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by

Jeff Connor-Linton

Working Paper No. 17

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First Annual Conference on
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Ballyvaughn, Ireland

August 9-16, 1987



**Stylistic Analysis and Authors' Assumptions
in Nuclear Discourse**

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The conference held at Ballyvaughn, Ireland, in August 1987 was the beginning of an on-going international intellectual interchange on topics related to the discourse of peace and security and international society. It will include annual meetings, the second to be held in summer 1988, again in Ballyvaughn. Sponsored by the University of California Institute on Global Conflict and Cooperation, the conferences are intended to foster general inquiry into these scholarly topics and to stimulate research and teaching that incorporates these perspectives at University of California campuses. This year's series of working papers comprises the writings which seventeen authors submitted to their colleague-participants in preparation for the 1987 conference. Some have been updated somewhat before publication here. Some have been published elsewhere and are reissued here by permission. The Institute on Global Conflict and Cooperation hopes that these working papers will help to interest even more scholars in pursuing these lines of thought.

James M. Skelly
Series Editor

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Stylistic Analysis and Authors' Assumptions In Nuclear Discourse

Abstract

This study suggests the value of a "multi-feature/multi-dimension" method of discourse analysis (Biber in press) to the study of nuclear discourse by reporting some of the results of a pilot study of four different written texts about the nuclear dilemma. The quantitative results show the texts to differ in their uses of groups of concurring linguistic features and motivate a microanalysis of the texts seeking to discern the author's underlying assumptions about the relations of the United States and the Soviet Union to each other and to their nuclear weapons. The results also extend the work of James Wertsch (1987) in constructing a typology of modes of nuclear discourse by (1) describing concrete lexical and syntactic variation between nuclear discourse texts and between nuclear discourse, as a subgenre, and other written and spoken genres of English, (2) ascribing general rhetorical strategies to different authors' "styles" of nuclear discourse identified by the quantitative analysis, and (3) associating these "styles" of nuclear discourse with some aspects of the authors' world-views which form their cognitive foundations.

Introduction

In his introduction to a collection of essays on the nuclear crisis, Gwyn Prins (1984: ix) points out that it is only in the past several years that "the forty years' consensus within the Western strategic community has been broken." He recalls a time when

the debate about defense and disarmament appeared to the public to be simple. On the one side were governments and generals. They were seen to favor nuclear weapons as an essential contribution toward a strong defense. On the other side were assorted clerics, teachers and malcontent critics. They were seen to oppose nuclear weapons and by extension to display an emotional rejection of war of any kind for any purpose....Both groups talked past each other, no dialogue occurred and the nuclear arms race went on (1984: ix).

During those forty years, there existed among the defense strategists responsible for nuclear policy an essentially consistent view of the United States' nuclear weapons and of the adversary those weapons were intended to control. For the most part, except for a few critics, the public more or less delegated the responsibility for those weapons to the "experts" in the Pentagon and its ancillary research institutes and foundations. To the extent that they thought about such matters, the majority of the public in effect accepted the defense strategists' representation of the world in the nuclear age. That world-view became institutionally entrenched in the political, military, and social organizations which designed and executed America's nuclear policy.

In recent years, however, new voices — new representations of superpower intentions, capabilities, and relations to each other and their weapons — have begun to be heard, in great part as a result of the failure of the traditional defense establishment paradigm (Kuhn 1962) of

nuclear relations to adequately account for the facts of the nuclear arms race. Some of these new voices have challenged the paradoxes of the traditional paradigm, asking, for example, how the policy of deterrence — and its underlying assumptions about nuclear weapons and superpower relations — can be valid when it creates a spiralling arms race which makes more and more likely the confrontation and exchange it proposes to prevent.

Political enfranchisement of these new voices — new modes of nuclear discourse — would enrich and enhance the nuclear arms debate by testing traditionally held hypotheses with new perspectives and facts. But the purveyors of the traditional paradigm are so far essentially unwilling to engage alternative modes of discourse in meaningful dialogue. So far, there has been what Michael MccGwire (1984: 76) has called "a dialogue of the deaf." And this has worked to the detriment of the superpowers' nuclear policies and the world's nuclear stability. Without the fresh input of alternative modes of discourse about nuclear issues,

[t]hose who are engaged in the pragmatic policy process of incremental decision-making and implementation are inevitably encased in a perceptual tunnel, where the theoretical analyses determining direction and depth have to be accepted as valid, and assumptions (to the extent they are even recognized) are taken as given (MccGwire 1984: 76).

It is in response to this dilemma that some recent research, of which this study is a part, has sought to identify the differences between different modes of discourse, to analyze their common and disparate underlying assumptions as well as their linguistic variation, in order to affirm the legitimacy and potential contribution of alternative nuclear discourses and thereby enhance real communication between old and new discourses.

Wertsch's "Modes of Nuclear Discourse"

James Wertsch (1987), in a paper entitled "Modes of discourse in the nuclear arms debate," proposes an initial typological classification of patterns of thinking and speaking about nuclear issues varying along two dimensions — a dimension of the author's "scope of identification" and a dimension of the form of legitimation" privileged by the author. Wertsch defines scope of identification as "the group with which one identifies when engaged in discourse about nuclear arms," ranging from the individual to all humankind. Within this dimension, Wertsch proposes the crucial distinction between a "'universal" and a "nonuniversal" perspective — "between taking all of humankind as opposed to some subgroup as the group which one identifies" — as most important (1987: 5). Wertsch then distinguishes between two forms of legitimation:

A reified form of legitimation privileges the use of formal logic. It represents reality in terms of abstract categories, and it grounds reason in logical operations that hold regardless of the concrete particularities at issue. In this sense it is decontextualized. In contrast, nonreified thinking is more context-specific. Instead of trying to code situations in terms of abstract logical categories, it privileges context-specific factors, particularly their emotional aspects (Wertsch 1987: 6-7).

The intersection of these two dimensions yields four modes of discourse:

Universal, nonreified discourse proceeds from "the assumption that all humankind is the relevant scope of identification and that the form of legitimating one's arguments is not formal, decontextualized logic" (1987: 8). For Wertsch, the writing of Helen Caldicott typifies this mode of discourse.

Universal, reified discourse proceeds from a different set of assumptions: "Instead of accepting a universal scope of identification as a basic tenet, it typically arrives at the notion that 'we are all in this together' through the dictates of a decontextualized logic" (1987: 9). Wertsch offers the writing of Carl Sagan on "nuclear winter" as an example of this mode of nuclear discourse.

Nonuniversal, nonreified discourse identifies with some group — often the nation, but sometimes a local community or even the immediate family — rather than with all humankind, and fosters an "us versus them" mentality, making an emotional, context-specific appeal. Movies like "Red Dawn" and books telling readers "How to survive the coming nuclear war" typify this mode of discourse.

Finally, **nonuniversal, reified** discourse, exemplified by much of the official national security rhetoric in both the United States and the Soviet Union, assumes that the superpowers "exist in an adversarial relationship"; further, this mode of discourse assumes that one side can "win" a nuclear war. This assumption leads to the quantitatively based argumentation epitomized by Herman Kahn's *On Thermonuclear War* and the game theory and systems analysis approaches of the RAND Corporation.

The purpose and value of Wertsch's typological approach lies in its attempt to account for how these four modes of nuclear discourse can be all but mutually incomprehensible to each other — creating dangerous "misreadings" of others' intentions and beliefs, blocking some forms of nuclear discourse from politically effective participation in the dialogue, and thereby handicapping the nuclear arms debate. This study seeks to identify which sets of linguistic features contribute to these opposing styles of nuclear discourse, as well as their varying rhetorical functions and ideological foundations. This knowledge may then create a broader metacommunicative basis for communication and understanding between the various stands on questions of nuclear policy. The "real-world" goal of the study has theoretical ramifications as

well — identification of some aspects of the relation between the functional aspects of an author's style and her/his world-view.

The Relation of Author's Style and World-View

The first major premise of this study is that significant aspects of an author's "style" — defined simply as a set of systematic linguistic choices made by a writer — can be captured and characterized quantitatively, by measuring the frequency of the author's use of a variety of lexical and syntactic features. An author's style is influenced by many things, but particular aspects of her/his style are influenced by the author's "world-view," in this case, as it specifically relates to the nuclear arms debate. I will show that aspect of an author's beliefs and assumptions about the relations between the United States and the Soviet Union, between the superpowers and their nuclear arsenals, and between all members of human society can not only be discerned from her/his writing (few readers would deny this claim), but are indicated in some of the quantitative indices of that author's style.

In other words, as *stilus virum arguit*, "the style proclaims the man," so does style proclaim many of the author's (often unstated) beliefs about her/his topic. Most studies of style have concentrated on fiction by well-known authors, reasoning that the conscious artistic manipulation of language toward some end will enable more successful analysis of the author's apparent fit between form and function. However, if we assume that writers in the nuclear arms debate are not the conscious craftspeople that fiction writers are, we can more strongly assume that any individual styles observable in nuclear discourse texts are less conscious than that of a fiction writer's product and more attributable to the authors' view of the subject of nuclear arms and international relations and the way in which s/he wishes the reader to view the subject. There is a wedding of perspective and purpose between the author's beliefs and her/his rhetoric.

