TECHNICAL DISCOURSE AND TECHNOCRATIC IDEOLOGY

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Technical and Technocratic Discourse

Many linguists have studied the written language of science, partly because it is a relatively distinct register of the language with an easily available body of texts, and partly because mastery of this particular register is highly valued in modern society. Some of us have also studied the spoken language of science, the language of science teaching, and the various registers of medicine, engineering, economics, sociology, and even linguistics. We know that all these technical registers share certain linguistic features, and many of us feel that there are even deeper rhetorical and text semantic similarities among them that have not yet been fully articulated. These common features arise in part from a common history, for the many technical registers of today derive from a few common ancestors, but features are also shared because of the similar social functions of all technical registers.

Those social functions, the wider social uses of technical discourse, change as society changes. Because we have mainly studied technical language from within its own view of itself, we have not always looked critically at the place of technical discourse within the larger system of social relationships among discourse varieties. Those who use technical language are taught to see it only as a specialized tool for technical tasks, and to assume both that its features are shaped only by adaptation to those tasks and that the only social consequences of its use are those of the tasks to which it is put. But we know that this is not true. Language in use is never a value-neutral instrument, never stands outside the system of social relationships of the wider society. Language makes meaning only insofar as members of different communities read one text in relation to many others, and the practices of meaning-making, whether in writing, reading, speaking, or listening are always social practices that differ from one social group to another and help constitute the social relations among those groups. These are fundamental principles of social linguistics, whether they are formulated in terms of the sociolinguistics of variation theory or through the discourse linguistic principles of intertextuality and social heteroglossia (see Lemke 1985a, 1988c, Forthcoming, and below).

We need to ask, about all uses of technical discourse, including our own, how their features situate them in the world of social relationships: the world of conflicts of interest and values. How are the features of technical registers used? and how do they function, even apart from conscious use, to establish and maintain relationships among social groups, their interests and values? This is another way of asking: What are the ideological uses of technical discourse in modern societies? I believe that in trying to answer this question we shall also be led to a deeper understanding of what the common features of technical discourse actually are, and what they mean.

This is a very large problem, of course. In this paper I will only try to define one part of it and report some work I have done which is still unfinished. I want to consider here the use of technical discourse within the arena of social policy debate. I believe that increasingly in recent decades social policy has been argued by some groups less in the language of social values and social interests and more in the language of `objective fact' and necessity. In many areas of social policy we hear a relatively new form of argument: that because the facts are as they are, certain actions follow. We hear a course of action justified less and less on the grounds that it is right or good or proper, or that it benefits the interests of this or that social group, and more and more often on the grounds that it is what expert analysis of the facts demands that we do. I believe that this hybrid of technical and policy discourse, which I will call technocratic discourse, is a tool that serves the interests of a mangerial social elite, which is successfully wresting power from its traditional owners in many societies. It is doing so by attempting to bypass growing social conflict over values, arguing only in terms of technical debate over `facts'. It seeks to control this debate, imposing policies that are in its own interests in the name of `objectivity'. Because the result of these efforts could be socially disastrous in many societies, including my own, I want to try to analyze in detail how technical discourse and its features are being used and transformed in technocratic discourse.

Heteroglossia and Discourse Analysis

Before proceeding to my main argument, I need to describe briefly the discourse analysis principles I will be using. I use the linguistic tools of Michael Halliday's systemic functional grammar to do a somewhat different sort of text analysis from that which is familiar from his own work (e.g. Halliday 1971, 1977, 1978, 1982). This is because Halliday examines a text in relation to the way it deploys the general semantic resources of the language, its lexicogrammar, noting how each feature of the text functions in its situational context. My own analysis builds outward from this toward the kinds of relationships a text has with other texts (see Lemke 1985a on principles of intertextuality and their relation to register analysis). The most important basis of these intertextual relationships, for our present purposes, are «MDBO»thematic formations. Essentially these describe common semantic patterns among the ideational meanings in a text, which the text shares with many other texts in a community (Lemke 1983a, 1988a, 1988c). A thematic formation is represented by a diagram in which thematic items (generally the participants and processes of the semantic clauses) are linked to one another by thematic relations described in terms of the semantics underlying Halliday's grammar, and a few ancillary categories from lexical semantics. Any grammatical features which are common to a technical register will show up either in its thematic formations or in the relations between them and their realizations in the text. A formation is a semantic abstraction from many texts, and so represents many different wordings for common meanings. Even the same text may use different wordings to instantiate the same formation in different places.

There is, however, an important further step beyond thematic intertextual analysis. Different social groups, and to some degree even different individual texts, tend to construe different metadiscursive relations among thematic formations. One group may write as if two formations mutually supported one another; another group may place these same formations in a relation of opposition or incompatibility. More generally, different groups have different value orientations to the various thematic formations in use in the society; preferring some, rejecting others, not simply on grounds of truth, but on axiological grounds, in terms of the groups' values (and interests). This important fact about our use of discourse was first emphasized by Bakhtin (1935, also Voloshinov-Bakhtin 1929). In Bakhtin's perspective, language, like society, is not unitary, but is torn between centripetal tendencies that tend to unify it (common semantic resources, a standard dialect and its grammar) and centripetal tendencies that pull it apart (sociolinguistic variation, divergent registers, conflicting social voices and their discourses). He noted first that all use of language is characterized by an orientation to the discourse of the `other' as well as to our own (dialogism), and then that the relations among the discourses of different social groups were a function not simply of the semantic content of the discourses (my thematic formations), but also of the differing value-orientations of each towards the others (social heteroglossia). The complex heteroglossic relations among the discourse `voices' of different social groups both mirror and help constitute their sociological «NB»relationships, including their conflicts of interest and generally their differing lifeways and social practices (Lemke Forthcoming).

