

This article responds to two central questions about value change that are raised by other articles in this volume: (1) Are political cleavages in Western society gradually being transformed from the traditional pattern based on social class and religion, toward one that increasingly reflects the polarization between materialist and postmaterialist goals? (2) Has an intergenerational value shift been taking place in recent decades—or do the observed differences between the priorities of old and young simply reflect an unchanging life cycle pattern? Cohort analysis based on more than 140,000 interviews carried out at numerous time points from 1970 through 1984 demonstrates that a long-term process of intergenerational value change was taking place, based on strong intercohort differences that persisted throughout the tumultuous economic ups and downs of the past 14 years. Additional evidence indicates that this process has had a major impact on political cleavages, changing the political meaning of left and right, and the issues and social groups associated with these terms.

## NEW PERSPECTIVES ON VALUE CHANGE

### Response to Lafferty and Knutsen, Savage, and Böltken and Jagodzinski

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**T**he three foregoing articles examine the hypothesis that the priorities of Western publics have been gradually shifting from materialist toward postmaterialist values. Each of them provides valuable insights about current processes of social and political change. The article by Lafferty and Knutsen, and the article by Savage, however, have an important point in common: both examine the relationship

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between materialist/postmaterialist values and how Western publics polarize along a left-right ideological dimension. Implicit in both articles is the question whether political cleavages in Western society are being transformed from a long-established pattern based on social class and religion, toward cleavages that increasingly reflect a conflict between materialist and postmaterialist priorities. I will discuss these two articles first before turning to the article by Boltken and Jagodzinski, which focuses on a quite different question: whether an intergenerational value shift is taking place at all—or whether the differences between the priorities of old and young that have now been found in 24 different countries simply reflect life cycle differences that fade away as the young grow older.

### RESPONSE TO LAFFERTY AND KNUTSEN, AND SAVAGE

Lafferty and Knutsen (this issue) have carried out one of the most exhaustive empirical investigations ever made of the validity of the materialist/postmaterialist concept. They start with the question, "Precisely what does the materialist/postmaterialist values battery really tap?" Is it a deep-rooted aspect of the respondent's personality, interwoven with his or her basic personal values—or merely a set of currently fashionable political views?

In part, Lafferty and Knutsen have followed a line of investigation pursued earlier by Marsh (1977), who posed these questions and found that what he called "public Postmaterialism" was positively correlated with "personal Postmaterialism" among the British public. But Lafferty and Knutsen have gone well beyond Marsh's work, carrying out a considerably more exhaustive investigation of the relationship between materialist/postmaterialist priorities; and the individual's personal values, character values, and democratic values. They find a pervasive and coherent pattern of linkages: they conclude that the Materialist/Post-

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*codebooks prepared for distribution by the ICPSR Survey Data Archive, through the support of the National Science Foundation, grant number SES-8208333. Table 3 is based on data that were included in Euro-Barometer 17 under the sponsorship of the International Institute for Environment and Society, of the Berlin Science Center; David Handley and Nicholas Watts were the principal investigators.*

materialist value syndrome represents a highly constrained ideological dimension. As the theory implies, it occupies a central position in the worldview of the Norwegian public.

This confirmation of the theory is in a sense all the more significant because it comes from researchers who clearly were not prejudiced in favor of the theory. Lafferty (1975)—like Marsh (1975)—had initially published an article expressing scepticism that postmaterialist responses tapped anything deep-rooted in the individual's character structure. Each of these scholars subsequently carried out investigations designed to test whether this scepticism was well-founded. The fact that they eventually reached conclusions they did not anticipate reflects a degree of scientific objectiveness and intellectual integrity that I find impressive. Their findings gain further support from research carried out in Germany by Schneider (1981), who also finds pervasive linkages between postmaterialism and personality variables.

Quite apart from these findings, however, Lafferty and Knutsen demonstrate another fact that has far-reaching implications: the distinctness of the materialist/postmaterialist dimension, and the traditional social class-based or "Materialist" left-right dimension. This is also a central finding in the article by Savage (this issue). Though postmaterialists tend to place themselves on the left side of a left-right ideological scale, and materialists on the right, it is only a tendency, not a one-to-one relationship: substantial numbers of postmaterialist identify with the right, and many materialists identify with the left.

There is an interesting contrast between the way this fact is interpreted in the two articles: while Lafferty and Knutsen see it as part of a pattern that confirms the theory, Savage sees it as partly contradicting the theory. These diverging interpretations reflect the fact that the left-right concept is more complex than it seems, and its relationship to the materialist/postmaterialist dimension, consequently, is also complex.

Though the left-right ideological dimension might seem to be a unidimensional construct with a more or less self-evident meaning, in fact it means different things to different people; moreover its meaning and social basis can change over time. The concept has been with us since the late eighteenth century and will probably be with us in the twenty-first century—but with quite different connotations from those it carried in the early twentieth century.

According to the classic model of industrial society, political polarization is a direct reflection of social class conflict. The working

class is considered the natural base of support for the left, and the key issue underlying the left-right polarization is conflict over ownership of the means of production and the distribution of income.

With the rise of advanced industrial society, there is a growing tendency for politics to polarize along a new dimension that cuts across the traditional left-right axis. Increasingly, support for social change comes from middle class groups with postmaterialist values. These groups have raised new issues that are only remotely related to traditional social class conflict, but have become an increasingly salient part of the political agenda. The environmentalist movement, the peace movement, the women's movement, the limits to growth movement, and the opposition to nuclear power all are manifestations of a new axis of political polarization that has only a tenuous relationship to the class-based issues of industrial society; and on which the "left" position draws its mass support not from the working class, but from a postmaterialist constituency that tends to be young, prosperous, and well educated.

Although the specific issues and the social base of the left have been changing a great deal during the past generation, the terms "left" and "right" continue to be used; they are too useful to discard. Moreover, at a high level of abstraction, there is continuity of meaning: the "left," both in the past and in the present, refers to a change-oriented issue position—and to those groups that support change, rather than the existing hierarchical order. Finally, the terms continue to be used because they have become firmly attached to given political parties (Inglehart and Klingemann, 1976). If one identifies with the French Communist Party, for example, one views oneself as belonging to the left, regardless of what one's views may be on new issues such as nuclear power or environmental protection.

Thus the theory does not imply that postmaterialists will necessarily identify with the left. Indeed (for reasons implicit in the theory) they tend to come from the economically more secure strata of society: Insofar as traditional patterns of political cleavage continue to prevail, their social class background tends to link them with the *right*. Their personal values, however, work in the opposite direction. They give top priority to values that are fundamentally different from the materialist values that have long prevailed in industrial society. Insofar as their own goals conflict with prevailing societal goals, postmaterialists are a change-oriented constituency. And insofar as the parties of the left are

more likely to adopt postmaterialist goals, they tend to gain the support of the postmaterialist constituency.

The linkage between postmaterialism and the left, then, is not automatic: It depends on what specific parties do, in specific settings. By and large, the parties of the left are more apt to adopt postmaterialist policies because they tend to be relatively open to social change in general; but there are tremendous differences between parties, even within a given political family—as illustrated by the contrast between the rigid authoritarianism of the French Communist Party and the relatively flexible and innovative Italian Communist Party, for example.

Some time ago, Lipset and Rokkan (1967) spoke of the “freezing of party alignments,” arguing that political cleavages in western countries have remained fixed in the pattern that prevailed when the working class became mobilized politically early in this century. Today, this argument is only partly true (Shamir, 1984); but to the extent that it is, materialist/postmaterialist values are irrelevant to how one votes.

But old alignments are eroding. In some countries, new parties have emerged that are directly oriented toward a postmaterialist constituency (for example, the Greens in West Germany or the Radicals in The Netherlands and Italy). Moreover, long-established parties of the left have experienced tremendous internal conflicts between their traditional materialist left and a newer postmaterialist left, advocating fundamentally different policies concerning national security, nuclear power, and the tradeoff between economic growth and environmental protection. In some cases, postmaterialist activists have brought about major policy shifts (Dalton et al. [eds], 1984).

Thus a major finding of the articles by both Lafferty and Knutsen, and by Savage, is the fact that left-right self-placement is only partly shaped by materialist/postmaterialist values, with traditional party loyalties based on religion and social class playing an even more important role. They are clearly correct, and their point is important. Moreover, Lafferty and Knutsen go even farther: they develop a battery that measures one's position on the classic economic issues. They refer to this dimension as the “Materialist Left” or “Materialist Left-Right” dimension; and their terminology is logical, for prior to the emergence of postmaterialism, both left and right were materialist. Lafferty and Knutsen find that the materialist/postmaterialist dimension is only weakly correlated with the materialist left-right dimension: They are

two independent dimensions. But they both help shape one's self-placement on the left-right scale: Its specific issue content reflects whatever issues are most salient in a given era, and today its meaning has been influenced by the rise of postmaterialism, as well as by the classic economic issues.

Lafferty and Knutsen correctly view these findings as confirming, rather than contradicting, the theory of value change: the impact of postmaterialism is supplementary, as Lafferty and Knutsen put it, rather than one of total supplantation, as Savage sometimes seems to imply.

