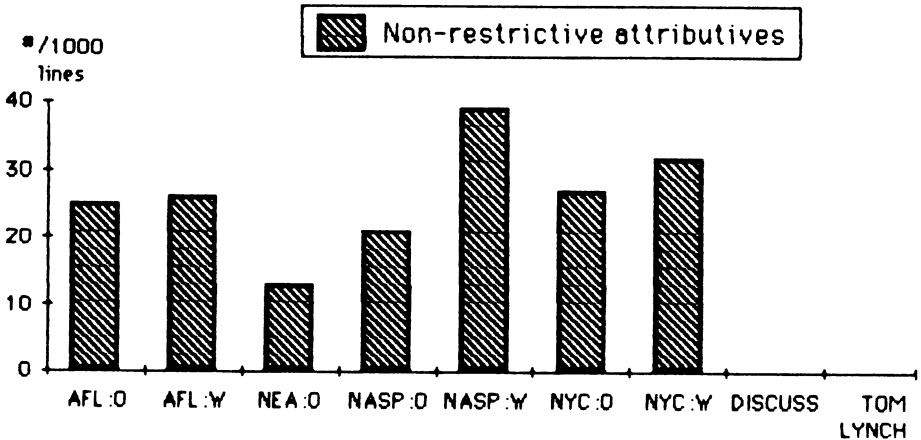
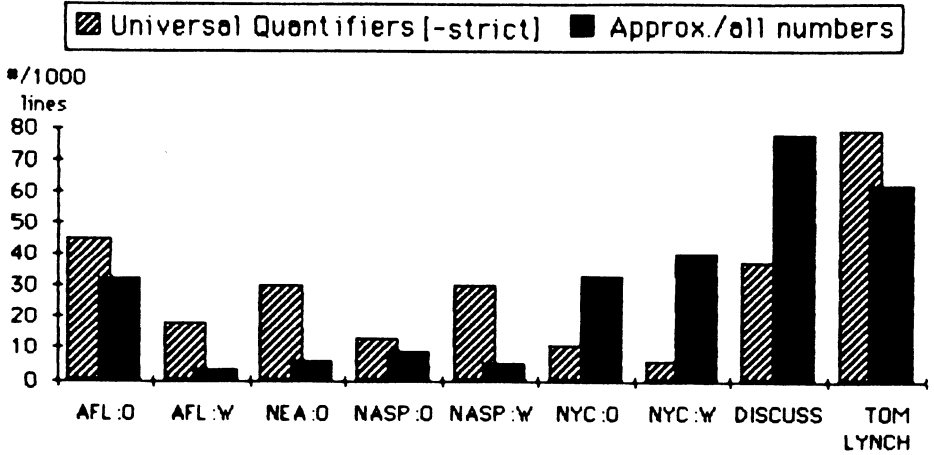
NYC: Irving Anker, Chancellor of the New York City Board of Education, oral and written.

DISCUSS: An extended discussion where all of these speakers except Anker exchanged ideas with the Chairman.

At the extreme right, Tom Lynch is shown for comparison. The horizontal axis shows the number of uses of three kinds of quantifiers per 1000 lines of the transcripts.

The upper half of Figure 1 shows two variables that are heavily concentrated in spontaneous speech, and appear with lower frequency in the formal statements, oral and written. The diagonally hatched bars show the frequency per thousand lines of universal quantifiers that do not clearly have a strict interpretation. Proceeding from the left, a fairly high frequency is shown by Shanker, but as we have seen, most of these non-strict senses are attributed to others. Other witnesses on the figure show a very low use of this indicator. At the right hand side, the frequency rises considerably for the discussion sections, where there are many adverbial uses of all, and rises to a high peak for Tom Lynch.