I want to apply these methods and principles to analyze a microcosm of social heteroglossia: the technocratic use of technical discourse in policy debate. A key text for my larger study of these issues is a special publication of the United States Department of Education, entitled What Works: Research About Teaching and Learning (U.S. Department of Education, 1986), produced and widely circulated during the Reagan Administration. Despite its disclaimers, it has a clear political and ideological stance, and presents `research findings' as objective facts that presumably have clear implications for action. It is mainly a technocratic text, but it also reveals some aspects of the internal conflict among American conservatives between the new technocrats and the older Conservative establishment. In citing its `Findings,' What Works also cites the research from which they are drawn. Two of these research source texts will be included in our analysis. They were written by Herbert Walberg (1985), a prominent researcher in the field of education, who is best known for re-analyzing the results of large numbers of small research studies by statistical methods (research `syntheses' or `meta-analyses'), and for attempting to analyze educational `productivity' by analogy with the methods of economics used in industry. One paper, by Walberg and two co-workers (Graue, Weinstein, & Walberg 1983), reports one of the `research syntheses' (on the role of parents in their children's educational success or failure). It was written for an audience of researchers and is almost purely technical in its discourse features. A second paper, addressed to an audience of education and policy leaders, mixes technocratic and technical discourse to make policy recommendations based on Walberg's research (Walberg, 1985).

I will focus on only a few thematic strands that run through these texts: mainly on those that deal with the purported culpability of parents for their children's failure in school, and those in which conservative and middle-class social

values are most in evidence, though always disguised as results of `objective research.' We will see that technocratically argued policy serves only the interests of the technocratic elite, at the expense of society as a whole.

Technical Features and Technocratic Functions

The general form of my argment in this section will be to identify some features of technical discourse, consider their narrow functions within the scope of their technical uses, and then consider their possible wider social functions and how they are transformed in technocratic discourse.

Consider first some of the most commonly noted grammatical features of technical discourse (e.g Huddleston et al., 1968; Halliday & Martin 1993). For example, there are relatively few processes of direct action (Halliday's Material Processes; cf. Halliday 1985 for the terminology of systemic functional grammar as used here and always capitalized) compared with abstract relations. Other types of Processes tend to be expressed as Participants in these relations (nominalization). Animate agents, especially the human researchers, tend not to appear. This often results from using agentless passive clause structures. The nominalized processes on the other hand are relatively frequently reified and used as agents in the place of human agents. So for example, we find near the beginning of the research synthesis article (Graue, Weinstein, & Walberg 1983: 351; hereafter Synthesis: 351):

"Enough of these programs have been evaluated to provide an overall assessment of their effectiveness, ..."

There is no agent which has done the evaluation (and it certainly would not be Walberg et al.); the process `assess' is nominalized as a participant, as is the process-derived epithet `effective'. Just after this, we find:

"Many large-scale sociological and economic studies show weak and inconsistent associations of educational outcomes with school-resource proxy variables ...."

This gives a first example of the ubiquitous `studies show' or `research proves' formula in which the process `study', minus its (fallible) human Actor, is reified and made to do what the same or some other human Actor actually does. As Halliday (1967) and others have pointed out, nominalization is quite a useful grammatical strategy in Indo-European languages, whose resources for qualifying nouns (cf. the long noun phrase following `show' above) and for setting them in abstract relations to one another far exceeds its machinery for doing this with processes directly represented by finite verbs. Nominalization is, I believe, only the most obvious special case of a more general feature of technical discourse that I will call condensation. In brief, nominalization allows an entire activity, a Process complete with its typical Participants and Circumstances, to be understood merely by naming it with the process noun. The whole presuposed activity can then be qualified and related to other activities in a highly condensed manner. The complete activities, and thus the complete meanings, are recoverable by readers familiar with the thematic formations by which the activities would be explicitly described. In the wider social context, discourse types that rely heavily on such features divide the world of potential readers into initiates and the unitiated to a much greater degree than do other kinds of texts.

Technical discourse is also dominated by third person forms. No `I' speaks to a `you,' no space for dialogue, disagreement, or differing points of view is opened in this way either. Even the solidary (inclusive) `we' is absent, and only the authoritative authorial (exclusive) `we' of multiple authorship is allowed. The world of technical discourse is a closed world which admits no criteria of validity outside its own. In Bakhtin's terms, it is a preeminently `monological' discourse.

In its own terms, technical discourse minimizes its use of the interpersonal, exchange, and dialogical resources of language because it claims to be a value-neutral, objective reportage of the facts. It claims to present facts, speaking for themselves, and not merely the inferences and judgments of researchers. Its general conclusions are meant to be universal, within the limits set for the subject. They are no more expected to make use of deictic Person than of deictic Tense; they are true for all time and outside human dialogue or opinion, independent of the particular human agent who has happened upon `the facts.' This historically and culturally specific ideology, which I will loosely call Positivism in the discussions below, is no more necesary to scientific practice than the discourse features I have sketched here are necessary to scientific discourse. Early science often made use of the Dialogue genre, and argued science as philosophy and theology had been argued before it. The features of technical discourse that we explain in terms of their limited technical functions have also been shaped historically by a cultural ideology that sustains the role and image of science in society.

Both condensation and monologism in technical discourse serve to establish and maintain a social elite and its claims of privilege and access to power. These strategies, once confined to technical and scientific discourse, have, with the increased power and visibility of science come to be adopted into managerial and bureaucratic discourse, from which technocratic discourse itself emerges. I will return later, when we have analyzed some specific examples, to the general sociology of these discourses. But first, let's consider in more detail what I consider to be the functionally preeminent characteristic of technical discourse: its extreme reliance on thematic condensation.

Thematic Condensation in Technical Discourse

For our first example, consider the second citation from Synthesis given in the previous section:

Many large-scale sociological and economic studies show weak and inconsistent associations of educational outcomes with school-resource proxy variables ....