Savage demonstrates that many postmaterialists still place themselves on the right half of the left-right scale; but they do so mainly because they identify with political parties of the right, as his study also makes clear.

One cannot, of course, demonstrate a trend solely from cross-sectional data; but another of Savage's findings at least suggests that there is an intergenerational shift, through which postmaterialists are becoming more likely to identify with the left. For Savage reports that among those born before 1945, postmaterialists are as likely to locate themselves on the left as on the right; whereas among the postwar generation, postmaterialists are twice as likely to place themselves on the left as on the right. This holds true, moreover, despite the fact that the postwar postmaterialists who place themselves on the left have a distinctly higher socioeconomic status than any of his other social categories (Savage, this issue: Tables 5 and 7): Among postmaterialists of the postwar generation, the usual impact of social class seems to have reversed itself.

Another indication of the declining impact of social class is based on longitudinal data: Reliable time series data on social class voting are available from the United States, Great Britain, Sweden and West Germany. They demonstrate that social class voting declined quite markedly from 1948 to 1983, in all four countries (Inglehart, 1983: 442). In the early 1950s, class voting indices in Great Britain and West Germany ranged from about +30 to +45 (meaning that working-class respondents were more apt to vote for the left than was the middle class, by a spread of 30 to 45 percentage points). By 1983, social class voting in these countries had fallen to the range from +10 to +20.

Working-class voters were still significantly more apt to support the left than were middle-class voters—but the spread between the two

TABLE 1  
 Left-Right Self-Placement, According to Social Class and  
 Materialist/Postmaterialist Values<sup>a</sup>

	% Placing Selves on Left	N
1. <u>By Social Class</u>		
Manual head of family	61%	(23,498)
Non-manual head of family	53	(29,459)
2. <u>By Value Priorities</u>		
Materialist	45	(20,891)
Mixed	55	(29,788)
Post-Materialist	75	(6,296)

SOURCE: Polled results of the 1973-1979 European Community surveys. Euro-Barometers 6-12 plus the 1973 EC survey, weighted according to population of each of the nine nations surveyed: France, Belgium, Netherlands, West Germany, Italy, Luxembourg, Denmark, Ireland, and Great Britain.

a. Percentage placing selves on left half (codes 1-5) of left-right scale, 1973-1979.

groups was only about half what it had been a generation before, and what remained was largely due to the persistence of established party loyalties rather than the presence of a more change-oriented ideological predisposition. Consequently, left-right self-placement (because it reflects a mixture of the two components) was even less strongly related to social class, than was voting itself. Table 1 shows the evidence, based on surveys from the ten European Community countries.

Respondents with manual occupations were more likely to place themselves on the left than were respondents with nonmanual occupations—but the difference amounts to only eight percentage points. At the same time, postmaterialists were also a great deal more likely to place themselves on the left; and as they generally have nonmanual occupations, this tends to neutralize the linkage between social class and left-right self-placement.

We argued that what does persist of this linkage, is mainly due to established party loyalties rather than to more change-oriented ideological orientation. Table 2 confirms this interpretation. It shows the

**TABLE 2**  
**Support for Social Change, by Social Class and Materialist/Postmaterialist Values, 1976-1979<sup>a</sup>**

	Respondent favors:				N
	Revolutionary Change	Gradual Reform	Defense of Present Society		
<b>1. By Social Class</b>					
Manual	8%	62%	30%	100%	(17,579)
Non-manual	7	64	29	100	(24,025)
<b>2. By Value Priorities</b>					
Materialist	4	57	38	99	(18,292)
Mixed	8	62	30	100	(26,694)
Post-Materialist	17	69	14	100	(6,098)

a. Based on pooled results from Euro-Barometers 6, 7, 8, 9, 10, 11, and 12 weighted according to population of given nation.

degree to which various social groups in the ten European Community countries support radical change, gradual reform, or the defense of the status quo in their societies. As Table 2 indicates, there is literally no difference between the positions of working class and middle-class respondents at the start of the 1980s. In earlier times—the 1930s or 1940s for example—it is entirely possible that support for reform or even revolutionary change may have been stronger among working-class respondents, whereas the middle class was relatively conservative. Today, social class differences seem to have vanished completely.

But this overall pattern reflects a major change within the middle class (and, perhaps to some extent, a working class reaction as well). That portion of the middle class that has postmaterialist values is strikingly more favorable to social change than the public as a whole: They are four times more likely to favor revolutionary change than are materialists. Among materialists, those who favor defending the present society outnumber revolutionaries by almost ten to one; among postmaterialists, revolutionaries are slightly more numerous.

To what extent does political conflict in Western societies still reflect the traditional class-based social polarization? The answer depends on



which indicator we use: the less closely it is tied to established political party loyalties, the more likely it is to reflect the newer value-based axis of cleavage.

Thus if we use voting behavior as our indicator, party identification plays a major role and traditional social class cleavages are still very much in evidence: despite a marked decline over the past 35 years, working-class voters still tend to support the left, and middle-class voters tend to support the right. In regard to left-right self-placement, the traditional pattern also persists, though more faintly. But in regard to support for contemporary social change, the class-based pattern has vanished almost entirely.

Electoral behavior is important. But it is by no means the only way that publics have a political impact in advanced industrial society. The development of nuclear energy as a source of electric power has been virtually halted in certain Western countries by determined opposition from some segments of the public; disproportionately, this opposition is postmaterialist (Inglehart, 1981).

Another current example of the growing capability for direct intervention in political decision-making on the part of the public can be seen in the opposition to installation of Pershing II missiles and Cruise missiles in Western Europe. Although deployment had been agreed upon by the political elites of the countries concerned, public opposition has made implementation of this decision extremely difficult, has hedged it with various preconditions and, most recently, compelled the Dutch government to delay deployment beyond the time originally agreed upon.

Public opinion survey data indicates that among West European publics, postmaterialists are half again as likely to support the various peace movements as are materialists. But this finding underestimates the extent to which active opposition to nuclear deployment comes from postmaterialists. For, as Table 3 shows, postmaterialists are ten times as likely to be active members of the peace movement as are materialists. Furthermore, working-class respondents are much less likely to be members of the peace movement than are middle-class respondents. This is not a surprising finding: People from middle-class backgrounds are generally more apt to be politically active than are those with manual occupations. But in the present context, it completes the picture in an important way. The working class continues to vote disproportionately for the parties of the left, and tends to view itself as located on the left half of the political spectrum. But support for the new political

**TABLE 3**  
**Membership in Peace Movement, by Social Class and Materialist/Post-materialist Values<sup>a</sup>**

Question: "Can you tell me whether you are a member, or are likely to join, or would certainly not join . . . the anti-war and anti-nuclear weapons movements, such as C.N.D.?"

1. <u>By Social Class</u>	<u>% Members</u>	<u>N</u>
Manual head of family	1.0%	(2,695)
Non-manual head of family	2.3	(3,680)
2. <u>By Value Priorities</u>		
Materialist	.5	(2,618)
Mixed	1.4	(3,855)
Post-Materialist	5.0	(979)

SOURCE: Euro-Barometer 17 survey (April 1982)

a. Percentage saying they "are a member."

movements, and still more, active participation in them, reflects the polarization between materialist and postmaterialist priorities far more than the traditional class-based cleavages.

### RESPONSE TO BÖLTKEN AND JAGODZINSKI

Böltken and Jagodzinski (this issue) attempt two tasks: (1) they seek to demonstrate that I have propounded two versions of the materialist/postmaterialist theory of value change instead of one; and (2) they try to demonstrate that cohort effects are absent in the data on materialist/postmaterialist values: any age-related differences that have been observed are due to some combination of life cycle effects and differences in communications patterns; moreover, they assert, these age differences have been dwindling away.

Although I do not find their argument persuasive, it reflects a great deal of imagination and intelligence. They have provided a very

stimulating contribution to the analysis of value change. Although I will present a quite different interpretation, their cohort analysis in particular is well worth considering.

The first of the two tasks they undertake seems rather pointless, however, because the interpretation that they try to read into my writings is inherently implausible, inconsistent with one of my key hypotheses, and has, from the start, been explicitly rejected in my statement of the theory. Nevertheless, Böttken and Jagodzinski manifest some confusion about the theory, which I will try to clear up briefly.

The second task is considerably more significant. If, as Böttken and Jagodzinski argue, the data showed no cohort effects, our interpretation of the postmaterialist phenomenon would be affected profoundly. The implications concerning intergenerational change would be groundless; we would still have some massive life cycle effects to interpret, but there would be no reason to anticipate political and cultural change as a result of intergenerational population replacement.

I will deal with the empirical analysis of intergenerational value change in some detail, reexamining Böttken and Jagodzinski's analysis and also updating the results from 1980 (when their analysis ends) through 1984, presenting separate analyses for all six nations rather than only for West Germany. I will also provide a substantive explanation of period effects in place of the arbitrary and inadequately-specified regression analysis they have presented.

The evidence seems unequivocal. In all six nations for which data are available from 1970 through 1984, strong cohort effects are present, with the older generation holding markedly and consistently more materialist value priorities than the younger birth cohorts. Böttken and Jagodzinski's interpretation seems completely untenable in the face of the broad array of evidence now available. But before turning to this evidence, let us try to clear up Böttken and Jagodzinski's confusion concerning the theory of materialist/postmaterialist values and its empirical implications.