Morton and Levison's (1966) claim that it is possible to distinguish between texts written by two different authors — even where a conscious effort has been made by one author to imitate the other — relies on the implicit assumption that an author's unique complex of experiences, beliefs, and attitudes uniquely affects her/his writing; there is a complex cause-effect relation between the author's relation to the world and the choices s/he makes while creating a textual

'stylistic competence' .. a sense of what is usual or unusual or noticeable in language [which] is built up from a lifelong experience of linguistic use..." (Leech and Short 1981: 49). The speaker/hearer and the reader have normative expectations for the type of language used in a given speech event and context. These expectations are a source and product of the "language socialization" of every member of society (Ochs and Schieffelin 1983), a part of her/his grammatical and communicative competence (Hymes 1971). It follows that a crucial part of every member of society's linguistic competence is, in some sense, statistical — that is, able to recognize norms of behavior and relative degrees of deviation from those norms. It seems likely that the form in which those norms are constructed, stored, negotiated and reconstructed over time is somehow quantitative (although the algorithm of recognition and evaluation of frequencies of behavior patterns — linguistic or otherwise — is certainly not conscious).

The use of particular linguistic features indexes, directly or indirectly, different information — about contexts of communication, about roles of participants, about relations between participants, about the content and context of interaction, and so on (Silverstein 1976). But it is not sufficient for a speaker or writer to use, for example, one linguistic feature which (partially) indexes informal relations between participants; it is the relative frequencies with which various sets of cooccurring indices are produced, the relative "attention" paid to different kinds of social information, which provide much of the data against which and through which the grammatical, semantic, and propositional content of a given utterance is interpreted. In other words, a major role in a member of society's communicative competence is played by a sort of "probability calculator," which is socially "programmed" and "re-programmed" throughout the member's life. Fodor (1965: 75) explains that, in language

the quantitative relations cannot be separated from the qualitative ones...all things and processes constitute a unity of quantity and quality, therefore explaining them through their quantitative side one reaches the qualitative manifestations too, and further,...every qualitative relation can be represented by quantitative, mathematical means.

The conceptual categories (qualitative relations) which constitute an individual's world-view are perceptible in the stylistic indices (quantitative relations) of that individual's use of language, the main human medium for experiencing and making sense of the world.

A major part of the process of interpreting another's remarks (written or verbal) is an assessment of the relative attention paid by the producer to various indices marking different types of social, contextual information — including especially those marking the speaker's relations to the referential entities in her/his text. This assessment must resort to a set of interrelated standards for each of these indices in order to guide and inform the reader/hearer's interpretation. These standards are the individual's personal versions of culture-wide norms.

Think of each norm as a scale; the intersection of the individual norms held by all members of a society can be considered a set of cultural mean values for those norms, but the standards of individual members of the society relative to each of these norms fluctuate around these mean values.

Two aspects of the negotiation of world-views through language are of interest here. Every time you read a text on a particular topic — say, nuclear arms control -- regardless of whether you agree with it or how much it affects your conscious position on nuclear issues, the standards you apply in appreciating nuclear discourse which you have experienced in the past and the expectations you will carry to nuclear discourse you might encounter in the future are (gently or radically) revised as a result of your experience with that text. On the conscious level you might even compare a text read before with the one you've just finished: one might seem calmer, the other more shrill; one might seem more coldly rational, the other more emotional; one might assume irreconcilable differences between superpower interests, the other a community of common interest.

As your sense of the manner (or style) of nuclear discourse is influenced by a text, so is your view of the nuclear arms debate, of the world. The influence may be great or small (depending on a variety of factors), but it is unavoidable because at least for the time you were reading the text, in order to comprehend the text you necessarily adopted, however provisionally, some aspects of the author's textual representation of the world. This in not to argue that you, the reader, did not participate in constructing an interpretation of the text -- far from it. But to the degree that the author's view of the world apparently differed from your own, you had to seek and adopt that view in order to understand the text. Leech and Short (1981: 125) speak of this process as an interaction between models of the world: "... when we inform someone by means of language we retrieve a message from our own model of reality and by means of encoding and decoding of language transfer it to the addressee, who then fits it into his own model of reality."

The assumptions on which this study is based may be summarized as follow: first, the style of a text — that is, the consistent lexical, semantic, and syntactic choices which an author makes — reflects that author's view of her/his subject. Fowler (1977: 76) calls this the author's "mind style": "[c]umulatively, consistent structural options, agreeing in cutting the presented world to one pattern or another, [which] give rise to an impression of a world-view,..a 'mind style.'" Second, an author's (or a genre's) style can be quantitatively assessed, first by analysis of the frequencies of cooccurring features in the text and then by using these frequencies as a guide to microanalysis. Leech and Short (1981: 258) state that:

For all texts,...there is usually one addresser but a large number of addressees, the vast majority of whom the writer has never met. Literature is thus a kind of discourse where the writer can assume relatively little about the receiver of his message or the context in which it will be received.

One result of the relative uncertainty of the situational context of the literary message is its degree of redundancy. In order to make sure that the point is put across the novelist tends to say the same thing in a number of different ways, and at different levels of structure.

While the author of nuclear discourse, in attempting to get her/his message across, may not as consciously ply several levels of structure as the novelist, it seems reasonable that the conscious and subconscious choices made at one level will be echoed at other levels, even if no conscious effort is made in this direction. The text of an author with a particular world-view is not likely to assert that world-view on one level of structure — say, that of lexical choice or pronominal reference — and contradict it at another level — say, that of syntactic structure. Some of the quantitative indices of an author's style should also index some of the assumptions of that author's thinking and writing. For example, an author's preference for agentless passives when writing of preferred nuclear arms negotiation approaches may be indicative of a tendency to view such negotiations in the abstract, de-emphasizing the role of such real-world factors as the personalities of the human agents participating in the talks themselves.

Database

For this pilot study, samples from four texts were selected which, impressionistically, represent three of the four modes of nuclear discourse proposed by Wertsch (1987).¹

Herman Kahn's *On Thermonuclear War* is suggested by Wertsch as a representative of the "non-universal, reified" mode;

Helen Caldicott's *Missile Envy* is selected by Wertsch to represent the "universal, non-reified" mode;

Freeman Dyson's *Weapons and Hope* and Admiral Noel Gayler's essay, "The Way Out: A General Nuclear Settlement," were chosen as probable representatives of the "universal, reified" mode.

The fourth, "non-universal, non-reified" mode of nuclear discourse — Wertsch gives Cruik and Cruik (1982) *Survive the Coming Nuclear War: How to Do It* as an example — was excluded from this study because it explicitly assumes the event of a nuclear holocaust rather than discussing ways to avoid it and therefore does not participate in the debate under examination here.

Each of the texts was chosen for reasons beyond their apparent classification in a typology of nuclear discourse. Each text represents a potentially strong voice in the nuclear arms debate. Kahn's text was chosen because of his seminal influence on an entire school of nuclear

strategic theory which survives him in the work of the RAND Corporation and his own research foundation, the Hudson Institute, and which is a major part of the currently "dominant" voice of the defense establishment. His ideas about "winnable nuclear war" and minimization of the consequences of a nuclear attack have significantly influenced the policies of the Reagan administration, as evidenced by the Strategic Defense Initiative ("Star Wars"), the public statements of Secretary of Defense Caspar Weinberger (1986), and the assertion of Thomas K. Jones, Deputy Under Secretary of Defense for Strategic and Theater Nuclear Forces, in 1981 that "...if there are enough shovels to go around, everybody's going to make it [through a nuclear war]." Dr. Helen Caldicott's text was selected as providing a strong contrast to Kahn's quantitative approach to the nuclear arms debate. Caldicott voices what Dyson calls the "victims" view of the nuclear dilemma. She has been one of the most visible opponents of the current nuclear arms policies of the United States and positions herself in direct opposition to military strategists.

The choices of Dyson's and Gayler's texts were motivated by the backgrounds of the authors: Dyson was selected as representative of a growing number of scientists (especially physicists) who have publicly addressed the social and political responsibilities of nuclear technology and who may represent an academic perspective on the problem of international relations in the nuclear age. The program expounded in his text is based on the testimony of Donald Brennan, a researcher at the Hudson Institute, so Dyson's text may represent aspects of both the academic and the "techno-strategic" perspective.

Finally, Admiral Noel Gayler's text was selected to represent one viewpoint of the military establishment. His public opposition to unrestrained nuclear build-up may place him outside the fold of what Caldicott calls the "Iron Triangle" of Congress, the Pentagon, and the military-industrial complex, but it is likely that a lifetime in the military has influenced his view of nuclear issues to some extent.

Three of the four texts are relatively current, published in 1984; the exception is Kahn's book, published in 1961. It was included in the study because it has been a very influential, almost archetypal example of the school of thought which it, in great part, initiated and which survives today as the most empowered voice in the nuclear arms debate.