We might ordinarily say that this clause `presumes a great deal of background knowledge.' But in what does that `knowledge' actually consist? It consists of a pattern of meanings, semantically realized in language, and held in common by this text and by many, many others. In fact it consists of several such intertextual thematic formations. What are we to make, for instance, of `large-scale' in relation to `sociological and economic studies'? We must have read other texts in which it is made clear that `large-scale' in the thematic formations where such studies are talked about refers not at all to the spatial extension, but to the large numbers of `subjects' or `cases' that are included in a statistical analysis. Lexical items have a wide range of potential meanings in relation to other lexical items (cf. Hasan 1985, 1986), but their actual use meanings in a text depend more directly on their place in a particular thematic formation, i.e. their field-specific semantic valences. Thus `weak' and `inconsistent' also have such field-specific meanings, and it is familiarity with the thematic formations of statistical research methodology that enable us to read `weak associations' as `statistical correlation coefficients in the range 0.0 to about 0.4'. What are we to make of `educational outcomes' unless we know that a statistical correlation must be between two quantities, and that the outcome of education most often quantified is student test-scores? Again, this `knowledge' is simply familiarity with a repeated pattern of semantic connections between lexical items and their field-specific near-synonyms (together, abstractly, the thematic items of a formation), always expressed in language. And finally for `school-resource proxy variables' we need quantities that can stand in for estimates of the educational resources of a school. This last is not as easily retrieved from intertextual sources as were the student test-scores, and in fact examples are given in the remainder of the sentence: `such as expenditures per pupil and school size.' These also assume familiarity with thematic formations, not just those that tell us that the nominalized `expenditures' is an instance of the thematic formation <SCHOOL OFFICIALS--SPEND--MONEY--FOR-- ITEMS>, but the narrower set of intertexts from which we could learn that schools with more pupils are considered to generally have greater educational resources.

Of course, all discourse makes sense in relation to some such set of thematic patterns, but in technical discourse the degree of condensation, that is, the number of unexpressed thematic items and relations that are needed to make sense of those that are expressed is much greater than for other discourse types. To illustrate, let me take as our second example of thematic condensation the single most important sentence of Synthesis (as defined by the criteria of the genre of the technical research article), its main conclusion:

"The main conclusion of the present synthesis is that school-based home-instruction programs are consistently favorable and have, on average, large effects on children's academic learning."

Note, in passing, the absence of even an authorial human to draw the conclusion. It is as if `of the present synthesis' were a `subjective genitive' in classical linguistic terminology, as if the synthesis draws its own conclusion about itself. Elsewhere in the article we are told what `school-based home-instruction programs' are. This nominal group, whose principal thematic item is `home-instruction' condenses many variations on the theme:

<PARENTS--[PROCESS]--CHILDREN--AT HOME>,

where the Processes themselves condense activities like reading aloud, discussing a TV program, setting aside time for homework, etc. Obviously we might take `children's academic learning' to be similarly complex, but in fact it is just a local synonym for students' test scores -- until it is extracted from the text, when it will be taken by all readers who do

not know its exact origins as meaning much more than it does. Note, however, that `test score' itself condenses a complex process in which someone writes down questions and problems, students, under particular conditions, answer and solve them, a teacher or someone else decides what answers are correct and in what degree, and a quantitative scheme is set up that usually counts each separate question as of equal numerical value to each other, and someone adds up the number correct and perhaps applies a formula to convert the result to a standard form. Expand the condensation into such a narrative and dozens of critical questions arise concerning the values and validity of the practices. Condense it all down to `test scores' and there is perhaps only a general reservation about the importance of test results in education. Go further and re-lexicalize it (in the context of a thematic formation already in use in the text) as `children's academic learning' and all trace of the critique-evoking potential is lost (except perhaps for those who hate children, are against learning, or are anti-academic).

We have hardly yet touched the major condensations of this sentence. What do we make of `consistently favorable'? To whom? in what ways? To expand this we need to refer the first sentence in the `Results' section of the text (following standard genre nomenclature again):

Calculations showed that 91% of the comparisons favor treated groups.

`Calculations', here reified as the Actor, are nowhere explicitly described in the text, and must be inferred by the expert intertextually. A less intertextually expert reader can still construe the rest of the sentence on the standard thematic pattern of statistical research methodology:

<COMPARE--NUMERICAL INDEX--OF TREATED GROUP--WITH--NUMERICAL INDEX--OF CONTROL GROUP>.

`Favor' has to mean that the index, usually the mean test score, of the treated group is greater than that of the control or untreated group. `Treated' means that in <PARENTS--[PROCESS]--CHILDREN--AT HOME> the Process was the `treatment.' Please note, by the way, that there is no end to possible thematic expansions; there are no ultimate, irreducible `semantic primitives' (except perhaps those that underlie grammatical relations). Any thematic item can be, and to be construed must be expanded through a thematic formation. What is at stake in highly condensed discourse is the accessibility of formations for readers and the issue of which formations the text proposes as adequate for (canonical) expansion.

That leaves us with `have large effects,' which does not have here its simple meaning, for `effects' is used in this article and in this sort of research generally in a specifically quantitative sense. For example, the title of Table 4, which covers a full 2½ pages of this 10 page article and which to the technically expert reader contains most of the specific content of the article (far more than the less than ½ page devoted to explicit discussion of its contents), is: Analysis of Variance and Covariance of Effect Sizes. The Table lists, among other data, these `effect sizes' to two decimal places. What then is meant by a `large' effect? Large compared to what? In fact, as established in the other article by Walberg, and used in What Works, it means large compared to the quantitative effect of socio-economic status in similar studies. This is in fact indirectly stated in Synthesis (p.351) at the outset:

Other research suggests that specific and alterable behaviors of parents toward their children such as intellectual stimulation in the home environment are still more strongly predictive of cognitive development than are such proxy variables as family SES and size.