This thesis is based on two fairly simple and straightforward concepts. During the past decade, dozens of writers have written about it; some have agreed with the thesis and others have disagreed, but few found it excessively complex. Böttken and Jagodzinski, however, purportedly find two contradictory interpretations in my writings. Let us briefly review the basic concepts.

The materialist/postmaterialist thesis is based on two key hypotheses:

- (1) a *scarcity hypothesis*: an individual's priorities reflect his or her socioeconomic environment; one places the greatest subjective value on those things that are in relatively short supply;
- (2) a *socialization hypothesis*: to a large extent, one's basic values reflect the conditions that prevailed during one's preadult years.

The scarcity hypothesis implies short-term changes, or period effects: periods of economic and physical security are conducive to postmaterialist priorities; periods of insecurity are conducive to materialism. The socialization hypothesis implies that long-term cohort effects will *also* be found: the values of a given generation tend to reflect the conditions prevailing during their preadult years. The theory implies nothing about life-cycle effects.

How these two hypotheses fit together seems to have eluded Bøltken and Jagodzinski. In their fourth paragraph, they suggest that they are incompatible: one's value orientations must be either stable or unstable, they argue, so if period effects are found in the priorities of adults, stable cohort differences can *not* be present. Accordingly, they conclude that whenever I refer to "persisting value cleavages" I must have in mind a version of the theory in which *only* cohort effects are present, with no short-term fluctuations, or period effects.

This is an inherently implausible interpretation. It assumes that people become robot-like upon reaching adulthood and from then on show no response to their environment. Instead, they respond solely to an internal program, so that the scarcity hypothesis is inapplicable. Implausible though it is, Bøltken and Jagodzinski not only attribute this interpretation to me, but label it "the core model"—which could be taken to mean that it is the primary model—the one I really believe in my heart of hearts.

But I have discussed the impact of short-term factors in considerable detail, and have, from the start, explicitly repudiated the idea that early socialization is the *only* influence on adult value priorities (Inglehart, 1971, 1977, 1981). Most people would probably take this as an indication that I do not propound what they call "the core model." Instead, Bøltken and Jagodzinski assert that I vacillate between their "core model" and a model that includes both cohort effects (reflecting preadult socialization) and period effects (reflecting current conditions). The latter model is, of course, the one I actually have advanced, and

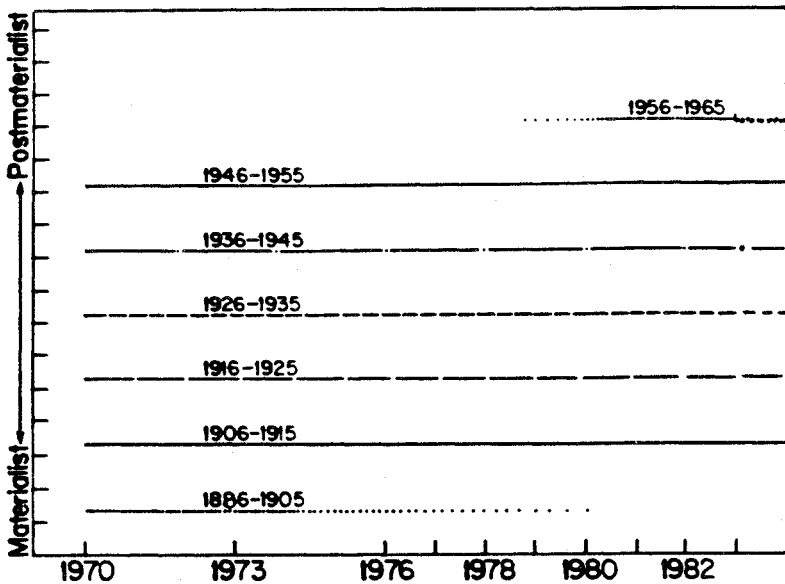


Figure 1a: Cohort Effects Only

Böltken and Jagodzinski's assumption that I alternate between two different models is based on a simple conceptual error: the belief that period effects are incompatible with stable and persisting cohort differences.

They are not at all incompatible, as the literature on cohort analysis has long since made clear. To illustrate this point, let us turn to figures 1a and 1b. Figure 1a depicts the pattern of value differences one would find in Böltken and Jagodzinski's "core model," in which early socialization is the only influence on adult values, so that cohort effects, and only cohort effects, are present.

In this model, the younger birth cohorts are less materialist than all of the older cohorts at all points in time. As no period effects are present, each cohort's values remain absolutely unchanged, regardless of any changes in the socioeconomic environment. But because of population replacement, the values prevailing in a given society do change over time. During the 14-year period depicted here, about 70% of the 1886-1905 birth cohort died off; they were replaced in the adult population by a much more numerous cohort born from 1956 to 1965—a group too

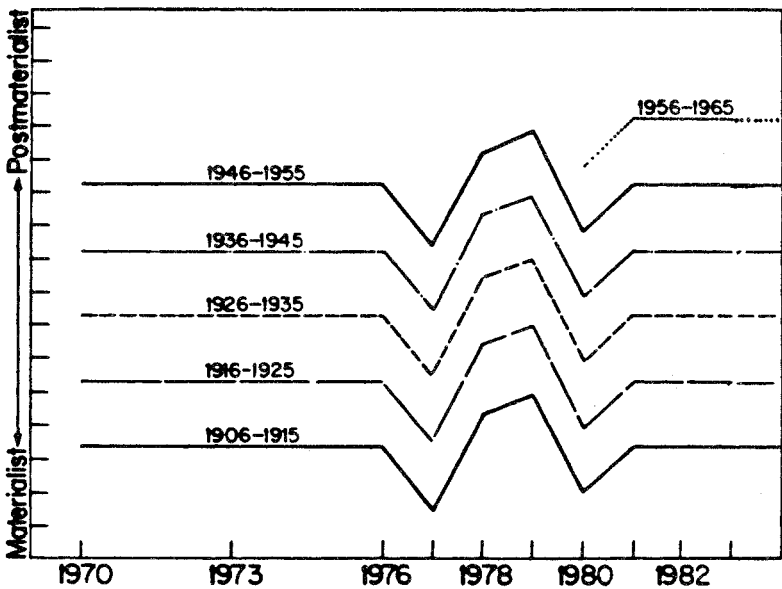


Figure 1b: Cohort Effects Plus Period Effects

young to be included in our samples in 1970, but one that constituted a major part of the adult public by 1984. The fact that this youngest, and much more postmaterialist cohort replaces the oldest, most materialist one, tends to produce a net shift toward postmaterialism.

But the theory I have advanced is based on a scarcity hypothesis as well as a socialization hypothesis. I have consistently argued that whether scarcity or security prevails in the current context will help shape the priorities observed at any given time point: we can expect period effects as well as cohort effects. Figure 1b depicts a pattern of period effects, superimposed on stable cohort differences. Although we observe substantial fluctuations in response to short-term force in this figure, the cohort effects are fully as strong as those in Figure 1a. “Persisting value cleavages” are present in both Figure 1a and Figure 1b. Consequently, in both cases, the process of intergenerational population replacement tends to produce a gradual shift toward postmaterialist values.

In short, period effects are not at all incompatible with stable and persisting cohort effects; this point is far from new in the literature on

cohort analysis, but it is an important concept, and one that seems to have eluded Böttken and Jagodzinski. Indeed, another article by Jagodzinski (forthcoming) is devoted to the thesis that if short-term fluctuations are observed, they prove that stable cohort differences do not exist.

Böttken and Jagodzinski's confusion may be heightened by an uncertainty about the distinction between indicators and the underlying values. The responses to our survey items are, of course, indicators of the respondents' values, not the values themselves. The underlying materialist postmaterialist values dimension shows considerably less fluctuation than the responses to given items, and the broader-based 12-item battery taps this dimension more accurately than the 4-item battery used here (Inglehart, 1983). But even these underlying values would be expected to show at least *some* response to one's environment. Scarcely any orientation is so stable that it is totally influenced by one's situation. Figure 1a, then, depicts a situation that rarely if ever exists except as an ideal type. In setting this up as the "core model" of value change, Böttken and Jagodzinski are erecting a straw man that is extremely easy to refute. To do so does not even require cohort analysis: Any significant fluctuation in the marginals from one year to the next demonstrates that it does not apply. Obviously, the model we have proposed is the one depicted by Figure 1b.

Figure 1c depicts a model in which age-group differences exist but are entirely due to life cycle effects. As a given birth cohort ages, it comes to resemble the next older cohort—so that after ten years have elapsed, a given cohort has shifted to the position held by the cohort that is ten years older. Though each cohort does change over time, the values of the society as a whole do not change, because population replacement is offset by life cycle effects. This is the type of model Böttken and Jagodzinski propose in order to account for the differences in value priorities that have been observed among different age groups in Western societies. Empirically, life cycle effects can be distinguished from cohort effects by the fact that (aside from short-term fluctuations), in the former each cohort manifests a downward long-term trend, whereas in the latter they remain horizontal, when graphed as in Figures 1a-1c. Although my theoretical framework does not exclude the possibility of life cycle effects, it does not predict that we will find them; but it does predict that we will find substantial and durable cohort effects. Our emphasis, then, is mainly on cohort effects.