From each of the four texts a passage of approximately 1700 to 1800 words was selected which seemed to most concisely and comprehensively encapsulate the author's proposal for survival in the nuclear age. The selection was made on this basis to minimize the confounding influence on the analysis of varying topics (which random sampling from each text would almost certainly have produced). This decision has disadvantages: for example, Helen Caldicott's description of the local effects of a nuclear blast, which is one of the most affecting parts of her book and which constitutes a major part of her argument, is not analyzed. The sample of her text which was analyzed may, therefore, not accurately represent her overall style — and, of course,

the same may be true of the other three text samples. In spite of this limitation, the passages selected from each text are a part of that text, and their content and style are informed by, and, in turn inform the content and style of their surrounding text; they do represent at least one facet of their authors' respective styles and world views.

A limitation of the present analysis is the small number of texts analyzed. However, the small database allows close micro-analysis of the larger quantitative findings to discern the functional roles of particular features and/or sets of features in each text. It therefore contributes to the accuracy of future research on a larger database, consisting of more texts from a wider range of nuclear discourse texts with more samples from each text, which must be analyzed to accomplish the aims of this program of research:

to accurately characterize the sub-genre of nuclear discourse in terms of variation of linguistic features;

to describe the relations of this sub-genre to other genres of spoken and written English (or its relation to other "text-types" of English, see Biber and Finegan 1986);

to assess with greater validity the extent to which Wertsch's proposed typology of nuclear discourse can be identified linguistically; and

to enhance the explanatory power of a typology of nuclear discourse and its mediating potential in the debate over nuclear stability and survival.

Methodology

The method for analyzing and comparing the four texts in this study is a "multi-feature/multi-dimensional" statistical approach developed by Douglas Biber at the University of Southern California (1985, in press). Biber (in press) analyzes the distribution of 67 classes of lexical and syntactic features in 481 spoken and written texts in English across 23 genres to investigate differences between spoken and written texts. The spoken texts were taken from the London-Lund Corpus of Spoken English (Svartvik and Quirk 1980), which is comprised of 87 spoken British English texts of about 5,000 words each, across a number of different speech situations. The written texts were selected from the Lancaster-Oslo-Bergen Corpus of British Written English, which is drawn from printed sources published in 1961; there are 500 text samples of approximately 2,000 words each, across 15 genres, totalling about one million words of running text (Johansson, Leech, and Goodluck 1978, Johansson 1982).

Biber, in the course of a series of studies (Biber 1984a, 1984b, 1985, 1986a, 1986b, Biber and Finegan 1985, 1986, Finegan and Biber 1986), developed computer programs to tag each word in the texts in these computerized corpora and further programs to count specific lexical and syntactic features — selected for their potential functional importance — in the texts. These counts were then analyzed using a multivariate statistical technique called factor analysis.

Essentially, this type of analysis clusters linguistic features which cooccur in the texts with a high frequency into groups or factors. Cooccurring features share common functions (Ervin-Tripp 1972), so the groups/factors of cooccurring features are interpretable as textual dimensions along which a text may be located by its frequency of use of the features which constitute that dimension. A factor typically consists of a group of features which cooccur at one end of the dimension (positive-loading features) and another group of cooccurring features which are in complementary distribution to the positive-loading features (negative-loading features).

The second step of the analysis allows different texts to be compared by their relations to each other on the dimensions derived from the factor analysis. The factor scores for each text on each dimension is derived simply by subtracting the sum of the Z scores of all negative-loading features from the sum of the Z scores of all positive-loading features in a given text. The textual dimensions derived from the factor analysis can then be interpreted more carefully in light of the relations among genres along the dimensions. (For a more detailed explanation of this method of discourse analysis, see Biber in press.)

This study employs Biber's multi-feature/multi-dimension approach to analyze the samples of the four nuclear discourse texts. The factor scores on each textual dimension for each nuclear discourse text are derived; this allows the evaluation of (a) the relations between the nuclear discourse texts, (b) the relations between each nuclear discourse text and the genres analyzed by Biber (in press), and (c) the relations between nuclear discourse — as a sub-genre — and the other genres. It provides a very specific linguistic characterization of the four nuclear discourse texts and a first step toward characterizing the sub-genre of nuclear discourse. The analysis also yields each text sample's frequency of use of a large variety of lexical and syntactic features, allowing analysis of the types of features most exploited in each text. These patterns of selective exploitation of verbal and rhetorical resources are a window to some aspects of the author's world-view. The factor scores of the nuclear discourse texts and the analysis of their use of specific linguistic features also provide a more specific initial characterization of the modes of nuclear discourse proposed by Wertsch (1987) and may suggest amendments to the dimensions of variation which constitute his typology.

It is important to understand the role of quantitative analysis in this study. The multi-feature/multi-dimension statistical approach identifies cooccurrence patterns across a large number of texts and allows the relation between individual texts to be indexed along functional dimensions of cooccurring linguistic features. These dimensional relations between texts are not the end result of the analysis, but rather a first step in the analytic process. The quantitative results provide an objective description of texts in relation to each other *on the same scales*, and the quantitative differences between texts motivate and direct the microanalysis of each text by posing questions: Why do these texts differ? If cooccurring linguistic features serve a similar

function, how do these texts vary in their functional approaches to their topic and their task? And how might that variation be influenced by differing views of the subject matter itself, by some aspects of the author's world-view.

Results

Biber (in press) finds six dimensions of variation in spoken and written English. In the following sections, the positions of the nuclear discourse texts along three of these dimensions — Dimension 1: "Involved Versus Informational Production," Dimension 4: "Overt Persuasive Effort" and Dimension 5: "Abstract Versus Non-Abstract Information" — are presented and discussed, and the functional roles played in the texts by the features which account most for the texts' position on these three dimensions are considered. The possible relations between the quantitative results and the world-views of the authors of the texts are discussed.

Dimension 1: "Involved versus Informational Production"

Biber (in press: 134) interprets the first of the factors produced by statistical analysis as a dimension defined by poles of language use for primarily "informational" versus primarily "involved" purposes — "high informational density and exact informational content versus affective, interactional, and generalized content." Two concerns are posited to underlie this continuum, the writer/speaker's purpose (informational versus interactional) and the context of language production (the presence in production of the text of editing opportunities versus real-time, unedited speech production).

The frequencies of 28 classes of features contribute to this factor; most relevant to this study are the following:

Positive-loading features (more involved):

private verbs: e.g., *think, feel, believe*;
 present tense;
 analytic negation: *not*;
 general emphatics: e.g., *so + ADJ, really, most*;
 impersonal pronoun: *it*;
 general hedges: e.g., *almost, maybe*;
 possibility modals: *can, may, might, could*;
 amplifiers: e.g., *completely, entirely, totally, very*;

Negative-loading features (more informational):

nouns;
 prepositions;
 attributed adjectives.

The features constituting this dimension of variation appear to indicate different rhetorical strategies in nuclear discourse which, in turn, provide some insight into the authors' views of nuclear arms issues — their biases, priorities, etc.

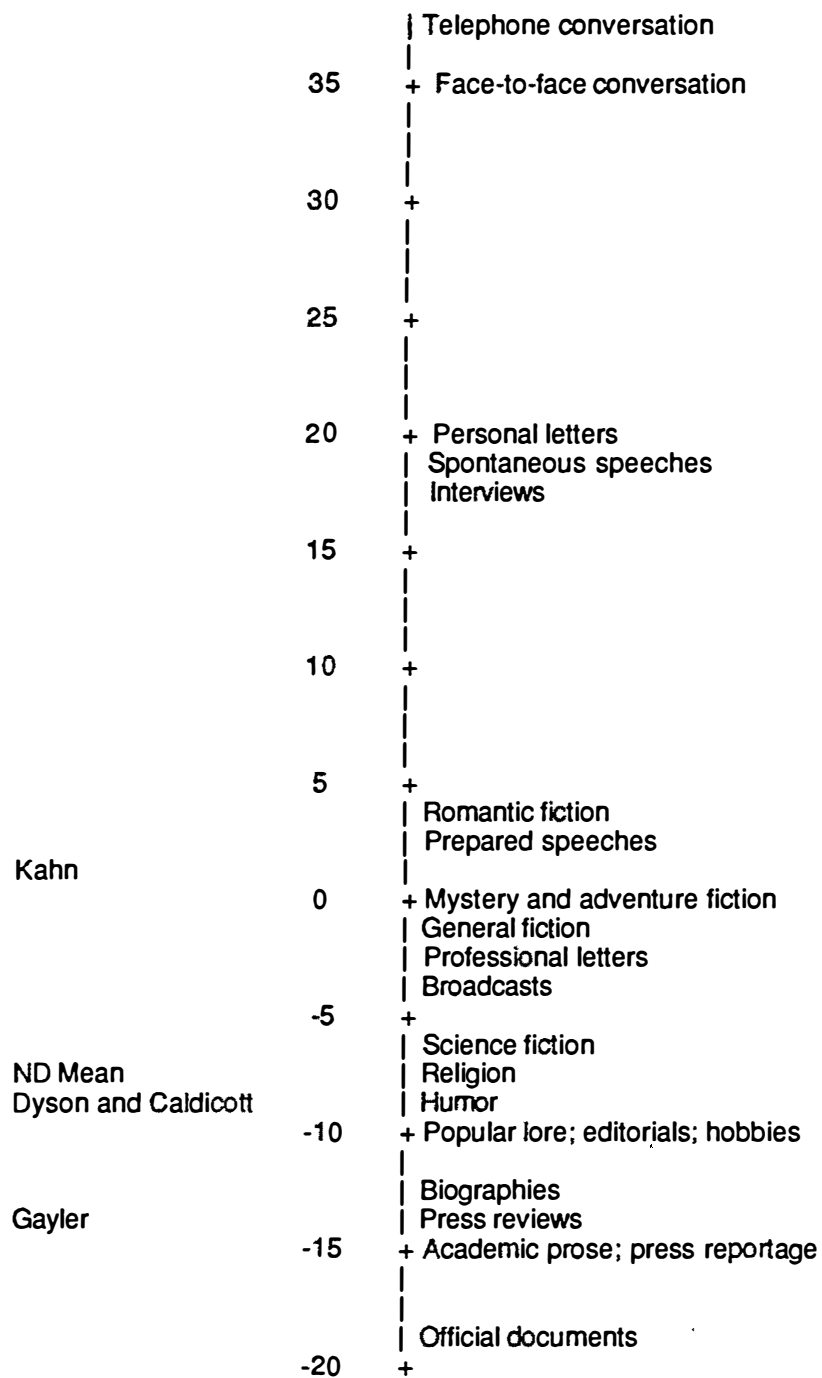
The Factor 1 scores of the four texts analyzed, in descending order from most "involved" to most "informational" were:

Kahn:	0.962
Dyson:	-9.082
Caldicott	-9.094
Gayler:	-13.786
mean:	-7.750

Biber's factor score scale for Dimension 1, "Involved Versus Informational Production," is reproduced on the following page, with the placement of the nuclear discourse texts added for comparison with the other genres.

Figure 1: Mean Scores of Dimension 1 for Each Genre

(adapted from Biber in press: 199)



Kahn's text was distinguished from the other three nuclear discourse texts by the highest measure of "involvement," while Gayler's text was the most "informational" of the four texts.² The difference between the factor scores for these two texts was 14.748 or approximately 27 percent of the total range of variation among all the genres along Dimension 1. To see what the features identified by factor analysis as constitutive of Factor 1 were "doing" in the two most contrasting texts, paragraphs from Kahn's and Gayler's texts are reproduced below. Those features with a positive loading on Factor 1 (more interactional) are underlined; features with a negative loading on Factor 1 (more informational) are printed in bold-face.

Kahn:

The uninspiring nature of the mutual suicide concept may eventually affect the morale and efficiency of our military forces. Many military and civilian officials who have been excessively preoccupied with the notion of pure deterrence have remarked to me, in effect, that they do not really care how the war comes out; some have even added that they do not really care once deterrence has failed if our buttons are actually pushed. This position is not very far from the one of not worrying if the buttons are not connected so long as they appear as if they are. And if one looks soberly at many of the **quick-reaction schemes that are proposed**, he notices that they are so prone to accident or false alarm that we could only live with them if the buttons were not connected. It is then argued that this does not matter because the enemy surely will not rely on their not being connected. I do not believe it is necessary to say how dangerous such an attitude can be. Such sloppiness may pervade all aspects of any operation that is trying to keep, to a continuous and instantaneous high level of efficiency or capability, equipment and organizations that will only be used in a very remote contingency; yet if that contingency occurs, we really do not care how it operates.

Gayler:

Finally, we and the Soviets need to make deep, fast and continuing cuts in the numbers of nuclear weapons of all kinds. **Stockpiles at the present level are** ridiculously excessive to any reasonable needs for deterrence; even more excessive are the plans of each country to build many thousands of new weapons in the next few years. The sheer numbers carry obvious danger: the risk of accident is at least proportional to the numbers of weapons; so is the risk of unauthorized firing and the vulnerability to hijacking.

These two excerpts are representative of the texts from which they are drawn. Gayler supports his point — the need for significant arms reductions — by citing several dangers of stockpiling nuclear weapons which, although certainly related to each other, are sufficiently distinct from one another to require full noun phrases and allow little pronominalization. Contributing to the highly nominal form of Gayler's text is his habit of using attributive adjectives and prepositional phrases (which often indicate the modified noun's value) to more specifically identify or qualify the referents of noun phrases. This leads to such complex noun phrases as "deep, fast and continuing cuts in the numbers of nuclear weapons of all kinds."

Kahn, on the other hand, exploits a very partisan perspective on the issue of nuclear stability which allows him to use fewer nominal forms (nouns, prepositional phrases, attributive adjectives). This relative infrequency of nominal ("informational") forms contributes a great deal to the sense of interpersonal involvement in his writing. Several consistent rhetorical choices enable him to reduce the nominal, "informational" element in his text.

By setting up a polar contrast between "us" (people for a strong, well-armed United States) and "them" (people *not* for a strong United States), Kahn is able to introduce a noun phrase once and then refer to it repeatedly from various perspectives through pronouns. For example, the excerpt above is almost entirely *non*-nominal except for the first and last sentences. The topic of the paragraph — pure deterrence's problematic mirror-image as a mutual suicide pact — is discussed through reporting how it affects "them" — the officials who are excessively preoccupied with this strategy. When a noun phrase is required for cohesiveness, it remains, for the most part, unembellished by attributive adjectives or qualifying, specifying prepositional phrases (e.g., "This position," "the buttons," "the enemy," etc.).

The relative sparseness of Kahn's noun-phrases also contributes to an air of objectiveness about his writing. A noun phrase containing an attributive adjective also contains a "covert" proposition; for example, Gayler's noun phrase "a reasonable need for deterrence" presupposes the proposition "the need for deterrence is reasonable." By using fewer prepositional phrases, which often qualify their head noun, Kahn also states his claims in broad, general terms which may be more difficult to discredit because they are less vulnerable to specific counterevidence.

Kahn also reduces his reliance on noun phrases for reference by using agentless passives (e.g., "It is then argued that...") which introduce a proposition without direct reference to the source of the proposition. When used to introduce viewpoints which he opposes, this strategy has the rhetorical value of suppressing direct reference to the opposition; this ploy is familiar in advertising where a traditional rule is "Never say the name of Brand X." Use of the agentless passive also forces the reader to temporarily assume the author's position in the polarity between "us" and "them" in order to assign reference to the source of the proposition.

Temporarily and provisionally, the reader must share Kahn's "non-universal" scope of identification; the experience is reinforced repeatedly so that it is reasonable to believe that it has the potential to affect the reader's own world-view in at least two ways. It may inspire the reader to move closer to Kahn's non-universal perspective. More probably, it creates a primary heuristic for the reader to view the world and Kahn's textual representation of the world which, once provisionally adopted by the reader, makes the reader less critical of the arguments which are based upon that perspective or whose comprehension relies on assuming that perspective. Once the reader has assumed an "us versus them" framework for viewing subsequent claims,

those claims are less vulnerable to criticism than if the reader did not initially "buy into" the primary polarized framework. This is not to claim that a reader is brainwashed by a text; the effect is small and incremental to the frequency of the device, and the reader's own perspectives, beliefs and experiences crucially contribute to his or her interpretation of the text and the manner in which it affects her/him. But the effect of the text still exists. A corollary of the claim that aspects of an author's world-view may be discernible in his or her frequency of use of various linguistic features is that that world-view may be more or less forcefully communicated to — even thrust upon — the reader *through* the frequency of use of particular features.

Many of the positive-loading Factor 1 features which Kahn's text uses more frequently than the other three texts not only contribute to a sense of involvement but also seem to exploit that sense of involvement for persuasive ends. Private verbs consist of verbs which express intellectual acts or states (Quirk et al. 1985: 1181-1182). On the one hand, private verbs can be used to invite the reader to share the state of mind or perspective of the author (as in "I do not believe it is necessary to say how dangerous such an attitude can be"). Kahn's frequent use of private verbs seems to be partially enabled by his polarization of "us versus them." "Us" includes the author and the reader; they are the ones viewing the problem together. Therefore, the use of a private verb, by representing the belief or thought of the author, implicitly claims to represent the thought of the reader as well. This close identification of author and reader allows Kahn to carry the reader with him along the logical steps of his exegesis. In fact, in facing what Kahn admits are terrible choices and cruel facts, this identification of the author's and the reader's perspectives is crucial; Kahn's facts must seem to the reader incontrovertible, his logic unassailable.

Biber (in press: 67) states that "present tense verbs deal with topics and actions of immediate relevance" and, in academic writing, can be used "to focus on the information being presented and remove focus from any temporal sequencing." In Kahn's sample, the focus is often on the Soviet threat (increased by America's own incorrect strategic policies) and the frequent use of verbs in the present tense indicates the immediacy of that threat to Kahn, and thereby communicates it to the reader. Kahn also frequently builds hypothetical scenarios to develop and support his points; these scenarios are posed in the present tense, dramatizing their possibility, heightening their affective impact, and attenuating their hypotheticality, making them seem more "real." In contrast, Gayler more frequently uses the past tense to report past events and attitudes toward nuclear issues and to contrast them with aspects of his own proposal. The attendant requirement of temporal sequencing of these events and attitudes may dilute his focus (and therefore the reader's) on the strengths or flaws of those past attempts at nuclear arms reduction, emphasizing the results (failure) at the expense of the causes of those failures.