Again `research' is making the suggestions, and `suggests' is itself a lexical realization of the modal `may' (contrasting, for example, with `show'), reminding us of the due caution of truly objective research. We see again the `home instruction' thematic pattern, and the quantitative comparison comes now in the form `more strongly predictive of', which fits with yet another thematic formation of statistical research and can be paraphrased there as `are more highly correlated with' and `have larger statistical effects on outcome measures of.' An entire semester course, or an introductory statistics textbook is condensed in the formations needed to make these connections explicit. To complete even this bit of the picture, we would have also to be able to expand `cognitive development' (except that again it is just another synonym for test scores) and `family SES', which is someone's guess at a measure of socioeconomic status.

If you have not yet guessed the central theme that the article's main conclusion presents in this context, it is that the reason why the children of the poor do badly on tests in school is much more because their parents do not give them proper intellectual stimulation (and a few other things, such as middle-class social values, see below) than because of

the social position of their family and its poverty. Condensation does a remarkable job of hiding the implicit ideology in this thesis, even from relatively sophisticated readers of purely technical discourse. Indeed it is hidden so well that separate articles by Walberg (e.g. Walberg 1985) were needed to bring it into policy discourse.

But what functions does this high degree of condensation serve, other than the legitimate ones of allowing for ease of constructing relations among nominalized processes and process-defined quantities? Most evidently, it makes every scientific text critically dependent on the canonical thematic formations it assumes the reader to be familiar with. Technical discourse is opaque even to the intelligent reader armed with a good technical dictionary, unless he or she is familiar with the semantics of the needed formations. Even an acquaintance with the historical texts in which these formations originated may not help, for they have been revised in each generation, and codified in `canonical' form in the textbooks. As George Markus has pointed out, there is no hermeneutics of natural science (Markus 1987), in the sense that technical texts are not `open to interpretation' the way philosophical, literary, or most other texts are. For most texts of significance, it is necessary to decide how they are to be read, including how they are to be read intertextually in relations to other specific texts. Technical texts exist within a system of reading practices that specifies uniquely one and only one canonical interpretation in terms, not of specific other texts at all, but directly in terms of the standard thematic formations.

A taste for brevity, for mathematical expression, and for condensation are all part of the technical mode of discourse, one which can presume that all licensed readers will read a text in terms of the canonical thematic formations. Canonical reading is what makes high degrees of condensation, including mathematical expression, possible without losing the reader altogether. But it serves another obvious function: to make technical discourse the exclusive property of an initiated elite. To be self-taught in theoretical science or advanced mathematics is extremely rare compared to what is possible in other fields. To read and use technical discourse one must have learned the canonical formations. In history, in literature, even in most of the social sciences, you can learn from reading original source texts. In the natural sciences, and all truly technical fields, the textbook has been made essential. Of course, the textbook is not enough in most cases. Very few people learn science from textbooks without teachers, and very few learn it even with teachers. Someone must translate the language and semantics of the technical thematic formations into more familiar terms, as good teachers (and few textbooks) do (cf. Lemke 1983b). Someone must open the door, from the inside. Technical elites are maintained not by the secrecy of their discourse, which they proudly publish to all the world, but by their control of the education that supplies the thematic keys to interpretation.

The opacity of technical discourse permits technocratic discourse to use the prestige and mystique of science to win advantage in policy debate, but it also obliges the technocrats to transform technical discourse into something that is comprehensible to a wider audience. This transformation frees elements of technical discourse from their canonical contextualization and redefines them in ways that better serve technocratic values and interests. We turn now to an analysis of value-orientations in technical and technocratic discourse, and the value implications of the technocratic appropriation of technical discourse.

Axiological Discourse Analysis

Thematic condensation and the other features of technical discourse associated with canonical reading can be adequately treated within the framework of thematic analysis, but those I have identified as characteristic of the monological character of technical discourse require something more. By and large, thematic analysis handles the *ideational component* of linguistic meaning in texts (Halliday 1978, 1985; Lemke 1983a). But the *interpersonal component*, which is backgrounded in monologic technical discourse, requires us to add a further dimension to our total analysis. Grammatical register analysis of the interpersonal functional systems makes points about the use of Person, Modality, etc. that are fairly well known for technical texts. But the semantic sense of the interpersonal component is wider than this, for it encompasses everything about linguistic meaning that refers to the stance or orientation toward thematic-ideational content on the part of the speaker and/or the real or potential addressee and other audiences. This includes orientation to addressees and audiences with respect to the content. We need to carefully analyze the axiological dimension of social heteroglossia, which dialogically penetrates all discourse and is partly realized through the interpersonal functions of lexicogrammar. We need in fact an axiological discourse analysis that will trace the construction of value-orientations and orientations to other explicit and implicit discourse voices in a text. It will include analysis of the grammatical systems of the interpersonal component, but also the attitudinal systems for lexical choice (cf. Halliday's `purr and snarl words'), and the wider value-orientations of social heteroglossia however expressed in the semantics of a text.

Axiological analysis is about the expression of evaluations, about how texts say and imply in their situational and intertextual contexts what they regard as good and bad, desirable and undesirable, proper and improper. Axiological analysis takes us very close to the realm of social relations of power and interest, to the heart of conflicts and alliances, and even to the interdependence of what we hold to be `good' for us and what we hold to be `true' for us.

Axiological analysis asks how a positive or negative value of some degree is assigned to a thematic item, relation, or formation on some scale. How are chains of positively and negatively valued elements constructed across texts? How are value-laden items or formations linked in terms of their values? How are whole formations set in value-oriented relations of alliance or opposition to one another (cf. Lemke 1988c). What happens to the value-orientations of thematic elements when they are shifted from one formation or discourse voice to another -- as for example from technical to technocratic discourse?