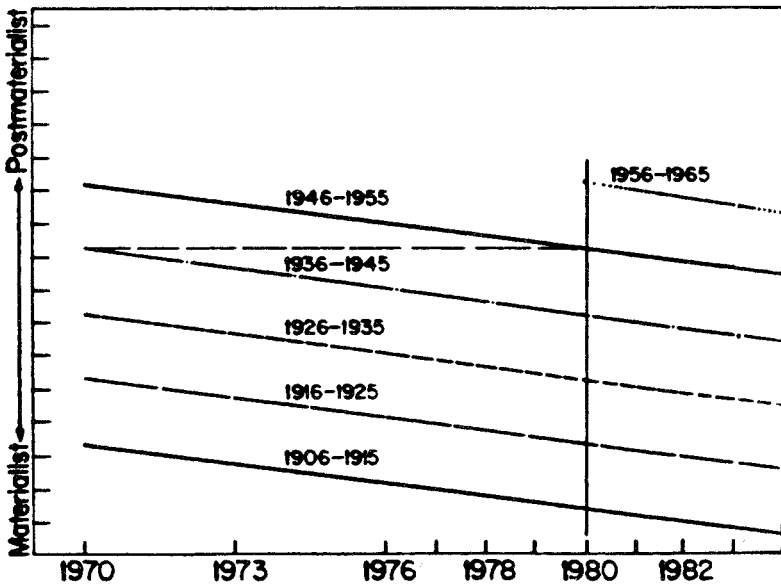


Figure 1c: Life-Cycle Effects Only

Do we find them? A remarkable data base is now available that enables us to answer this question. It is based on surveys that have been carried out in eleven different years from 1970 through 1984, in each of six Western nations. These data enable us to test the materialist/postmaterialist value change model, and the other models, empirically.

Böltken and Jagodzinski suggest that although the “core model” can be tested, our own model has been “immunized” to the point where it is unfalsifiable, or nearly so. This, of course, is far from true. Our theory will be falsified if: (1) no substantial and persisting age-group differences are found; (2) they are found, but have the wrong polarity, with the young being more materialist than the old; (3) they exist, but can be shown to reflect life cycle effects, rather than cohort effects; (4) no significant period effects exist; or (5) they exist, but move in the wrong direction, with rising prosperity leading to increased materialism or vice versa. Böltken and Jagodzinski attempt to demonstrate empirically that both the first and third of these conditions hold true—as well as the fifth, to some extent. Clearly, there are abundant ways in which the theory could be falsified. Let us turn to the empirical evidence, to see how well Böltken and Jagodzinski’s claims are sustained.



## EMPIRICAL ANALYSIS OF VALUE CHANGE, 1970-1984.

Böltken and Jagodzinski try to show that cohort effects are absent by using two different analytic approaches: (1) a NONMET regression analysis, presented in tables 1 and 2 of their article; and (2) a cohort analysis, for which the results are tabulated in tables 3 and 4, and presented graphically in figures 1, 2, 3, and 4.

The graphs furnish the image that most readers will retain from these analyses. There is a good deal of truth in the adage that a picture is worth a thousand words: statistics are easily forgotten, but a graph can convey information in a vivid and memorable form.

Moreover, as we will demonstrate below, the NONMET analysis employed by Böltken and Jagodzinski is inadequate to perform the task they have set for it: their model is inherently underspecified and can only function by introducing arbitrary assumptions that beg the central question. Their seemingly sophisticated statistical procedure "finds" life cycle effects simply because, at the outset, they arbitrarily define the bulk of the age differences as life cycle effects.

Consequently, the cohort analyses are the only part of Böltken and Jagodzinski's analysis that is even partly valid. Precisely because these analyses stay close to the data, rather than transforming them on the basis of arbitrary and untenable assumptions, they convey at least a rough idea of the actual distribution of values among the various age cohorts from 1970 to 1980.

Precisely how reliable a picture of reality is conveyed by these graphs varies a great deal. The analyses based on the combined six-nation sample conveys a rough but relatively accurate picture of reality, whereas the graphs based on the West German data alone are, in some respects, so unreliable as to be misleading.

Why? Because Böltken and Jagodzinski's article provide a textbook illustration of what happens when one ignores some of the basic principles of sampling theory. The authors claim that problems of sample size are automatically solved in their NONMET analysis. This is more or less true, but it clearly does not apply to their cohort analyses. The results they present for West Germany in figures 3 and 4 are heavily distorted by problems of sampling error. Consequently, the pattern becomes erratic; and at the end of their time series, shows little difference between the priorities of old and young. If these results could be taken as a reliable indication of the values prevailing among the German public, they would severely undermine our theory. But—as we

TABLE 4  
Values by Age Cohort, 1973 to 1983

Birth years of age cohort:	Neth		Great Britain		Denmark		Belgium		France		West Germany		Italy		Ireland		Luxem		Northern Ireland		Greece	
	Mat	PM	Mat	PM	Mat	PM	Mat	PM	Mat	PM	Mat	PM	Mat	PM	Mat	PM	Mat	PM	Mat	PM	Mat	PM
1956-1965	22	25	23	14	27	16	29	17	26	21	26	21	33	14	31	11	22	22	31	9	30	17
1946-1955	26	22	28	13	28	17	29	16	29	17	33	15	36	12	37	7	28	12	47	5	38	14
1936-1945	28	19	31	9	34	12	33	11	35	14	38	9	51	7	44	4	35	9	51	4	48	8
1926-1935	33	13	33	8	36	8	36	8	44	9	43	8	56	5	46	5	42	10	53	5	51	6
1916-1925	38	11	35	7	40	5	41	7	47	8	44	7	58	4	49	3	42	5	54	4	53	7
1906-1915	42	8	42	5	48	3	47	5	56	4	48	7	61	2	53	3	47	5	59	3	57	3
1880-1905	44	7	45	3	51	2	52	2	55	3	50	7	61	4	53	3	49	6	56	3	60	5
N =	(20,104)		(21,066)		(19,378)		(19,842)		(21,575)		(20,293)		(21,420)		(19,187)		(5,983)		(5,459)		(6,999)	

will demonstrate—figures 3 and 4 are constructed in a way that provides a very inaccurate picture of actual values, particularly at the later time points when the sample size has fallen to less than half the number of cases that were available prior to 1976.

Böltkén and Jagodzinski (this issue: 474) rely heavily on these German analyses in drawing their overall conclusions:

But then a development that is already present in outline above becomes fully evident: the gap between the generations diminishes in an astonishing way. By the end of 1980, this gap has disappeared almost entirely; in some cases, the relations between the generations are reversed, as can be seen in the overlap of cohort lines.

They conclude, in somewhat ad hoc fashion, that this apparent convergence of generations reflects a combination of mass media influence and life cycle effects:

One explanation might be that for the older people the traditional value orientations remained intact until the early seventies, when the discussion of new issues in the mass media and by the public brought about a process of reorientation. A different process may be taking place in the younger generation. When people get married and join the work force, they may develop more materialistic orientations. . . . However, that may be according to the Eurobarometers, in 1980 the differences between the generations have almost disappeared. . . . Considering the astonishing change during one decade, we cannot see a single reason for persisting in the idea of stable value orientations, and hence of long-lasting gaps between the generations [Böltkén and Jagodzinski, this issue: 478-480].

Do figures 3 and 4 convey a reliable picture of what was happening in West Germany? And is it true, as Böltkén and Jagodzinski suggest, that what was observed in Germany in 1980 (when their time series ends) foreshadowed what was happening elsewhere? The answer to both questions is a definite no. In light of additional evidence, it is clear that the German findings they emphasize so heavily reflect a sampling error anomaly that appeared only in West Germany, appeared only briefly even there—and even for that time, appeared only in those West German samples that Böltkén and Jagodzinski have reported. Other West German samples from 1980 show the usual age relationship, as predicted by our theory. Böltkén and Jagodzinski's finding reflects the fact that they have ignored some basic principles of sampling theory.

Sampling theory postulates that the accuracy with which a given sample reflects how a given attitude is distributed among the public depends in part on sample size: The estimates tend to become less and less accurate as sample size decreases. The EuroBarometer surveys analyzed here are carried out in two waves each year, with 1,000 interviews per country being carried out each Spring and 1,000 interviews each Fall. By combining the two, one can obtain a standard sized national sample that generally runs from 1,500 to 2,000 cases. Or by pooling the cross-national data from any one survey, one can obtain a relatively reliable weighted sample of the European Community as a whole—which is why the results in figures 1 and 2 show a much more coherent pattern than those in figures 3 and 4 of Böltken and Jagodzinski's article.

In their analyses for figures 3 and 4, the authors not only analyze the German sample separately from the others, and analyze the Spring and Fall samples separately, but have broken down each of these samples into five age cohorts, plus a residual category containing all those who don't fit into these age cohorts (a category that becomes proportionately larger over time). As a result, the *Ns* they are using toward the end of the period—in 1979 and 1980—range from 123 to 198 cases per cohort. For present purposes, this is an inadequate sample size. The reasons for this are simple.