Figure 1. Three stylistic indicators in Senate Hearings and the speech of Tom Lynch, Philadelphia



This restricted pattern of universal quantifiers is matched by a second variable in the upper half of Figure 1. The solid black bars show the ratio of approximate expressions to all numerical expressions (times 100 to fit the vertical scale). Shanker uses only a few approximates: "for three or more years", "close to 1,000"; and many exact ones: "95.6%", "474 assaults". The discussion section of the hearing shows a very high value. Lynch also has a high value for this index. He shows an extraordinary number and variety of approximate expressions in his speech:

(10) one or two	fifteen or twenty
three or four	in the thirties
four or five	seventy-five or eighty
seven, eight	ninety, eighty
eight or ten	pretty near a hundred
ten or twelve	about four, five thousand
ten or fifteen	

and many fewer exact ones. The approximate number index is roughly parallel to the universal quantifiers. The chief exception is Anker (NYC). In both the oral and written column, his universal quantifier use is low but the proportion of approximates is high as a consequence of the topic he was dealing with. Chancellor Anker used much of his time to discuss the drug problem, and emphasized repeatedly that we are unfortunately missing exact figures on drug use and drug sales.

The low values for the approximate number index for the witnesses supports the view that they are trying to speak as precisely as they can in the hearings, and the restricted use of universal quantifiers is also consistent with this view.

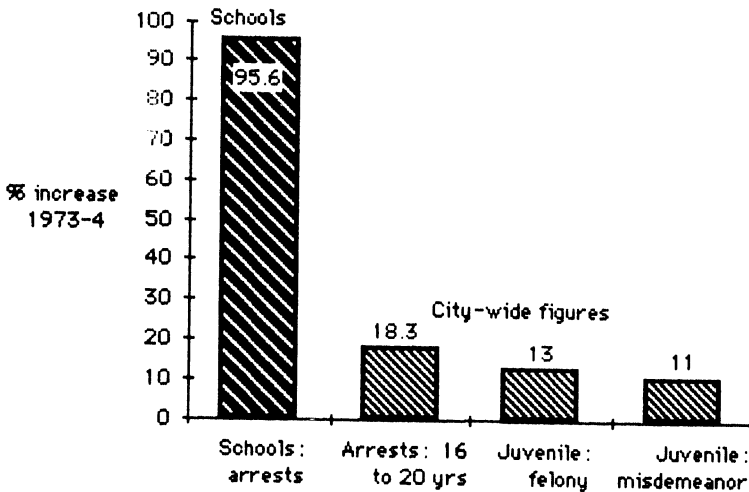
The third index follows a converse pattern, as shown in the bottom half of Figure 1; this is a feature common in formal discourse but absent in every-day speech. It is the use of non-restrictive attributes, as in Shanker's opening statement (14): "None of them, however seem to understand the shocking fact that the learning environment in thousands and thousands of schools is filled with violence and danger." There are many others: "crushing social problems"; "the mounting crime rate"; "grim statistics"; "sad story". These nonrestrictive attributives, with all of their peculiar semantic and syntactic properties, play a major role in our analysis of the underlying social propositions that govern the discourse, which I will return to below.⁶

So far, this public discourse appears as a reasonable mode of communication. Speakers seem to be striving for whatever hard evidence they can find; they apologize for approximations, and avoid exaggeration in their criticism of others. Their speech shows some influence of the non-logical system of every-day speech, but on the whole it seems to approximate the grammar of logical or scientific discourse.

3. Some inconsistencies in formal discourse.

Before we accept the conclusion of section 2, we have to account for certain puzzling inconsistencies in the testimony. One is contained in (15), quoted as an example of Shanker's use of exact numbers above. The argument is that the increase of arrests in the schools "ties in with" and is comparable to a widespread pattern throughout the city. If, however, we were to present these figures to a scientific meeting, we might be expected to draw different conclusions.

Fig. 2. NYC: comparative increases in arrests in the schools and in the city as a whole



The changes are comparable in direction but they are certainly not comparable in magnitude. Figure 2 compares the increases in arrests within the schools to increases in arrests in the city as a whole on the basis of Shanker's statement. It is evident that the increase of arrests in the schools is eight or nine times the general increase: the police have been very active in the schools. Yet he uses the word "comparable". This is puzzling, until we read further in Shanker's testimony, where it becomes evident why he did not call attention to the ninefold difference. Shanker's explanation for the increase in crimes is that the victims are afraid to complain:

- (20) The victims of assaults -- both teachers and students -- are reluctant to report them and to press charges because of the all-too-prevalent strategem of shifting blame from the assailant to the victim himself.