Let us examine the second paragraph of the *Synthesis* article with a specific aim: to identify two value chains and the discourse strategy by which they are combined. This will provide a sense of how, over much longer stretches of text, global axiological patterns are woven from simple value strands.

Look first at the value chain for high/low correlations, expressed in a number of different ways here:

Many large-scale sociological and economic studies show **weak and inconsistent associations** of educational outcomes with school-resource proxy variables such as expenditures per student and school size, and **relatively moderate and consistent amounts of variance** associated with student background variables such as socioeconomic status (SES) and family size (McDermott, 1976). Other research suggests that specific and alterable behaviors of parents toward their children such as intellectual stimulation in the home environment are **still more strongly predictive** of cognitive development than are such proxy variables as family SES and size (Walberg and Marjoribanks, 1976).

This chain <CORRELATION> shows a clear progression from negative, through low positive, to high positive value, strictly within the technical value-orientation. In this kind of technical discourse, high correlations (`association' `associated variance'), large-scale studies, and high predictivity are positively valued and their opposites negatively valued. Each element in this chain, regarded now as a thematic element, defines a relation between two other elements. One of those elements is in each case a positively valued member of a second thematic chain <LEARNING>, represented in the first two instances of

<LEARNING--CORRELATES--[to DEGREE]--WITH--[FACTORS]>

by `educational outcomes' and in the third by `cognitive development'. In fact all these mean no more than `test scores' .

The other element in each case belongs to a third thematic chain <FACTORS>, which is constructed by this text. Its members would hardly be recognized as forming a chain on purely lexical or general semantic grounds, or even intertextually within this field of research. It is constructed by being put into a common semantic relation to the other elements of this little formation.

Consider the elements of this crucial third chain now in terms value-orientations:

Many large-scale sociological and economic studies show weak and inconsistent associations of educational outcomes with **school-resource proxy variables** such as **expenditures per student** and **school size**, and relatively moderate and consistent amounts of variance associated with student background variables such as **socioeconomic status (SES)** and **family size** (McDermott, 1976). Other research suggests that specific and **alterable behaviors of parents toward their children** such as **intellectual stimulation in the home environment** are still more strongly predictive of cognitive development than are such proxy variables as family SES and size (Walberg and Marjoribanks, 1976).

What we see now in value terms depends on whose value-system we assume. From the point of view of a parent, we might expect that the first three FACTORS would be fairly strongly positive. Socioeconomic status is good when it is high, bad when it is low (as assumed also in the text's orientation), and larger or smaller family size is considered better or worse depending in part on social class and ethnic tradition. The suggestion of altering parents' behavior toward their

children is likely to be regarded rather negatively on its own terms, and intellectual stimulation in the home will be good, with a priority depending on the family's own values.

But what is happening here is that the technical value-orientation is being used to re-rank the value-priorities of its thematic partners. The high technical value of strong <CORRELATIONS> is being equated in this text with the importance of a <FACTOR>. When this is linked thematically to a common `good' <LEARNING>, it denigrates the value of what is `not important to learning' and elevates what is important. But now `important to' is being defined only as `strongly correlates with'. The ranking of factors that results runs counter to what we can expect (and the authors would probably expect) to be the values of parents, and even of many other educators. We are told that money spent on education has relatively little to do with students' learning and that lower class students don't do much worse than upper middle class students in school. The authority of `many large-scale...studies' is offered for these assertions. A critical reader might well consider the absurdity of these studies' conclusions as authority for doubting the reliability of social science research.

If the implications of `alterable behaviors of parents' are not likely to be positive for parents (who are of course not expected to be reading a research journal article which would be opaque to them), this notion is nonetheless highly valued technocratically. It represents an instance of the transformation of a technical value into a technocratic one. `Alterable behaviors' are valued in technical discourse not just because of their high correlations with test scores, but directly, as I will explain below. The particular example here, `intellectual stimulation', is likely to mitigate any negative reaction to `alterable behaviors' on the part of a middle-class reader, but to see what is meant here we need a little intertextual help (from elsewhere in this text):

> Poverty and family size, themselves correlated, both predict less intellectual stimulation in the home environment as well as lower levels of cognitive development (Walberg and Marjoribanks, 1976).

This may seem to contradict what was said in the main paragraph, but initiates in statistical methods will see that it need not. What is clear in this sentence, so full of negative valuations, is that `research shows' that there is a serious lack of intellectual stimulation in poorer families. Applied linguists will no doubt recall similar statements about the lack of full language development in poor homes, which turned out to conceal enormous ignorance of dialect and discourse style differences that correlate with social class. Since most intellectual stimulation in middle-class homes is verbal, the same ignorance may be relevant here as well. In any case, it should now be clear that what is being said in the text raises very controversial issues, and that different value systems are indeed in conflict in reacting to the text's apparently `objective' technical statements.

I want to complete the analysis of the value status of `alterable behaviors'. Just below the last cited sentence, we read:

> Although poverty and family size are not easily changed on a mass scale, the behaviors of parents may be favorably altered, if instructional materials are made available.

In the technical discourse of research, a factor or variable which can be altered, or `manipulated' is positively valued because it means that experimental studies can be done which systematically vary that factor. Otherwise one must simply hope to find cases where the factor takes on different values, with no hope of systematic experimental control. When this principle is carried over into the technocratic discourse of social engineering, `alterable' factors are valued over those `not easily changed' for a different reason and in a different sense. From a political perspective, conservatives and technocrats alike find it not in their interests to contemplate the extremely large expenditure of social capital, or the radical transformations of class relationships, necessary to change the effects of SES or eliminate poverty. It is in their interests to say that there is a cheaper way, and to give great emphasis to `research findings' that support this position, and none to those that might discredit it. Let us turn then to an examination of technocratic discourse itself and some of the texts that appropriate the conclusions of Synthesis.