If a random probability sample shows that 50% of those interviewed are materialists, then with a sample size of 1,000 there is a 95% probability that the actual figure for the population surveyed falls within the range from 46.8% to 53.2%—a confidence interval of 6.4 percentage points. However we are not dealing with random probability samples, but with quota samples. Here, the margin for sampling error is larger than with random probability samples, but it cannot be calculated precisely. A general rule of thumb is to treat one's effective sample size as half the actual number of interviews when calculating confidence intervals.

Thus, with a random sample of 500, there is a 95% probability that the true percentage of materialists falls within the range from 45.5% to 54.5%—a confidence interval of 9 percentage points. As sample size decreases, the margin one must allow for sampling error increases. With a random sample of 100, we can be 95% certain that the actual percentage of materialists in our sample lies between 39.7% and 60.3%—a range of more than 20 points. This is the approximate range of sampling error one must apply to the German sample when broken

down into cohorts based on nonrandom samples of 123 to 198 cases, as Böltken and Jagodzinski have done in figures 3 and 4.

But the empirical difference in the percentage of materialists, between adjacent age cohorts, averages slightly less than five percentage points. The confidence interval is about four times as large as the difference between adjacent age cohorts—indeed, it approaches the size of the spread between the youngest and oldest cohorts! In other words, the method Böltken and Jagodzinski use virtually guarantees that we will encounter numerous anomalies that deviate from theoretical expectations. Purely as a result of normal sampling error, we can expect to find a number of cases in which younger cohorts appear to be more materialist than older cohorts, even when the true distribution of values accords perfectly with the theory. The authors have raised the ratio of noise to signal to a level where noise frequently swamps the signal.

This problem is compounded by the fact that they also choose to analyze the percentage of materialists and the percentage of postmaterialists separately, instead of using a combined index that reflects them both. In doing so, they throw away the information about the split between postmaterialists and mixed types when analyzing the materialists, and the split between materialists and mixed types when analyzing the postmaterialists. This loss of information produces a diminished accuracy in measuring the priorities of each cohort that raises the ratio of noise to signal still more. The authors rationalize this procedure by asserting that the existence of a materialist/postmaterialist dimension is controversial. In fact, the evidence confirming this dimension is massive (Inglehart, 1977, 1980, 1981, 1982; VanDeth, 1983b; Croon and Stouthard, 1984) and gains further support from evidence presented elsewhere in this volume (Lafferty and Knutsen, this issue).

Finally, let us note that we are dealing with a confidence interval based on a 95% probability. Given a pool of 60 national surveys, each of which is broken down into 5 cohorts, one can expect to encounter about 15 instances (among the 300 subsamples) in which sampling error exceeds the 20-point confidence interval.

Such gross anomalies will be relatively rare. In the long run, they will tend to cancel each other out. The pattern as a *whole* should conform to the theory, if the theory is correct. But it is necessary to base one's interpretation on the pattern as a whole, rather than on a handful of selected observations.

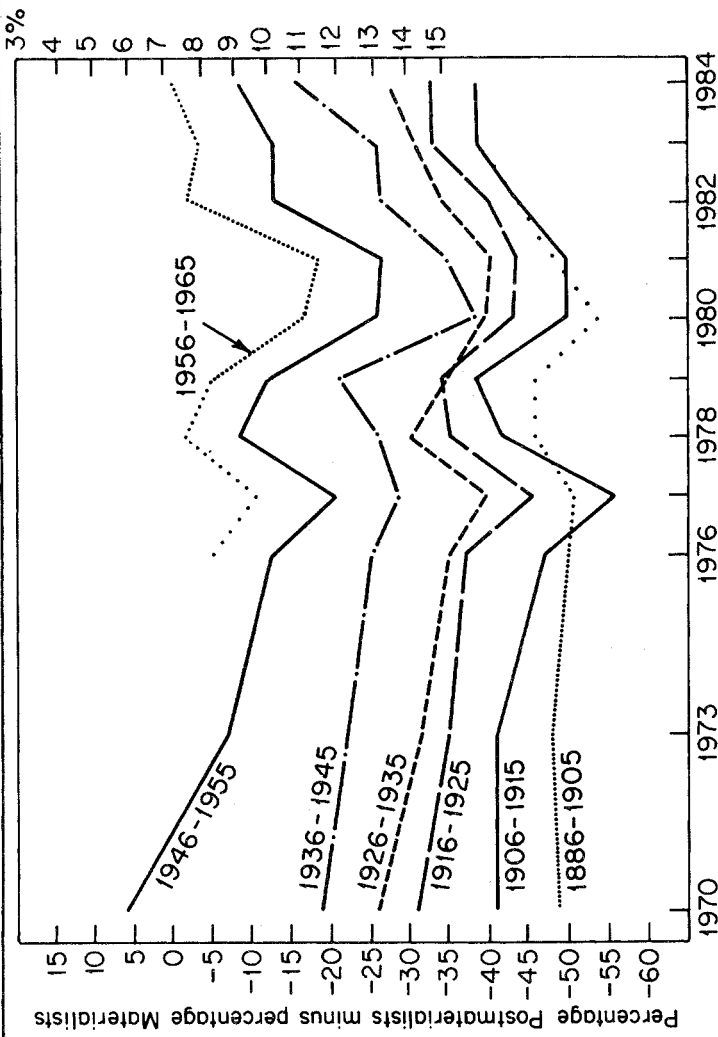
Nevertheless, Böltken and Jagodzinski do exactly that. Finding little difference between old and young in certain West German samples, they

conclude that intergenerational value differences had virtually disappeared in Germany, and were doing so throughout the rest of Europe as well.

How reliable is this conclusion? To answer this question, let us turn now to a cohort analysis of the EuroBarometer data similar to that presented by Böltken and Jagodzinski in figures 1 and 2, except for the following modifications that reduce measurement error: First, when two surveys were carried out in a single year, we combine them to maximize sample size. Second, we use a percentage difference index that reflects the distribution of materialists and of postmaterialists within each cohort, instead of only one or the other. Third, we have weighted each national sample according to the population of the given nation. This improves comparability across time slightly by adjusting for the fact that the relative sizes of the samples from the six respective nations vary somewhat from year to year. Finally, we have analyzed the 1886-1905 cohort separately from the 1906-1915 cohort instead of grouping the two together. We do so because about 70% of the oldest cohort's members died off from 1970 to 1984, making the composition of this oldest group very different in 1984 from what it was in 1970. These procedures provide a relatively reliable picture of the value priorities of the various birth cohorts in Western Europe. Our cohort analysis also differs from that of Böltken and Jagodzinski in one other important way: it follows the respective cohorts from early 1970 to Spring, 1984, instead of stopping in 1980. Figure 2 shows the results.

Though the average difference between two adjacent cohorts is fairly small, the cumulative effect across six or seven cohorts is powerful. Our graph is based on the difference between the percentage of materialists and the percentage of postmaterialists within each cohort. An index of zero, then, means that the two groups are equally numerous; an index of -45 reflects a 45-point spread between the two groups (for example, a situation in which 50% of the sample were materialists and only 5% were postmaterialists, with the remaining 45% being mixed types). Our graph reflects empirical distributions in which, among the oldest cohort, materialists are eight or ten times as numerous as postmaterialists; whereas among the youngest cohort, the two groups are roughly equal.

Perhaps the most striking feature of figure 2 is the persistence of stable differences between the value priorities of the respective cohorts across a period of fully 14 years. In all of the years for which data are available, those born in 1956-1965 constitute the most postmaterialist cohort. At all eleven time points, the 1946-1955 cohort ranks next,



NOTE: Based on representative national samples of the publics of France, Great Britain, West Germany, Italy, The Netherlands, and Belgium interviewed in the 1970 and 1973 European Community surveys plus Euro-Barometers 6 through 21 (total N = 141,133).

Figure 2: Value Priorities of Six West European Publics, by Age Cohort, 1970 to 1984

above all of the older cohorts; at all eleven time points, the 1936-1945 cohort ranks next; at ten of the eleven time points the 1926-1935 cohort ranks next, at ten of the eleven time points the 1916-1925 cohort ranks next; and the 1886-1905 cohort ranks last or second to last in all eleven years. Out of a total of 75 points depicted in Figure 2, we find only four anomalies, and all of these are minor ones. They involve an overlap between two immediately adjacent cohorts and could be caused by samples that deviate by only a few percentage points from the actual values. The pattern is about as close to perfection as one could hope for: The relative positions of the respective cohorts are extremely stable.

There are clear indications of significant period effects as well, and our interpretation will not be complete until we can account for them—a task to which we will turn in a moment. First, let us note a number of additional respects in which the data show a virtually perfect fit with theoretical expectations. As predicted, there are substantial differences between the values of different cohorts and, as predicted, the younger cohorts are consistently less materialist than the older ones. Moreover, as predicted, these differences seem to reflect cohort effects: there is no indication of the long-term downward trend that would be present if we were dealing with life cycle effects. A given cohort does not become more materialist as it ages. The overall tendency from 1970 to 1984 is horizontal: The respective cohorts are generally at least as post-materialist in 1984 as they were in 1970, and if there is any net trend at all, it is upward, toward increasing postmaterialism.