He elaborates on this theme at some length. Teachers will not complain because they may be accused of provoking the assault. Supervisors discourage complaints because of the time needed to make reports and attend hearings. Those who complain must pay legal fees, while civil rights groups pay for the defendants' expenses. Children who are mugged may be accused of having invited the attack by carrying too much money. The chairman interrupts the witness to express his astonishment at this last report, and he is assured that it has happened.

The business end of the Teachers' Union's argument is that Congress should reduce due process and the right of appeal for students, established in the Jan 22, 1975 Supreme Court decision of Goss et al. vs. Lopez et al.. We can understand Shanker's motivation in not emphasizing that the increase in arrests within the schools was much greater than the city-wide pattern. It is not so easy to understand why the Chairman did not point out the contradiction. If the increase in arrests was nine times greater in the schools than in the city as a whole, it does not seem to follow that victims are afraid to report crimes or press charges. And we know from an article published a year and a half later (Bayh 1977) that he was against the restriction of due process.

The second example of inconsistency is from Anker, the chancellor of the New York City Board of Education:

- (21) The big city is an area in which many of the crushing social problems of the city itself intrude and are acted out not only by the students themselves, but more often by forces that invade the schools, generating problems that have their genesis in the surrounding community. Of the 4775 incidents, for example, reported in 1973-74 -- the last complete school year -- of the 4775, 1020 were by intruders who gained entry into the school building by a variety of means.

Reading the report, we might be tempted to think that "more often" in line 4 is a misprint for "less often". But surprising enough, no one at the hearings intervened to say, "Excuse me, Chancellor, did you mean to say "more often"? 1020 is not more than 3755."

Again, it is not difficult to understand the speaker's motivation. He is urging Congress to provide money to place more police in the schools, in order to keep intruders out. It would hardly be consistent to point that that of 4725 incidents, 3755 were by students already within the schools who could not be kept out.

There are other examples of inconsistencies in the use of quantifiers. But though there are many interventions to point out the astonishing nature of the facts being presented, there are none to call attention to these apparent contradictions.

The third example, taken from the testimony of the secretary of the National Association of Secondary School Principals, involves a non-restrictive attributive.

- (22) Speaking on behalf of some 35,000 principals, I want to strongly affirm our support of "student rights", however that much abused term may be defined.