Although frequent use of the impersonal pronoun "it" often marks a relatively inexplicit lexical content in spoken language (Biber 1986a, see also Chafe and Danielewicz 1986), frequent

use of "it" in writing, precisely because it can stand for almost any referent, also may indicate a high degree of cohesiveness in the text (which aids in the recovery of the referent of "it") and a high degree of confidence on the part of the author that the reader will be able to recover the referent of "it". The frequent use of "it" may, in turn, contribute to an overlapping or converging of author's and reader's perspective and could, conceivably, contribute, however subconsciously, to the persuasiveness of the text. Where the author is less explicit, the reader must take more responsibility for her/his interpretation of the text. Gayler's frequent use of full noun phrases may allow the reader to maintain distance from Gayler's perspective on the nuclear dilemma, whereas Kahn's relatively inexplicit (more pronominal) style forces the reader to assume Kahn's perspective (at least provisionally) in order to comprehend the text.

Three other positive-loading features on Factor 1 also have potential persuasive functions. Hedges mark uncertainty, but this uncertainty can be used to mitigate the extreme scope of a claim and thereby maintain the author's conviction in the claim itself. Chafe (1985) classes possibility modals as a type of evidential that marks reliability. Frequent use of possibility modals may therefore contribute to an author's credibility. Finally, amplifiers increase the force of the verb (Quirk et al 1985: 590-597) and affirm the reliability of propositions (Chafe 1985). They may also communicate solidarity with the interlocutor (Holmes 1984). All of these effects of the use of amplifiers, in addition to enhancing the sense of involvement of the text, may also contribute to the persuasiveness of the text.

As a final, general note, it is interesting that the mean factor score of these four nuclear discourse texts is closest to the mean factor scores of the genres of science fiction, religion, popular lore, and editorials (among others). There is a clear element of each of these genres in written nuclear discourse, which is motivated by the possibility of an event — nuclear war — which is so monstrous that it is almost unimaginable, and which therefore inspires an almost religious fervor in those writing about the problem. Because of its complexity, the issue is simplified by authors, creating "recipes" for strategic superiority or arms control which have the flavor of popular "how-to" literature mixed with the persuasive effort and impact of partisan editorials.

"Us" versus "Them"

One of the most distinctive features of Kahn's text sample is his low frequency of nouns (177 per 1000 words compared to 195, 215 and 225 per 1000 words for the text samples of Gayler, Dyson and Caldicott, respectively). As mentioned above, one aspect of Kahn's text sample which appears to contribute to the relatively low noun frequency is the creation of a polarized domain of reference — "us" versus "them." To explore the role of this kind of schemata further, the referents of the pronouns "we" and "us," on the one hand, and "they" and "them," on

the other, in each of the four text samples were identified and counted. These pronouns may serve as an indirect index of the general "deictic" placement of referents in each author's world-view: the more frequently a referential entity is referred to as "we/us" or as "they/them," the more salient that entity is assumed to be in the interpretive map offered by the author. Referring to an entity as "we/us" identifies the author — and often the reader — with that entity; referring to an entity as "they/them" distances author and reader from that entity. This pronominal polarization is therefore apparently one of the ways in which an author makes known her/his position on Wertsch's "scope of identification." In addition, the use of these pronouns — rather than full noun phrases — requires greater interpretive effort on the part of the reader to correctly assign reference to the pronouns; to do so the reader must, at least provisionally, take the author's perspective. Therefore, the use of such pronouns is a subtle form of persuasion, involving the reader in the author's world-view.

The frequencies with which each author's text sample referred to particular entities as "we/us" and "they/them" are given in Tables 1 and 2.

Table 1. Referents of "We/Us" (expressed as a percentage of total frequency of "we/us")

<u>Text Sample</u>	<u>US</u>	<u>USSR</u>	<u>US + USSR</u>	<u>Author + Reader</u>	<u>Other</u>
Caldicott	17	0	83	0	0
Dyson	80	0	10	7.5	2.5
Gayler	35	3	58	3	1
Kahn	76	0	0	24	0

Table 2. Referents of "They/Them" (expressed as a percentage of total frequency of "they/them")

<u>Text Sample</u>	<u>US</u>	<u>USSR</u>	<u>US + USSR</u>	<u>Leaders</u>	<u>Weapons</u>	<u>Other</u>
Caldicott	8	25	8	33	8	18
Dyson	0	13	0	0	67	20
Gayler	0	0	18	36	27	19
Kahn	0	57	0	0	0	43

Tables 1 and 2 provide a startlingly clear glimpse of each author's view of the "geography" of the nuclear arms issue. Caldicott identifies herself and her reader with a universal constituency, as suggested by Wertsch (1987); when she writes of "us," she almost always refers to both the

United States and the Soviet Union, and more specifically, to the *people* of those two countries. She most distances herself — through her use of “they/them” — from the leaders of both countries, especially their arms control negotiators. This is consistent with her main message — that the moral responsibility for arms control, having been for all intents and purposes abandoned by the superpowers' leaders (and even standing in opposition to many of their interests), necessarily devolves upon every individual, regardless of national origin. However, Caldicott's text sample refers to several entities as “they/them,” and establishes only a strong sense of identification through the use of “we/us,” leaving the identity of the opposition (“they/them”) less clear.

The notion of a polarized universe of discourse is least applicable, interestingly enough, to the text sample of the only military author analyzed in the study. Admiral Gayler refers most often to both the United States and the Soviet Union as “we/us,” and he is the only author who refers to the Soviet Union in one context (of reported speech) as “we.” Gayler's use of “they/them” refers to the United States and the Soviet Union (combined) on several occasions, but most frequently refers to the superpower leaders and to nuclear weapons themselves.

Dyson's text sample presents a more unambiguously polarized universe of discourse than either Caldicott's or Gayler's. He most frequently identifies with the United States as “we/us,” but the entity against which Dyson's “we/us” is most opposed is the nuclear weapons of all nations. The Soviet Union seems somehow incidental to the program which Dyson proposes, as he assumes that its leaders will respond in a rational, predictable way to changes in American nuclear policy.

Kahn's text sample, more than the other text samples analyzed here, creates a strong dichotomy between “we/us” — the United States, and “they/them” — the Soviet Union. Kahn emphasizes this distinction even more by his frequent use of “we/us” to refer to the author and his reader(s), as in “I should point out that the levels of damage and the postwar problems that we have just discussed might be an overestimate of what a retaliatory blow could or would actually do.” When Kahn writes of “we/us,” there is no question of the nationality of the people to whom he refers; although he does use “they/them” to refer to other entities besides the Soviet Union, the exclusivity with which he identifies “us” with the United States predisposes the reader, when searching for a referent to assign to “they/them,” to choose the Soviet Union and thereby participate in Kahn's distancing and alienation of that participant in the nuclear dilemma.

The importance, and salience, of these deictic references and their implicit scopes of reference has also been attested by Urban (1987) in a comparison of texts by Jonathan Schell (*The Fate of the Earth*) and Secretary of Defense Caspar Weinberger. The “scope of identification” chosen by the author is a critical aspect of the author's world-view. It strongly

influences the author's definition of "security" — whose security and of what kind — which is one of the most basic premises of any nuclear policy.

The main distinction among the four nuclear discourse texts along Dimension 1 is that between Kahn's text sample and the other three text samples. Recalling Wertsch's characterization of Kahn's "mode" of nuclear discourse as "non-universal, reified," we can see that several of the features which contribute to the indexing of a text as "involved," in Biber's (in press) terms, are directly related to Kahn's non-universal "scope of identification." The apparent low emphasis on informational production of his text sample (i.e., his relatively low noun, prepositional phrase and attributive adjective frequencies) are, to a great extent, a (by-)product of his clear-cut distinction between the United States and the Soviet Union, most salient in the referents of "we/us" and "they/them" in his text.

Kahn's choice of a reified "form of legitimation" may also be indirectly indexed by the greater degree of involvement demonstrated in his text sample. Much of Kahn's argument depends upon distinguishing between levels of damage that, by his own charge, most people don't have the courage to confront. In fact, one of the most striking of the many tables in *On Thermonuclear War* is entitled "Tragic but Distinguishable War States." In the text sample analyzed in this study, he points out "the enormous (though usually unrecognized) difference in a situation in which action by the U.S. might cause us to incur, say, 50 to 100 million casualties, and one in which they would be in the 2 to 20 million range." To soften the decontextualized (some might say "inhuman") abstractness of his reasoning, Kahn may have cultivated a more "involved" style, allowing him to "get closer" to the reader at the same time as he, regrettably but necessarily, pointed out the hard choices which (from his point of view) must be made.

Dimension 4: "Overt Persuasive Effort"

Biber (in press) interprets Factor 4 as a dimension measuring "Overt Expression of Persuasion." However, to avoid the assumption which this label seems to make about the perlocutionary effect of the linguistic features in this factor upon the reader, the name of the dimension for the purposes of this study has been slightly amended. The cooccurring features characterizing this dimension include:

infinitives;

prediction modals: *will, would, shall*;

suasive verbs: e.g., *ask, agree, decide*;

subordinating conditionals: *if, unless*;

necessity modals: *should, must, ought*;

split auxiliaries: e.g., "it is convincingly *shown* that..."