All of this flatly contradicts Bøltken and Jagodzinski's conclusions: the differences between age groups had not disappeared by 1980 (or by 1984). The respective cohorts appear in their theoretically expected positions, and retain them with remarkable stability. Finally, there is no indication whatever of the downward long-term trend that Bøltken and Jagodzinski purport to find: The age-related differences cannot be explained away as life-cycle effects—they definitely seem to reflect cohort effects.

Indeed, the evidence contradicts Bøltken and Jagodzinski's interpretation so flatly, that one wonders how they could have misread the data so completely. Part of the answer lies in the fact that they ended their time series analysis in 1980, at one of two transient low ebbs in the prevalence of postmaterialism. Bøltken and Jagodzinski chose to interpret the net decline in postmaterialism between 1970 and 1980 as a long-term trend, reflecting a life cycle pattern as depicted in Figure 1. With the benefit of hindsight, it now seems clear that the dip in 1980-



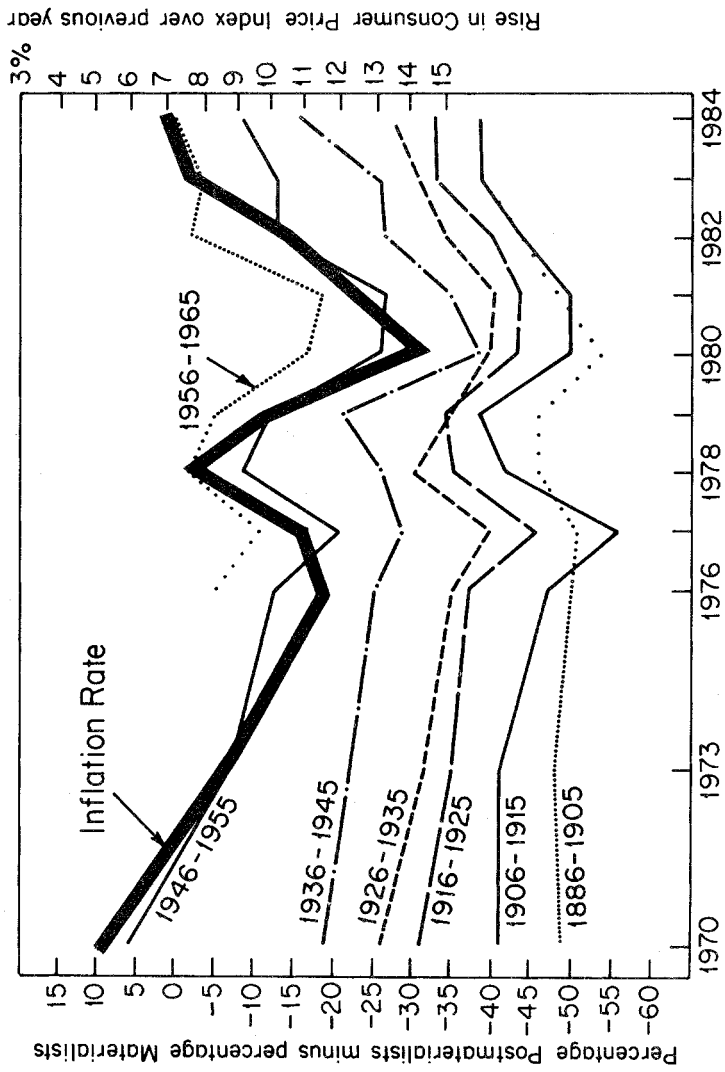
1981 was not a long-term trend, but a short-term period effect; if one ends the time series anywhere except at the two brief low points, a life cycle interpretation is untenable.

We interpret the two dips, in 1977 and 1980-1981, as period effects. But this is a crucial assumption; in fairness to Böltken and Jagodzinski, we cannot lightly dismiss the possibility that the dips observed in 1977 and 1980-1981 do represent a long-term trend, but one that has been concealed by some very powerful upward period effect operating in all of the other years. To be sure, a "long-term" trend that functions in only a few years, and is swamped over 14 years by stronger and more enduring "short-term" forces, is virtually a contradiction in terms. Nevertheless, our interpretation of the cohort analysis will not be secure until we have identified the period effects that are so clearly visible.

It is not difficult to do so. From the start, when we formulated the battery of items first used to measure materialist/postmaterialist value priorities in 1970, we hypothesized that one's sensitivity to inflation would be a good indicator of materialist priorities. Consequently, one of the two materialist options in the four-item battery used here is "fighting rising prices." Our expectation was that different age cohorts, with socializations shaped by different historical experiences, would respond differently to this item, with the older cohorts more apt to give it a high priority.

When we formulated these items in 1969, we did not anticipate the explosive worldwide inflation that would later take place, following the two OPEC oil price shocks of late 1973 and late 1979 respectively. But the logical implications are clear: we would expect such inflation to enhance the chances that a high priority would be given to "fighting rising prices." The theoretically obvious interpretation of the period effects found in Figure 2, then, is that they reflect the two waves of inflation that impinged on Western Europe so dramatically in the mid-1970s and again at the start of the 1980s. Is this interpretation confirmed empirically?

Figure 3 shows the answer: this figure is identical to Figure 2 except that it shows the mean inflation rate for the six nations from 1970 through 1984. The inflation rate is indicated by the rise in the Consumer Price Index during the year of the survey; high inflation rates are reflected in a *downward* movement of the inflation line, so that we have the same polarity for the two sets of variables. In those years for which no survey data are available, the inflation rate is not plotted either.



a. Both Inflation rates and values indices are weighted according to population.

**Figure 3: Value Priorities and Inflation Rates in Six West European Countries, 1970 to 1984<sup>a</sup>**

Again, the fit between data and theory is remarkably good, so good that it is immediately apparent even from simply scanning Figure 3. Each of the two dips toward increased materialism reflects a rise in inflation; and the upward movements of 1978-1979, and of 1982-1983-1984, reflect the abatement of inflation, with roughly a one-year lag. One's impression that the overall pattern reflects period effects superimposed on stable cohort effects, is confirmed by a multiple regression analysis presented below: the inflation rate, plus a constant for each birth cohort, explain 87 percent of the variance in the value priorities of these cohorts. Life cycle effects are not significant.

Clearly, Böltken and Jagodzinski's interpretation does not hold up for the six-nation sample as a whole. But what about the West German findings that they emphasize so strongly? Is West Germany a deviant case, in which intergenerational differences have disappeared for some reason?

Apparently not. Figure 4a shows the EuroBarometer data for West Germany through 1984. As Böltken and Jagodzinski pointed out, age-group differences did narrow around 1980. But this seems to have been a transient anomaly: they returned to their normal magnitude in subsequent years. Indeed, by 1982 they were unusually large: In the long run, sampling error tends to cancel itself out.

The phenomenon observed in Germany was an anomaly. As Figures 4b-10 demonstrate, we find nothing like it in any of the other countries analyzed. Moreover, it was a transient phenomenon even in West Germany. And—most conclusive of all—it was not replicated in other surveys carried out in West Germany in the same years. This same battery of questions was included in three different surveys carried out in West Germany in 1980 (Wave 2 of the Political Action survey, the ALLBUS 1980 survey, and the Wohlfahrt survey), all of which show age-group differences of normal size. Böltken and Jagodzinski acknowledge this fact in a note, but claim it is irrelevant because of minor differences in the format in which the questions were asked (this issue, note 9). In fact, these differences in format are no greater than similar modifications used in EuroBarometers in 1973 and 1978, which Böltken and Jagodzinski accept without hesitation. In both of these years, the four-item battery was asked as part of a broader 12-item battery. Indeed, the materialist/postmaterialist battery seems to be quite robust in the face of changes in format (Van Deth, 1983b; Lafferty and Knutsen, this issue). Böltken and Jagodzinski's interpretation definitely seems to be based on a sampling error anomaly.