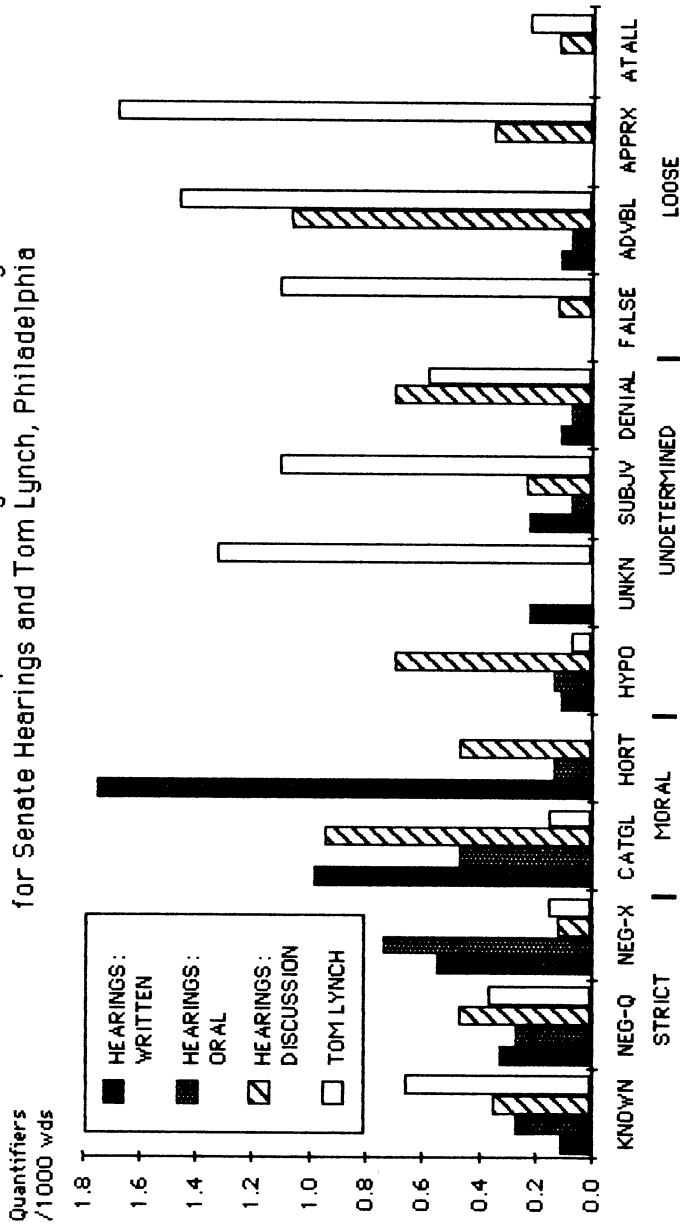
This is a clear syntactic oxymoron. Literally, the speaker is supporting something that he believes is wrong. No one asked the speaker why he would support a claim for students rights in a situation where he thought it was an abuse of the language to call it a case of student rights.

There are several ways to approach these inconsistencies. First, it must be understood that this discourse, and much other public discourse, is carried on in a context of crisis. The speakers are engaged in showing that the need for action has long since passed the point where any reasonable person would be impelled to act. In this case, Congress is not empowered to act until it is abundantly clear that all local resources have failed to solve the problem: teachers, principals, police, militia, judges, mayors, city councils and state governments. Witness after witness at the hearings says, "I have been waiting for Congress to act for years." It follows that the evidence brought forward is not comparable to evidence in a scientific inquiry, where numbers are used to determine the state of affairs. The speakers already know the state of affairs. The point of their testimony is that the troubles are so far past the point where action is needed that it is immaterial whether the increase in arrests is greater or less in the schools or outside of them; or if the proportion of attacks by outsiders is 3:1 or 1:3. In the crisis context, it is likely that anyone who intervened to point out the discrepancy would be open to the charge that he is taking 1,020 attacks by outsiders very lightly. In the context of the moral propositions that dominate the discourse,⁷ any attempt to estimate the size of the problem precisely can be interpreted as an inadequate expression of concern. We are dealing with a discrete logic which does not suffer quantitative distinctions. Here formal discourse uses universal quantifiers in the hortatory and categorical senses to intensify and evaluate utterances, while every-day speech uses these quantifiers with the loose interpretation to achieve the same ends.

4. The semantics of universal quantifiers in the hearings

Figure 3 analyzes the use of universal quantifiers in greater detail than Figure 1. The vertical axis is now quantifiers per thousand words. The horizontal axis classifies the quantifiers by their semantic interpretation: strict on the left, loose on the right, and undetermined in the middle. A fourth category of Moral is introduced, to be explained below. These major categories are assigned on the basis of a more detailed classification directly above them, which is based on the evidential context. The distribution of universal quantifiers is not shown for individual speakers, but summed under four over-all types: the written

FIGURE 3. Universal quantifiers by evidential categories
for Senate Hearings and Tom Lynch, Philadelphia



statements submitted at the hearings; the oral statements; the discussion during the hearings; and spontaneous speech of Tom Lynch, taken as representative of every-day speech.

At extreme left are the evidential contexts that favor strict interpretation: known sets, and then negation or limitation of a quantifier: "not all", "almost never", etc. The third element is NEG-X or assertion of non-existence: "There is no information on this." This is a reasonable context for strict interpretation, since a single observation would be enough to falsify it.