There are no negatively-loading features on this dimension, so the factor scores are determined solely by the relative presence or absence of the above features in the texts.

The factor scores of the four nuclear discourse text samples for Factor 4, in descending order from most overt to least overt persuasive effort are:

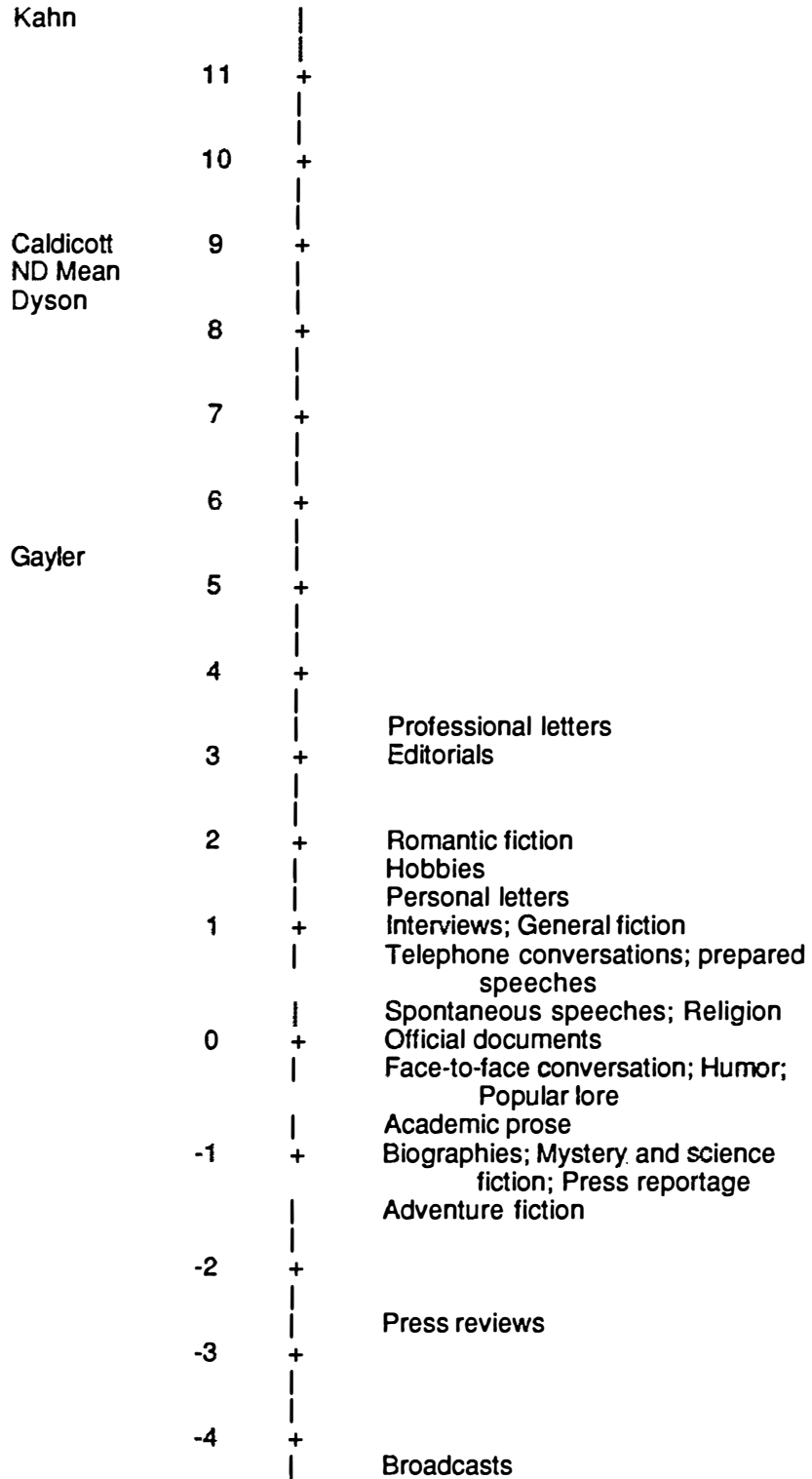
Kahn:	11.8464
Caldicott:	9.0348
Dyson:	8.5630
Gayler:	5.2481
mean:	8.673

Biber's (in press) factor score scale for Dimension 4 is reproduced on the following page, with the nuclear discourse text samples' placement added for comparison with the other genres.

The most noticeable aspect of Figure 2 is the tremendous difference between the factor scores of the nuclear discourse texts — individually and as a sub-genre — and all of the other genres analyzed by Biber (in press). It should be noted that each of the genres analyzed by Biber (in press) had a greater number of texts than the samples of nuclear discourse analyzed here, and the text samples in this study were specifically chosen on the basis of their content (i.e., a proposed solution to the nuclear dilemma), which almost certainly influenced their position on this dimension. In spite of these qualifying statements, it is still striking that the nuclear discourse texts should demonstrate nearly three times more "overt persuasive effort" than the nearest genre, professional letters.

The difference between the two most widely differing nuclear discourse text samples, those of Kahn and Gayler, is 6.5983, or approximately 40 percent of the total range of variation among all of the genres (including nuclear discourse texts) along Dimension 4; it is nearly equal to the total range of variation among all of the other genres along Dimension 4 if the nuclear discourse texts are excluded from consideration. The difference between the mean factor score of the nuclear discourse texts analyzed in this study and the mean score of the next highest genre, professional letters, is about equal to that between professional letters and the second lowest genre, press reviews. However, it is important to note that while the nuclear discourse texts are much higher on Dimension 4 than the other genres, there is nearly as wide a difference between the nuclear discourse texts as between professional letters and the broadcasts (the lowest scoring genre on Dimension 4).

Figure 2: Mean Scores of Dimension 4 for Each of the Genres
 (adapted from Biber in press: 202)



Excerpts from Kahn's and Gayler's text samples are presented below to compare their degrees of overt expression of persuasive effort. Features characterizing Factor 4 are underlined.

Kahn:

There is another possibility that should at least make military planners willing to study and evaluate seriously the civil and air defense of people and property. If (or I should say when) the Russians acquire an effective combination of civil and air defense that we cannot match, they will have an almost incredible advantage at some bargaining tables. Therefore, even though one does not, in the strict military sense, fight shelters with shelters or air defense with air defense, I feel that at a minimum we ought to have what I have called a Preattack Mobilization Base — to be prepared to go into a crash program either to match any corresponding Russian defenses or to counteract a Russian program of provocation. In addition, both our present and our future weapons systems should be examined to see how effective they would be against a Russia with an existing or plausibly modified civil defense system — one that has had a chance to exploit a few hours of warning, for example.

Gayler:

A fourth necessary element of a global nuclear settlement is a mutual moratorium on the further development, testing and deployment of nuclear weapons. The commonsense idea that we and the Soviets should not build up while we are trying to negotiate reductions has obvious validity. The difficulties have lain in major problems of verification, definition and negotiation which have led many to characterize a negotiated freeze as impractical. These difficulties can be avoided by a mutual informal moratorium by the heads of government on those many elements of a freeze that we can define and verify. An immediate possibility is a comprehensive test ban.

Of the six features indexing "overt persuasive effort" in texts, Kahn's text sample has the highest frequency on only three: predictive modals, subordinating conditionals, and split auxiliaries. In fact, his text sample contains the fewest suasive verbs of the four nuclear discourse texts (0, compared to Dyson's 11 per 1000 words; this is mainly due to a high incidence of reported speech in Dyson's text sample). Kahn ranks lowest (with Gayler) in frequency of necessity modals and second in frequency of infinitives (23 per 1000 words compared to Caldicott's 28 per 1000 words).

In order to have scored so much higher than the other nuclear discourse texts on the overall factor score, Kahn's frequency of use of the other three features had to be very high, and it was. To convey the concentrated frequency of these three features in a text sample only 1700 words long, their frequencies have been converted into Z scores (i.e., number of standard deviations) from the mean frequency of production of each feature by all the texts analyzed in Biber (in press). A text with a Z score of +1 on a particular feature has more occurrences of that

feature than 84 percent of all texts. A text with a Z score of +2 has more of the measured feature than 97.5 percent of all texts, and so on.

Although his text sample ranked second of the nuclear discourse texts in frequency of infinitives, Kahn's Z score for this feature was nearly +1.5 — that is, approximately 90 percent of all texts analyzed by Biber (in press) had a lower frequency of infinitives. Infinitives contribute to the sense of overtness of persuasive effort in a text because they "are generally non-factive... [indicating] possibilities and hypotheses, rather than known facts" (Leech and Short 1981: 104). When used in "purpose clauses" (Thompson 1985), infinitives presuppose the value of the act which they describe. For example, Kahn advocates a "Preattack Mobilization Base...to be prepared to go into a crash program either to match any corresponding Russian defenses or to counteract a Russian program of provocation." In this nest of embedded purpose clauses, the value or correctness of being prepared to go into the type of crash program which Kahn espouses is assumed and made relatively less vulnerable to challenge by the reader to the degree to which its value is presupposed. The degree to which propositions of purpose clauses are unavailable to negotiation makes them a covert form of persuasive effort: often purpose clauses serve as background for the main proposition of a sentence — e.g., that we should have "Preattack Mobilization Bases"; in order to understand the main proposition, the proposition assumed in the purpose clause must be at least provisionally accepted, and this acceptance makes the main proposition more acceptable as well.