Technocratic Discourse and Its Ideology

In the Introduction to What Works, Chester Finn, Jr., then Assistant Secretary for Research and Improvement in the Department of Education, sets out a brief version of what I take to be the principal ideology of technocratic discourse:

> "If we would have [our] actions be as well-informed as possible, in situations where we do not have knowledge we can reasonably allow our actions to be informed by "true opinion," by what informed people judge to be the "most likely story." In this volume, as you will see, we draw upon the knowledge and opinions of both modern scholars and of distinguished thinkers of earlier times."

The value-laden thematic chain here includes `well-informed,' `informed,'`true opinion,' and `knowledge.' These values of technical discourse are transposed here to support the premise of a technocracy.

Technocratic discourse argues for action and policy based on particular opinion regarding what it calls `facts' and from which it draws necessary or obvious consequences without explicit discussion of value-choices. Its value-system is an implicit one, largely fashioned from the transposed values of technical discourse, but made to serve the interests of a managerial class. The technocratic elite claims a right to rule on the grounds of its ability to use expert knowledge to solve social problems.

But, as in *What Works*, technocratic discourse does not wish to be read as just one more opinion regarding policy. It wishes to place itself `above the fray,' as a supplier of `facts,' neutral and objective, free of all interests and values except truth, which all parties must take into account in deciding policy. In their prefaces to *What Works*, President Reagan and Education Secretary Bennett emphasize that the proper role of the U.S. government is merely to supply information, not to influence local educational policy decisions. Here is Finn's version of this theme:

> "Why does the report contain so few specific recommendations about actions that should be taken?
> ... The appropriate design and implementation of [education] policies, practices, and actions will differ according to local conditions and it is not the place of the federal government to interfere. ... The purpose of this volume is to provide reliable information that people can, if they wish, put to use in various ways. In most instances, the reader will rapidly be able to visualize some implications for action of findings that we have included."

In fact, as linguists well know, a recommendation can be phrased grammatically as a description as easily as an order can be worded as a question. If it is so easy for readers to `visualize some implications for action' of what are presented as research `Findings,' it is because they are presented in a discourse form that makes them directly readable as prescriptions. Here are a few examples:

> Children get a better start in reading if they are taught phonics.

> The most effective way to teach writing is to teach it as a process of brainstorming, composing, revising, and editing.

> Student achievement rises significantly when teachers regularly assign homework and students conscientiously do it.

This is the dominant pattern in the wording of 33 of the 41 statements of research `Findings' in What Works. For comparison, the only one of the 41 that reads as a neutral description is (p.33):

> Children's understanding of the relationship between being smart and hard work changes as they grow.

The `value-plus-practice' pattern seen in these examples is a special case of the general value-construing strategy that characterizes technocratic discourse. The practices are recommended indirectly through the `Findings' because they are said to have a proven (or at least empirically supported) causal relation to some otherwise positively valued `good,' such as `achievement' `success' `learning' `higher test scores' `more effective education' and so on. If the correlations are not taken to be causal, the implications for action and policy are weakened significantly (see example below).

Technocratic discourse relies as much on the `hard sciences' as on the soft, and its model for argument is based on positivistic science's claims to identify true causes. In every case, technocratic discourse begins with an action it wants to covertly recommend as policy, cites `research evidence' and `studies' which show that this action is a necessary cause of something else which is positively valued by those to be convinced. No argument is made concerning the value of the outcome nor any as to value-choices regarding means. The argument is only that the covertly recommended means are necessary to the unargued ends. What is argued for is only the value of the evidence by which this necessity is

established (`reliable research') and the value of basing action and policy on expert knowledge. This form of argument is a regular discourse pattern in technocratic texts.

Another distinguishing discourse feature of technocratic texts is the way in which they incorporate condensations from technical discourse without requiring that the condensations be expanded in order for the text to be meaningful to the reader. As we have seen, technical condensations require canonical intertextual expansion by a trained expert reader, and render technical texts opaque to all other readers. But when they are incorporated in technocratic texts, a sense is constructed for them that does not require a reader to even recognize them as condensations. In fact, the technically expert reader who does so and expands them intertextually may well find that the arguments which seem so convincing on the surface (i.e. without the expansions) are entirely unconvincing with them. I will present an extended example of this in the next section.

A third distinctive feature of technocratic texts is that they are less monological than are technical texts. Characteristically, they do not raise value-choice issues, however, but at most pose thematic alternatives between what they would call `different interpretations of the same facts.'

The final characteristic feature of technocratic discourse that I wish to note here is its pervasive denigration of common sense. This theme establishes a value-orientation in both technical and technocratic discourse in favor of reasoning and explanations in technical terms that are comprehensible only to the initiate and against commonsense accounts accessible to everyone. I have studied this feature as it appears in the discourse of scientific education (Lemke 1983b, 1985b, 1988b). It functions there to undermine the confidence of students in their own ability to reason in domains where a technical discourse has been set up, and discourages them from trying to bring their ordinary experience to bear on such matters. In general, it helps to establish a heteroglossic opposition between `science' and `common sense' (with a strong value-bias in favor of science) that is ideologically useful in getting the public to defer to the `scientific knowledge' of a technical elite.

We need look no further for an instance of this theme than the discussion in *What Works* of classroom education in Science (p.23):

> Scientific explanations sometimes conflict with the way students may suppose that things happen or work. ... Unless a teacher corrects [their] intuitive assumption by having the students perform an experiment, and see the results, the students will continue to trust their intuition, even though the textbook or the teacher tells them [otherwise]. ... In this way experiments help students use the scientific method to distinguish facts from opinions and misconceptions.