In general, there are no big differences in the use of the strictly interpreted universal quantifiers on the left. But the group of categories on the right, which dictate a loose interpretation, show sharp differences. For the formal statements, both in speech and writing, these loose interpretations are almost non-existent. The diagonally hatched columns show a very high value for the discussions during the hearings, particularly in the adverbial loose interpretations. The speech of Tom Lynch, as shown by the blank columns, yields a very high frequency of loose interpretation in three of the four categories. The use of conventionally loose quantifiers appears to be one of the strongest stylistic features of every day speech, and their absence one of the marks of formality.

The two central "undetermined" categories are the non-denumerable sets as in (7), where membership is unknown, and subjective opinions, as in (8). For these we observe a clear separation between Tom Lynch, representing every-day speech, and the hearings as a whole. Under this "undetermined" rubric I have included two other categories which were not considered before. One is the denial of the universal quantification, as in:

(23) You and all the other witnesses have such a wealth of information to give us, we cannot ask all we wish.

--Sen. Bayh, p. 82.

Here the scope of the negation includes the universal quantifier (the NEG-Q interpretation of Carden 1970). This might be interpreted to mean that Bayh has reviewed, one at a time the individual questions he would like to ask, and has drawn a line to exclude some: a strict interpretation. But it might also be taken in the loose sense, that there are a great many questions he cannot ask. In this particular case, the loose interpretation includes the strict interpretation. The distributions make it seem the most probable one, since the discussion shows a fair number of these constructions, even more than spontaneous speech.

On the other end of the "undetermined" group, there are hypotheticals like the following:

- (24) Although he or she might have committed a grievance that requires discipline, if that discipline is not explained to him in detail, it might reawaken all the old prejudices to which they have been subjected.
 -Sen. Bayh, discussion, p. 77

The universal quantifier is contained within the evidential context of the hypothetical if, and the irrealis might as well. In this case, the set being quantified is itself subjective. The following example refers to a more concrete set, but also embedded in a hypothetical structure:

- (25) If we were to go back then we could probably compile tremendous lists of injustices that were committed against students who had no opportunity to respond, and no recourse. --A. Shanker, discussion, p. 73

Since the situation is hypothetical, the evidential possibilities for interpretation must fall into the category of "undetermined".

The general category of "moral" uses of universal quantifiers was not used in any previous analysis, but emerged here as a characteristic of formal, public discourse. They are the only uses of universal quantifiers which are more frequent in the hearings than in every-day speech: they are especially prominent in the most formal material, the written statements. The moral uses are subjective; but they do not refer to subjective states of the speaker or author. Instead, they make reference to positions held by society as a whole. These are "categorical" uses of the universal quantifiers: they apply almost by definition to all possible members of the set. Anker's written statement includes many examples:

- (26) a. drug abuse, which affects all segments of the youth culture"
 b. They need what all human beings need and want.
 c. Unless this is done. . . I fear for the future of the great cities of this country, and all of its proud institutions.

It would not be relevant to search through all of the proud⁸ institutions of the United States for counter-examples -- institutions the author did not fear for. The fear appears to be centered about a more abstract object than the

individual institution, but the set of institutions as a whole. The identification of such moral uses is simpler for the other sub-category of "hortatory" uses, where the predicates of moral obligation are explicitly added, as in these examples from the same statement:

- (27) a. All of these problems demand the attention of this sub-committee and the combined efforts of all of the political, social and economic agencies.
b. The problem of narcotics addiction and substance abuse is a massive, grim, frustrating and challenging one which calls for the combined efforts of all community and governmental agencies to tackle a problem that has taken a dreadful toll of our most valuable social resources. . .

The verbs "demand" and "call for" are hortatory and make plain the all-or-none character of the quantification involved. Moral obligations of this sort are imposed on all individuals and institutions. Since (26c) follows (27b) directly, it is even clearer that the quantification over the "proud institutions" is a part of this compulsory semantic. In Shanker's statement, we find even more clearly:

- (28) Student involvement in any and all programs is imperative.