The Z score for Kahn's frequency of use of predictive modals (14 per 1000 words) is +2.0; the nuclear discourse text with the next highest frequency of this feature, Caldicott's (9 per 1000 words), has a Z score of only + 0.80952. This result is not surprising. Kahn's text, far more than any of the other nuclear discourse texts, speaks of the future, assessing probable levels of damage given different policies, posing numerous hypothetical scenarios, and in general predicting complex chains of action and reaction between the superpowers. Caldicott's use of predictive modals, while still relatively pervasive, centers around one topic — what will happen if we do not achieve nuclear disarmament — and is therefore more limited. Both Dyson's and Gayler's text samples contextualize their proposals in the past. Gayler discusses why other approaches have failed and defends his proposal by favorable comparison to those past approaches; the logical support he musters for his proposal looks backward rather than forward. So too with Dyson's text sample. Much of his proposal is reported; he extensively quotes and paraphrases Donald Brennan, the defense analyst who conceived of the basis for Dyson's concept of "live and let live." When he does directly argue for the concept, the argument is often couched in present terms; since the concept is relatively constant over time, Dyson is able to speak of how the concept applies rather than how it will apply.

The Z score for the frequency of subordinating conditionals in Kahn's text (9 per 1000 words) is +2.95455; 99.9 percent of all texts analyzed by Biber (in press) had fewer "ifs" and "unlessees" than Kahn's text sample. This result is even more striking considering that the sample of Kahn's text analyzed in this study is comprised of only 60 sentences; if we assume only one conditional subordinator per sentence, 25 percent of his sentences contained a subordinating conditional. Kahn's preference for subordinating conditionals was shared by Caldicott, whose text sample contained 7 conditionals per 1000 words, with a Z score of +2.04545, higher than 97.5 percent of all texts analyzed by Biber (in press). In contrast, both Dyson and Gayler used very few conditionals (2 and 1 per 1000 words, respectively).

Conditionals, as their name suggests, place conditions upon the circumstances in which the proposition expressed in their main clause is true. It would seem that the qualifying aspect of conditional subordinate clauses — with its air of reasonableness and limited scope of claims — at least partially accounts for its appearance on a dimension of "overt persuasive effort."

More than any other feature on Factor 4, it is the very high frequency of split auxiliaries in Kahn's text sample that accounts for his high overall factor score. Kahn's text sample contains 17 split auxiliaries per 1000 words; his Z score for this feature is +5.0. In other words, the odds against another text having more split auxiliaries than Kahn's text sample are astronomically high. Both Dyson and Gayler have very high Z scores on this feature as well, +2.6 and +3.0, respectively. A split auxiliary places an adverbial in a very salient position; the adverbial often indicates some stance of the author toward the predicate or its complement. The overt attempt to persuade may be seen in sentences like "There is another possibility that should *at least* make military planners willing to study and evaluate seriously the civil and air defense of people and property."

Anyone who has read Caldicott's writing will remember her very emotional, affective style. It is striking that the text sample from Herman Kahn, who — like current defense strategists — argued explicitly that nuclear policies and strategies should be a matter of objective analysis and unemotional logic, should show the highest degree of overt persuasive effort. However, this result is also quite understandable. It is likely that Kahn recognized that his quantitative approach would be considered cold and inhumane. In fact, he somewhat proudly speaks of the ability to make these "hard choices" as something few people possess. The extraordinarily high indices of overt argumentation and persuasive effort in his text sample may be evidence of his recognition that such an extreme line requires a maximal rhetorical effort.

Quite ironically, this suggests that Dimension 4, "Overt Persuasive Effort," may index, at least indirectly, the form of legitimation chosen by an author in nuclear discourse. It may be the case that authors who choose a reified logic may compensate for or seek to enhance the formality of their logic with a greater dependence upon overt persuasive devices than authors whose

chosen form of legitimation is less formal and is inherently more overtly affective through its greater focus on context-specific, often emotional factors. The defense establishment prides itself on its objectivity and lack of emotion. It is one of the dominant discourse's requirements for dialogue with other discourses; an emotional voice is denied legitimacy in the debate. However, the great persuasive effort made by Kahn in his text suggests that the dominant defense establishment discourse may not be as objective and devoid of bias as it believes itself to be, and that it may not adequately meet one of its own requirements for legitimate participation in the nuclear debate.

Dimension 5: "Abstract Versus Non-Abstract Information"

Biber (in press) interprets Factor 5 as a dimension between "Abstract and Non-Abstract Information." The cooccurring features characterizing this dimension include:

conjuncts: e.g., *however, moreover, therefore*;
 agentless passives;
 past-participial phrases;
 by-passives;
 past-participial WHIZ deletions;
 other adverbial subordinators (not concessive, causative or conditional): e.g., *since, while, as soon as*;

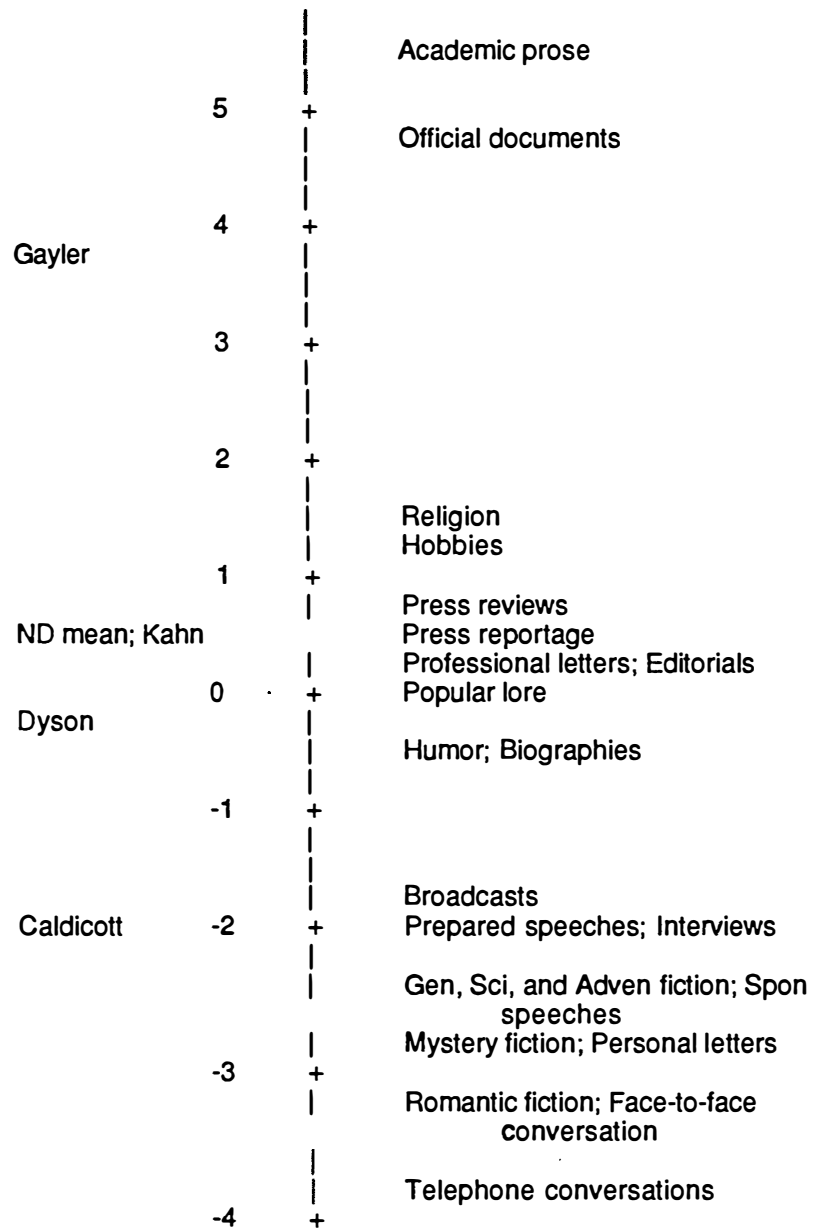
The Factor 5 scores of the four nuclear discourse texts, in descending order from most "abstract" to least "abstract" are:

Gayler:	3.7050
Kahn:	0.4418
Dyson:	-0.1889
Caldicott:	-1.9885
mean:	0.4921

Biber's (in press) factor score scale for Dimension 5, "Abstract versus Non-Abstract Information," is reproduced on the following page, with the nuclear discourse text samples' placement added for comparison with the other genres.

Figure 3: Mean Scores of Dimension 5 for Each of the Genres

(adapted from Biber in press: 203)



As shown in Figure 5, Gayler's text sample was distinguished from the others by the highest degree of "abstractness of information," while Caldicott's is the least abstract. Gayler's sample's placement on Dimension 5 is most comparable to that of "official documents," whereas Caldicott's is closest to "prepared speeches" and "interviews." The difference between the factor scores of these two text samples is great — 5.6935, or approximately 62 percent of the total range of variation among all genres along Dimension 5.