The value-loadings here set `scientific explanations,' `experiments,' `scientific method' and `facts' against `students may suppose' `intuitive assumption' `intuition' and `opinions and misconceptions.' Note that science `explains' but students only `suppose.' That teachers and textbooks `correct' and `tell.' And that `opinions' are linked to `misconceptions' when both are opposed to `facts.' Above all it is negatively valued that students should `trust their intuition,' which is opposed to having them `use the scientific method.'

In reality, students do not usually change their commonsense ways of reasoning about events just because they have seen an `experiment.' Contrary to the ideological claim of Positivism, the `facts' do not speak for themselves, nor do they judge between rival theories. Until students have mastered the teacher's and textbook's technical thematic formation, they will not even be able to discern which features of the experiment are relevant to the technical argument. One does not `see the results.' We see as meaningful only the meaning-patterns we construct using some social formation, commonsensical or technical. (I document specific instances of this in the studies cited above.)

The general principle, common to technical and technocratic discourse, that is operating here is that there are unobvious, hidden causes knowable only in technical terms which are the true explanations of phenomena. The consequence is to establish an opposition between technical discourse and common sense, valuing the former and devaluing the latter. Technocratic discourse can then use this principle to claim the `rightness' of the `necessary actions' it puts forward in the form of `causes' and through which it seeks to dominate policy.

Technocratic Discourse Strategies: The Case of `Home Curriculum'

In Walberg's 1985 article addressing educational policy leaders (hereafter *Productivity*), we can find (p.24) a statement in the value-plus-practice format, founded on his own technical results in *Synthesis* regarding the `alterable curriculum of the home':

> ... school-parent programs to improve academic conditions in the home have an outstanding record of success in promoting achievement. What might be called, `the alterable curriculum of the home,' is twice as predictive of academic learning as is family socioeconomic status. This curriulum refers to ... joint critical analysis of television viewing and peer activities, deferral of immediate gratifications to accomplish long term human-capital goals, ... [among a list of at least 7 specific practices for parents]. Cooperative efforts by parents and educators to modify these alterable academic conditions in the home have strong, beneficial effects on learning.

We find in this the value labeling: `outstanding... success...achievement,' and later `strong, beneficial effects,' and the obviously recommended list of practices. The positive value terms are taken for granted, and the list of practices is linked to them because they are `a curriculum that `promotes' and `is ... predictive of' these valued outcomes, in fact `twice as predictive' as a factor (socio-economic status) that stands here for an alternative policy. The value-argument lies entirely within the realm of (transposed) technical values (here again the positive value of high degrees of correlation). The argument for the value of the practices links them quasi-causally to the valued outcomes. But no argument is made concerning the value-choice implications of the practices themselves.

The list of recommended practices in fact is notably biased towards middle-class values and against at least what middle-class people imagine lower-class values to be (e.g. immediate gratification, uncritical televiewing, lack of supervision of peer activities). How `alterable' are the `behaviors of parents toward their children' when those behaviors reflect class and social group values that differ from those of upper-middle class people of northern European heritage? There are value-systems in the world that do not regard higher test-scores as more important than children's happiness, free-play and independence, or even amusement; that see negative consequences of excessive parental supervision and abhor a preoccupation with critical analysis and the philosophy of `delayed gratification' that sacrifices human happiness to capital accumulation. Apart from all these questions, how effective can these prescriptions actually be if they are based solely on statistical correlations, outside the framework of a detailed explanatory theory? A brief look at this question will provide us an opportunity to observe the effects of concealing condensations in the transformation of technical to technocratic discourse.

In Synthesis, whose findings provide the `evidence' for Walberg's technocratic policy argument, the bulk of the research results appear only in a supercondensed form, the article's statistical Tables. A technical reading of those tables shows, for example (Table 4, p.358), that of the approximately 120 studies of home-intervention programs on which all the claims are based, only 22 lasted even as long as one semester, and 94 lasted less than 6 weeks. Any educational researcher knows that the claims being made on the basis of this data are significant only if long-term improvements in academic performance can be achieved. Any special interest by parents in students' work is likely to produce a short-term improvement which may not last, or may hit a plateau fairly quickly. Table 4 shows that as the programs lasted longer, the size of their effects *decreased*, with those lasting the full semester having an effect size no larger at all than the benchmark, socioeconomic status differences, and a significant probability of actually not being any higher than the comparison group which was not in the program at all. This last information is contained in an asterisk, whose explanation is several pages earlier, but would have been noted as a matter of course by an expert familiar with this technical register. In reference to these rather important `facts' the text says only (p. 355):

> Programs ... lasting five to six weeks rather than shorter or longer lengths of time showed larger comparative effects on average.

Reference to the Table shows that this is true, but refers to only 3 of the 120 studies, and represents a radical departure for those three from the otherwise smooth, and expectable, downward trend of effects with increasing length of the program, as would be expected if the effects were small and temporary. It is far more likely that those 3 studies represent a statistical fluctuation, a `fluke', with their effect sizes from 3 to 6 times bigger than those in the immediately adjacent categories of time length for the interventions, than that they represent a `magic length' of time to produce the largest possible effects. The technically expert reader brings just this capacity to expand the condensation of a technical text to a reading of the technocratic discourse which claims to be based on it, and which does in some ways incorporate or appropriate it.

By the time this issue finds its way into the technocratic policy discourse of *Productivity* (p.25), it has become:

> Although the average effect [of the programs] was twice that of socio-economic status, some programs had effects ten times as large.... Since few of the programs lasted more than a semester, the potential for those sustained over the years of schooling is great.