We might differentiate the moral uses of quantifiers from the others by constructing appropriate responses to possible challenges. For the conventional loose or subjective use, it is typical to find retreats or modifications:

- (29) --Do you mean you were never still?
--Well hardly ever, you know what I mean. I was very active.

while a challenge to a hortatory use is appropriately met by a reinforcement. In response to Shanker's (28), one might find:

- (30) --You mean we all have to be involved?
--I mean every single one of you.

This response is possible because the hortatory and categorical predications are put forward in the crisis context. Here it is not relevant to point out any limitations in the degree to which the major propositions are true.

It is evident that the moral uses of the universal quantifiers are [+intensive]. They represent an important device for intensification in formal discourse, and are almost in complementary distribution with the intensifying uses of the loose interpretation in every-day speech. The black columns in Figure 3 show high values for both categorical and hortatory categories, reversing the pattern found in the other sections of the chart. The uses of universal quantifiers by the witnesses in the hearings is not as remote from the patterns of every-day speech as first appeared. They use a slightly different set of linguistic forms to accomplish the same goal of intensifying the most highly evaluated semantic elements.

5. The grammar of English.

A systematic treatment of the speech acts involving the universal quantifiers requires articulation with the larger principles of social order. Here we are concerned with the semantic analysis of the universal quantifiers as they appear in the grammar of English sentences. How should they be represented?

The traditional approach would be to continue to represent them with the strict interpretation. In terms of discrete features, they would be [-partitive], opposed to the [+partitive] quantifiers some, many and most. One could add rules, possibly based on universals from speech act theory, that neutralize [partitive] in certain contexts, perhaps [+intensive]. The strategy seems to follow the reasonable general principle of starting with the most highly differentiated system, with strictly defined universal quantifiers opposed to all other quantifiers, and deriving the less differentiated system from it. But no general solution would deal with the specific behavior of the four quantifiers involved.

Each is almost entirely limited to formal speech and writing, and to the strict interpretation. All as we have seen demands the loose interpretation in many contexts and favors it in others. Any carries the [+intensive] feature more consistently than any other. It is unlikely that a set of universal rules can serve the needs of language learners who have to master the intricacies of this system. The particular configuration we have in English is the result of an historical evolution of the distribution of the [intensive] feature. This would be reflected in dictionary descriptions of particular constructions like at all but also general

instructions on the availability of the loose and strict interpretations.

Finally, we may want to consider the consequences of this analysis for the relations of language and logic. I have pointed to a number of areas where logical inferences cannot be drawn as school book grammars demand, where the more precise or mathematical use of quantifiers is generally inhibited. It appears ever more likely that the rules of logical inference taught in the schools are restricted in their application to public discourse, and we must continue to ask whether or not these rules form the proper basis for the grammar of natural languages.

FOOTNOTES

¹This is the third in a series of papers that examine the relations of social and emotional expression to representational content in language, following Labov 1984 and Labov and Labov (to appear). I have drawn on the findings of the first two papers in this one, and I am particularly indebted to my co-author T. Labov for many of the social principles and insights into public discourse. I am grateful to Gillian Sankoff for a number of suggestions and corrections.

²One version of a semantic analysis of these four quantifiers appears in Labov 1972, Ch. 4. As demonstrated there, the forms of any that incorporate a negative element are included: nobody, noone, nowhere, none, etc.

³Lynch was interviewed by Anne Bower, in the course of research on Linguistic Change and Variation in Philadelphia, supported by the National Science Foundation. A more detailed view of his use of universal quantifiers is found in Labov 1984.

⁴A term I owe to Guy Carden.

⁵See below for the special character of these other uses of universal quantifiers, actually attributed to other persons.

⁶Shanker's sentence quoted here also contains an instance of a quantifier that is specialized for formal discourse: the hyper-quantifier thousands upon thousands.

⁷A basic moral predicate of social order is that "In a good society, persons should be secure from violence". It is the repeated violation of this proposition which leads speakers to express fears for the future of our society.

⁸The non-restrictive use of proud here echoes the high concentration of non-restrictive adjectives throughout this section, another of the intensifying devices of public discourse.

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