The featural frequencies which mainly distinguish between Gayler's and Caldicott's texts are their respective uses of by-passives, past-participial phrases, and general (multi-purpose) subordination. Excerpts from these two text samples are presented below; features which constitute Factor 5 are underlined (there are no negatively loading features on this factor).

Gayler:

The classic and unsuccessful negotiations to date have attempted agreement on a mix of weapons and weapons systems to be cut back to agreed levels. These negotiations have suffered from three continuing obstacles:

Verification, an obsessive concern of the Americans, has been impeded by an equally overwrought Soviet concern with espionage and sovereign pride.

Equity has been difficult to agree on as between major differences in weapons systems and strategic circumstances. It is further bedeviled by the nuclear wild cards of Britain, France and China.

Arbitrary division of negotiations into strategic, theater and tactical classification has little operational reality but has created major obstacles both to mutually acceptable definition and to horse-trading.

These and similar problems can be comprehensively handled by emphasizing the process of reduction rather than the end goals to be negotiated in advance.

In this passage, it seems that Gayler uses passives to avoid directly attributing blame for the failures of past approaches to nuclear arms negotiation. The topic of the passage, "the classic and unsuccessful negotiations to date," is also the subject of many sentences. This allows Gayler to speak of their failure without attributing that failure to the participants in these negotiations — and this contributes to the passage's sense of abstractness. As Chafe and Danielewicz (to appear) observe, passives often raise abstract concepts to the more salient subject status while lowering the more concrete agent to object status or eliding the agent altogether. By this strategy, verification "has been impeded by an equally overwrought Soviet concern with espionage and sovereign pride"; the Soviets are not directly accused of impeding verification. Equity "is further bedeviled by the nuclear wild cards of Britain, France and China," but these nations are not formally indicted of bedeviling the attempt to achieve equity. Even Gayler's positive suggestions come couched in this abstract form: these problems "can be

comprehensively handled by emphasizing the process of reduction rather than end goals to be negotiated in advance" — but it is not clear (and certainly not forcefully stated) who specifically is to handle the problems and negotiate the parameters of a "process of reduction."

This abstractness provides a clue to Gayler's "mind style" about the negotiation process. As Leech and Short (1981: 189) claim, "one important aspect of mind style is that of participant relations in the clause. It is at this level that semantic matters like agency and responsibility are indicated." Gayler's view of nuclear arms negotiations appears detached from real-world concerns of responsibility and even blame. In an apparent effort to be even-handed in his appraisal of past negotiation failures, his text presents the negotiation process as an abstract alchemy of concepts; if the correct mix of verification and equity are found (and here the agentless passive is used paradoxically), arms reductions will be achieved. Gayler diminishes the active role in nuclear arms talks of real-world entities with real-world interests and fears which are represented by real-world people.

Another indication of Gayler's degree of detachment may be seen below in Table 3, in which the Verb-Adjective ratio of each of the four texts is presented.

Table 3. Verb-Adjective Ratios (VARs)

	<u>Kahn</u>	<u>Caldicott</u>	<u>Dyson</u>	<u>Gayler</u>
VAR	0.94	1.15	0.90	0.70

The VAR, developed by Antosch (1969), is a measure of the degree of emotional involvement of characters in drama. Antosch observed that in various plays "the degree of emotional involvement — highly involved or detached — of a given character in a scene is also reflected in the character's VAR value for that scene....a character's VAR increases in moments of high emotional involvement" (1969: 64). An author speaks through a particular persona even when writing non-fiction, and the relative involvement of that "character" mediating the author's views may be measured by, among other things, its Verb-Adjective Ratio. The low VAR of Gayler's text sample, relative even to that of Kahn's sample, suggests that Gayler does not feel personally involved in the nuclear dilemma, but rather is critiquing it from a distance gained by years of experience. This detachment, as noted above, seems to color his views of the role of the superpowers in arms reduction negotiations.

VAR values in expository prose like nuclear discourse may also provide a measure of the degree of interactiveness with her/his readers which is attempted by the author. Antosch notes that "monologues tend toward low values and dialogues toward high values," and that "literary language tends toward low values, and dialect toward high ones"; further, "scientific works tend to

have low values and folk tales tend to have high values" (1969: 62). In other words, the form and content of a text influence its VAR. One common thread running through Antosch's exemplary dichotomies is the degree to which the author seeks to involve her/his reader in the text, the amount of her/his own perspective which the author assumes is shared by the reader. Gayler, with his historical approach, appears to emphasize teaching his readers what was wrong with past approaches to nuclear arms control. Caldicott, on the other hand, although she also mentions the failure of these approaches, seems to assume more common ground between herself and her readers. This assumption is a driving force of her writing, accounting for the relative non-abstractness of information in her text.

Caldicott:

Because the planet is terminally ill, there is an urgency about our work. Traditional arms-control negotiators have in the past sometimes stopped single weapons systems, but on the whole they have just sanctified and justified continuation of the arms race on both sides, becoming themselves its architects. They and their colleagues in the Pentagon and the corporation have also developed an obscure mystical language for the arms race in order to confuse the public. Because of patient demands, physicians have recently learned to demystify the language of medicine so that patients become adequately informed about their illnesses. Similarly, it is time to demystify the arms race. There are no professional "arms controllers." If there were, we surely would have had real arms reductions by this time.

It is also time to change our way of thinking about arms control. I prefer not to use this phrase at all. Let's talk about rapid bilateral nuclear disarmament. It must be rapid because even if we achieve a freeze we still have 50,000 nuclear weapons; even if we move down to 5,000 within five years, that is still ample to kill most people in the world...

Caldicott, whose text sample had the highest VAR of the four samples, not only presents herself as a highly involved member of the nuclear arms reduction movement, her main purpose in writing is to move others to become actively involved as well. This aim is clearly shown in the title of her second book on the subject: *Nuclear Madness: What You Can Do!* Note that in the long excerpt above (nearly one-ninth of her entire text sample), there are no passives at all. In fact, on the rare occasions when Caldicott does drop her almost passionately active voice, the loss of agent is due to her adoption of an imperative mode: "Cultural exchanges and scientific exchanges must increase, and trade between the superpowers must become the utmost priority." Her view is one of active involvement of diverse individuals united for the common aim of survival, which is impossible without such involvement.

Conclusion

This paper, in presenting the results of a multi-feature/ multi-dimension analysis of four nuclear discourse texts, has introduced an analytical tool of potential value to the study of variation between modes of discourse within a given sub-genre and between a sub-genre and other genres of English. On a theoretical level, the results of this study have suggested ways in which quantitative indices of communicative functions can guide microanalysis to distinguish between aspects of authors' world-views. For example, an attempt to explain the relatively non-nominal style of Herman Kahn's text sample — a quantitative result which was counterintuitive, given the formality and decontextualized nature of the author's argument — led to the recognition of Kahn's polarized view of U.S./Soviet relations and one of the means by which a text may communicate the author's scope of identification to the reader. The uses, in the texts studied, of the pronouns "we/us" and "they/them" also suggest an additional facet of the dimension of author's scope of identification; important aspects of the theoretical "topography" of a text are as much indicated by the entities against which the author places her/himself in opposition as by the group with whom the author identifies her/himself and his reader.

While the factors discussed here do not directly index either of Wertsch's (1987) dimensions of variation in nuclear discourse (a not surprising result, given the different linguistic levels of variation described by the two approaches), several aspects of Wertsch's distinctions — between universal and non-universal scopes of identification and between reified and non-reified — may be indirectly indexed by some of the features which have proved salient here. Finally, this paper demonstrated many of the rhetorical uses of the various linguistic features which were measured in the analysis, contributing to the precision and comprehensiveness of the interpretation of the factors discovered by Biber (in press).

Although the database of this study is small, the results suggest that the sub-genre of written nuclear discourse is most significantly and dramatically distinguishable from other genres by a very high frequency of markers of overt persuasive effort. This is apparently true even of the texts of the defense intellectuals who use more reified forms of legitimation and claim for themselves the more "objective" and "logical" higher ground in the nuclear arms debate. Results like these may enable alternative modes of nuclear discourse which have remained, for the most part, disenfranchised from the decision-making process, to demystify the language of the dominant defense establishment discourse and expose some of the fallacies and counterfactual assumptions upon which it rests.

Notes

1. Of course, "popular" publications like the texts analyzed constitute only a part of nuclear discourse, but the current database was chosen because of the presumed general acceptance that these texts are, in fact, a part of nuclear discourse and the wide availability (and therefore potential influence) of these texts.

2. The position of Kahn's text on this dimension, and perhaps to some degree on other dimensions as well, may be influenced by the fact that *On Thermonuclear War* was originally written as a series of lectures, then edited for publication. This may contribute to its more "involved," conversational style. However, it is in its written form that Kahn's text will make its future influence upon the nuclear debate felt, as it has for the last twenty years, and this justifies its analysis in that form. Also, Kahn's original lectures, although delivered orally, were written, and several stylistic features — for example, its syntactic complexity — indicate that it is very much a written, as opposed to an oral, text.

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