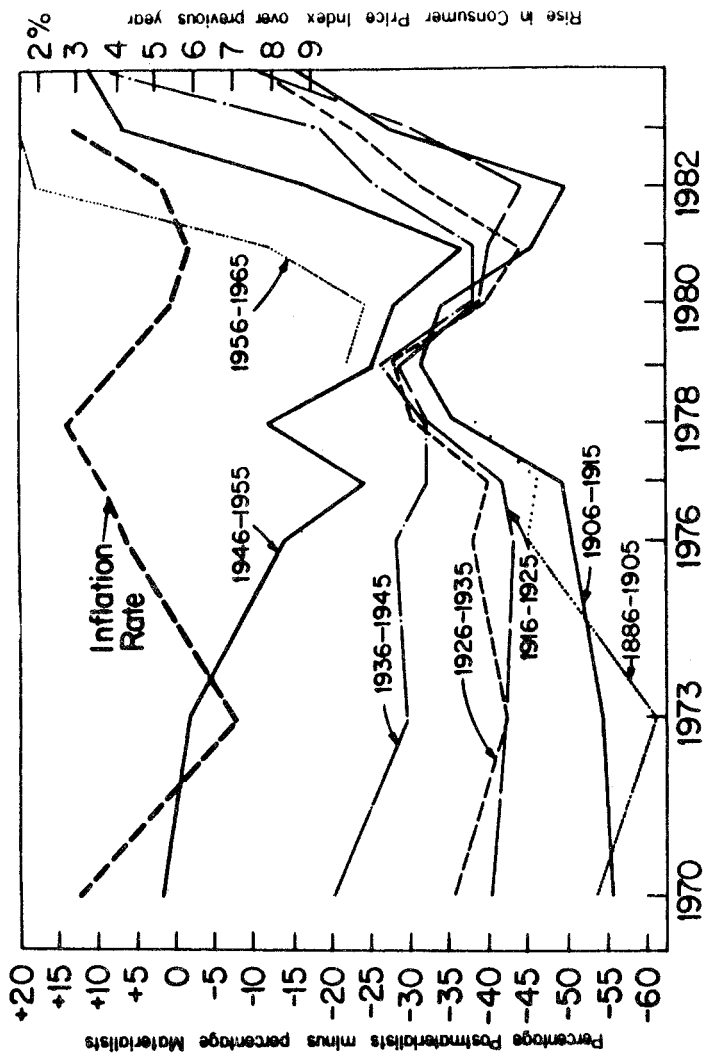


Figure 4a: Value Priorities of West German Public by age Cohort, 1970 to 1984

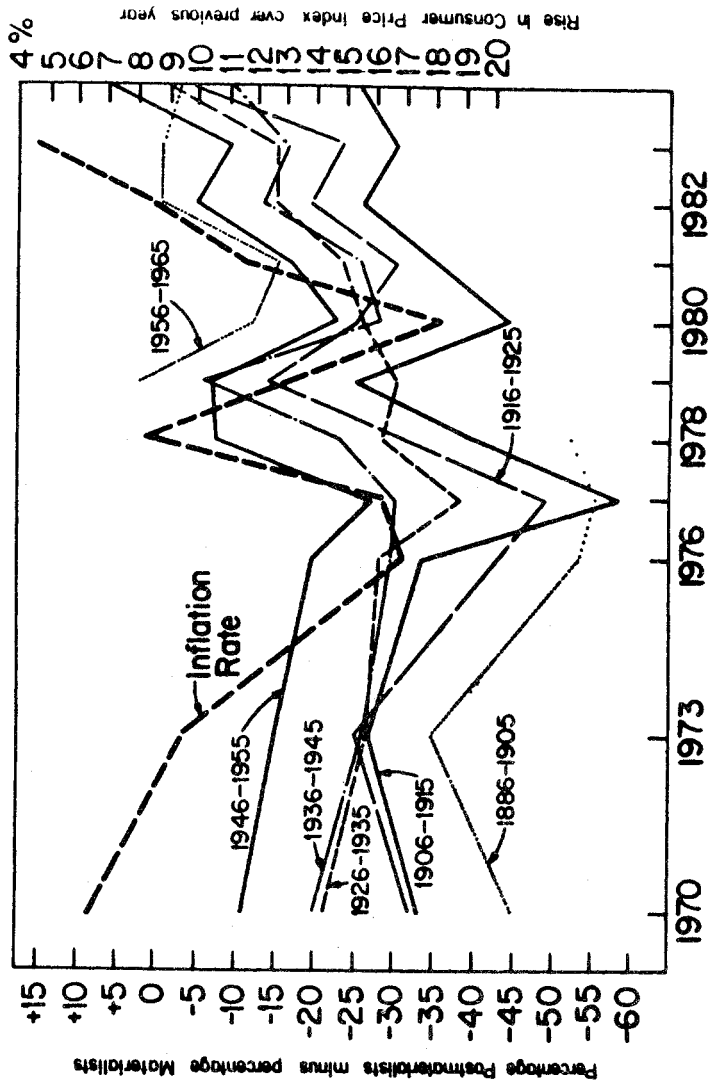


Figure 4b: Value Priorities of British Public by Age Cohort, 1970 to 1984

The West German case is interesting in yet another respect. This country experienced the most moderate rates of inflation among the six during the period from 1970 to 1984. Moreover, by 1984 inflation was back to almost exactly the level that had prevailed in 1970. Thus we have a natural experiment in which inflation rates are controlled not statistically, but in reality. As Figure 4a shows, the German public responded to inflation in the expected fashion: with each peak of inflation there was a dip toward materialism. But by 1983, all of the birth cohorts had regained their 1970 levels of postmaterialism and even risen above them. When period effects are controlled, as is the case here, we find no downward life cycle effects whatever. On the contrary, the data suggest that, holding inflation constant, given cohorts become slightly less materialist as they age. The net result, in the German case, was a very sizable shift toward postmaterialism in the society as a whole. In 1970, we found that among the German public, 43% were pure materialists and 10% were pure postmaterialists (with 47% falling into the four mixed types). In 1983, with inflation almost as low as 1970, the figures were 27% materialist and 19% postmaterialist. At the beginning of this 13-year period, materialists outnumbered postmaterialists in Germany by more than 4 to 1; by 1983, materialists outnumbered postmaterialists by only 1.4 to 1. Abramson and Inglehart (forthcoming) have calculated that, of the 26-point net shift toward postmaterialism in Germany from 1970 to 1983, 19 points were due to population replacement and 7 points were due to intracohort change. In 1984 (with inflation as low as in 1970), the trend continued, with the ratio of materialists to postmaterialists falling below 1.2 to 1. There is some evidence, then, to support Böltken and Jagodzinski's suggestion that there has been a long-term trend among the German public, and if it exists it may well be due (in whole or in part) to the impact of the mass media, as they suggest. But it seems to be moving in precisely the opposite direction from that which they suggest: It is a shift toward postmaterialism.

Britain, in contrast with West Germany, experienced sharp extremes of inflation from 1970 to 1984. The British public responded to these changes, as the close correspondence between the cohort lines and the inflation line in figure 4b indicates. But there is nothing comparable to the contraction of the age-group differences observed in Germany in 1980. The respective British cohorts maintain their distances very steadily, with younger cohorts nearly always more postmaterialist than any of the older cohorts; the pattern is quite consistent, though—because our sample size is only one-sixth as large—there are more

anomalies than in Figure 2, based on the combined six-nation sample.

Like West Germany (only more so), Britain ended this period with an inflation rate that was lower than the rate prevailing in 1970—and like the German public, the British public shows a net upward movement among all birth cohorts from 1970 to 1984. As a result of the combined effects of population replacement and favorable period effects, the British public shifted from a situation in which materialists outweighed postmaterialists by more than 4 to 1 in 1970, to less than 1.5 to 1 in 1984. Of these factors, population replacement seems to make the greatest contribution. The point can be generalized cross-nationally: Where inflation returned to normal, we find no indication whatever of the downward trend upon which Böltken and Jagodzinski's life-cycle interpretation depends. That trend appeared to exist, using 1980 as one's endpoint, simply because in 1980 inflation was almost three times as high as in 1970.

Figure 5a gives the results from a country that does show a downward trend from 1970 to 1984: Italy. The reasons for this trend are evident. Inflation was still running at an annual rate of 11.5 percent in 1984—over twice as high as the rate prevailing in 1970. Italy experienced the most severe inflation among these six countries, and displays pronounced period effects that fit the rise and fall of her inflation rates. And although the proportion of postmaterialists has been rising since inflation reached its peak in 1980, it has not yet regained the 1970 level. Nevertheless, the intercohort differences remain large and stable. With only a few anomalies, the younger cohorts remain significantly less materialist than all of the older ones, despite the severe short-term forces impinging on them.

In short, the public does respond to current socioeconomic conditions, but different birth cohorts manifest very distinctive responses to given conditions. Whether external circumstances are positive or negative, our values battery reflects both cohort effects and period effects quite accurately.

The generational differences in Figure 5a are remarkably stable and free from anomalies. Can we make them disappear? Of course; we need only break the sample down into sufficiently small segments. Figure 5b illustrates this point, with a separate analysis of the data from Sicily and Sardinia. The pattern now is riddled with anomalies, some of them very gross. From the start, the 1906-1915 cohort appears in an anomalous position (ranking well above two younger cohorts) and in subsequent years careens wildly from top to bottom of the graph, ranking anywhere