The weakness of the technical argument can be glossed over or even reversed here in its technocratic version because it does not signal the condensations which, for the technical reader, lie behind it. What we regard as `the facts' here, or in any argument, depends very much on how we expand the condensations that lie behind any discourse that purports to establish what those facts are. Technocratic discourse not only appropriates the prestige and the `facts' of technical discourse, but in doing so it also conceals the essential condensations of technical discourse. The deceptions of technocratic discourse do not depend so much on the non-technical reader's inability to expand these condensations (which would be true in purely technical discourse also), but on it's making the existence of those condensations largely invisible. Nontechnical readers do not even suspect that there is something important missing, something they need to know to evaluate technocratic arguments. Technocratic discourse takes condensed technical discourse and purveys it to readers as if it were not condensed at all. It is this ultimately simple discourse strategy which enables technocratic discourse to tailor the apparent scientific `facts' to the needs of its policy arguments.

In *What Works* (p.7) great prominence is given to research findings about the Curriculum of the Home:

... What parents do to help their children learn is more important to academic success than how well-off the family is. Parents can do many things at home to help their children succeed in school. Unfortunately, recent evidence indicates that many parents are doing much less than they might. ... When parents of disadvantaged children take the steps listed above, their children can do as well at school as the children of more affluent families.

Just below, in very small print, three articles by Walberg are cited in evidence. Here, the condensations are entirely hidden, except for the citations and what they imply to the expert reader. For all others, and certainly the readers to which *What Works* is addressed, there is nothing apparently missing, no opacity like that of truly technical discourse to signal that we need to know something more in order to truly understand what is being said to us.

Whatever elitist functions condensation may serve in technical discourse, eliding condensation in technocratic discourse only further enhances the power of the technocratic voice. Having read the surface message of this particular text, why should we be concerned to provide more financial resources to poor school districts when the parents could be solving the problems by acting more middle-class with their kids? And why should we take seriously sociological arguments that educational opportunities must be biased against the poor, when it's just a matter of parent behavior patterns?

Technocratic and Value-Centered Ideologies in Conflict

There is a strong antipathy among non-experts to the arrogance of the technocratic denigration of common sense and common people. This strategy may work successfully to encourage people to doubt themselves and defer to expert opinion, but at the same time it builds up an antipathy toward and an alienation from `the experts.'

Technocratic discourse carries with it its own values and ideologies, which represent the interests of a new class -- a class that is itself bidding to establish its own social dominance. If, for example, technocratic discourse can succeed in convincing people through *What Works* that research findings support traditional, conservative viewpoints about education, then it can substitute, in the guise of explicating those findings, viewpoints and policies which in fact favor its own interests. Common sense does not already have a well-formed opinion on everything. On most specific issues, a new discourse must be articulated, and usually it is articulated for people by social voices representing particular (often undeclared) interests. Technocrats, too, can articulate such discourses, modulating from existing commonsense views that incorporate values favorable to presently dominant groups (primarily the owners of wealth) to new views that favor its own interests.

In policy debates in recent times both Liberal and Conservative political discourses have attempted to co-opt technical discourse for their own purposes, but in doing so they assist the growing dominance of technocratic ideologies. In relying on technocratic arguments that bypass value considerations to support their value-based views, Liberal and Conservative discourses have also opened themselves up to technocratic influence. Just as there is no Commonsense

view of a particular issues until it has been articulated and accepted, so there is generally no specific *a priori* Conservative or Liberal view either. Technocrats are now in a position to help develop such views, based apparently only on `the facts,' but actually insinuating their own class values, interests, and ideologies into newly emerging Conservative and Liberal discourses.

The true opposition to technocratic discourse is value-centered policy discourse. I think that we can reasonably see in the recent rise of ultra-traditionalist movements around the world, including the Fundamentalist religious Conservatives in America, a reaction to the technocratic bid for dominance. Moral discourse is antithetical to technocratic discourse. The last defense by Conservatives against technocratic dominance is to call its `fact-based' policies `immoral' (for an example of this sort of discourse heteroglossia, see Lemke 1988c). There is an analogous Liberal defense, somewhat weaker because Liberal values have often shifted in response to changing strategies of opposition to traditional morality, in which technocratic policies are castigated as `inhumane.'

The technocratic class of managers, whose claim to a right to set policy is their command of the results of technical analysis, manages, like any other elite, in their own interests. Their values and ideologies support their interests, and those values and ideologies, and technocratic discourse generally, flourishes because today's climate of technical change is a constant source of new opportunities to articulate new policies about new circumstances. The technocratic claim to base policy on technical analysis of technical change is especially cogent under these conditions, and both sides in the older Liberal-Conservative debate have become increasingly technocratic as they have tried to co-opt the power of this kind of argument, as well as to utilize the real value of technical analysis. As things now stand, the dominance of technocracy in the near-term future seems assured.

For the longer-term, the most effective opposition to technocratic discourse will come, not from a monological moral or ethical absolutism, but from an honest discourse of value-conflict and interest-conflict that can articulate the complex relations of technical and policy discourse which technocratic discourse seeks to submerge. Culturally, many social groups strongly prefer to avoid the discourse of conflict and seek, on the surface at least, for social harmony and consensus. But when the surface harmony of a technocratic consensus in fact conceals policies which will inevitably provoke profound social unrest because they reflect the viewpoints and interests of only one social group, the technocratic managerial elite, then that harmony is more dangerous than the discourse of conflict itself.

We will need in the future to learn to appreciate the honesty and social benefits of divisive rhetoric which openly contrasts the perceived interests and values of the widest possible spectrum of distinct social groups. Only a value-centered policy discourse which does not merely disguise the interests of one group as universal truths or values can effectively undermine growing technocratic dominance of social policies. No one voice, but only the open dissension of voices, explicitly arguing from differing values and interests, can hope to forge a successful social compromise and displace the illusory consensus of the technocrats. Nor can we afford to forget that the relative dominance of discourses is only the most visible sign of the relative social power of the groups who use those discourses. To thwart the concentration of power in the hands of the technocratic elite, social power must be more widely shared across the spectrum of social groups and social interests than it has been in our past.

I hope that thematic and axiological discourse analysis can provide two useful tools for bringing into being a truly heteroglossic political discourse.

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