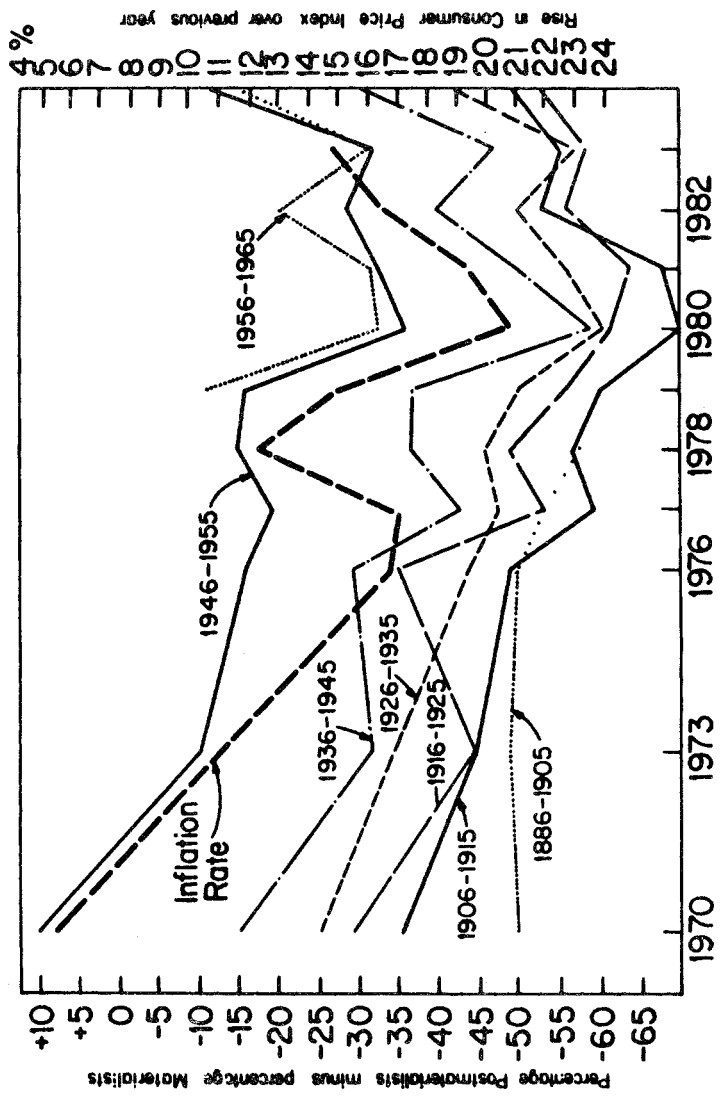


Figure 5a: Value Priorities of Italian Public, by Age Cohort, 1970 to 1984



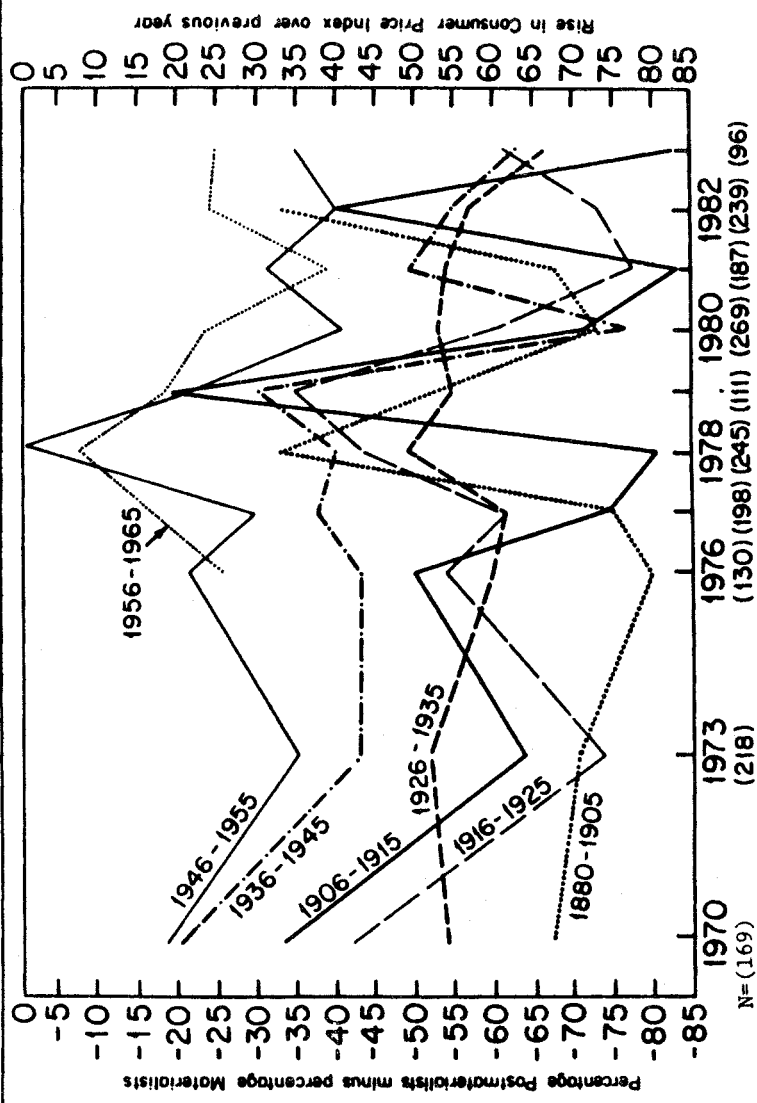


Figure 5b: Value Priorities of Respondents in Sicily and Sardinia, by Age Cohort

from most materialist to second most postmaterialist of the cohorts. The behavior of other cohorts is almost equally eccentric. Have we uncovered some peculiarity of the Italian political culture that makes the Sicilians and Sardinians far more volatile than Italians from other regions? The answer, of course, is no. We have merely illustrated the simple (but too easily forgotten) point that one's estimates of how given attitudes are distributed in the public, become less accurate as sample size decreases. Figure 5b is only a mild *reductio ad absurdum* of Böltken and Jagodzinski's approach. Sicily and Sardinia constitute one of five large regions of Italy; the N's used here are still relatively large. If we carry out similar analyses based on much smaller units—the Saarland, or Limburg, for example—the pattern disappears altogether. We will not present such a graph here. If the reader imagines a plate of tossed spaghetti, he or she has a fair idea of what it looks like.

Figures 6, 7, 8, 9, and 10 present the results from cohort analyses of the remaining three publics that were surveyed from 1970 through 1984, plus two publics (the Danish and the Irish) that have been included in the European Community surveys only since 1973. We will limit ourselves to a few general observations because the basic findings confirm what has already been noted.

In each case, period effects are visible that reflect the inflation rates for the given country. In each case, substantial and enduring cohort differences are also evident, and despite occasional anomalies, the overall pattern is clear: The younger cohorts are less materialist than all of the older ones.

A number of anomalies do exist. We have argued that these can be attributed largely to sampling error: they would tend to disappear in larger, more reliable samples. We have already demonstrated that this occurs in the cohort analysis based on the pooled six-nation data. The pattern in Figure 2 is remarkably close to our theoretical model, displaying considerably fewer anomalies than Figures 4a-10.

Is the regularity and theoretical coherence of Figure 2 just a lucky remarkable fluke that results from pooling cross-national data? No. We obtain results that are equally free from anomalies when we pool the various surveys carried out within a given country. Table 4 shows the intercohort differences in value priorities within each of the ten-member nations of the European Community, based on the combined data from all surveys carried out from 1973 through 1983. Combining these surveys produces 8 large samples of about 20,000 cases, so that each of the 7 cohorts averages nearly 3,000 cases; and 3 smaller samples of

(text continues on page 524)

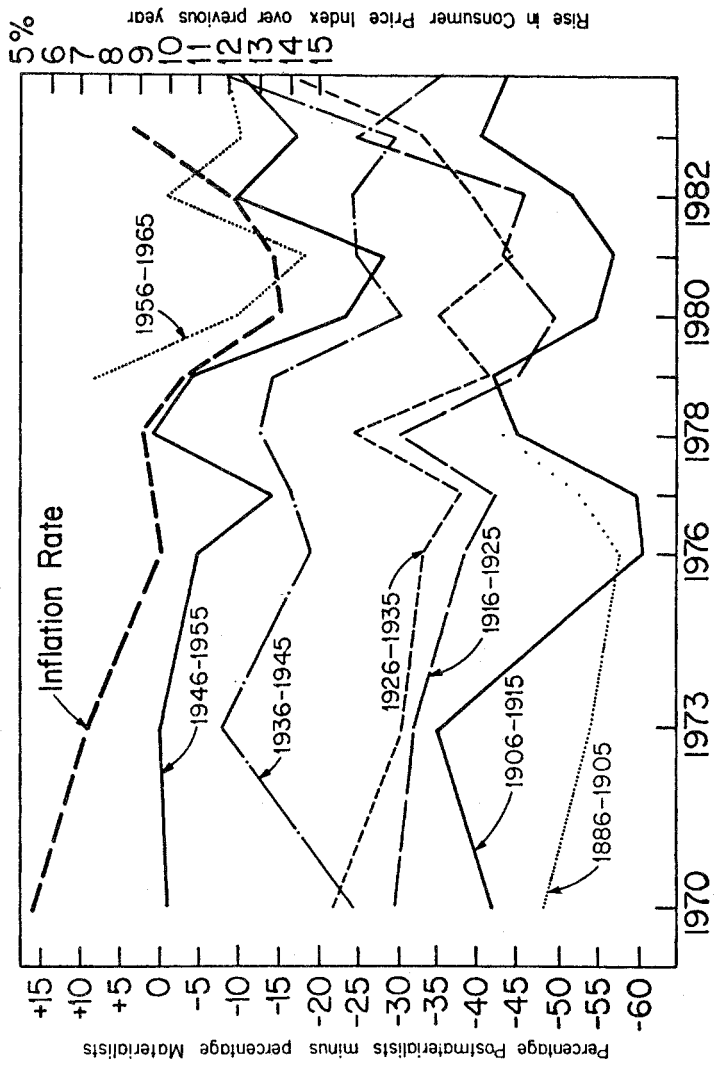


Figure 6: Value Priorities of French Public by Age Cohort, 1970 to 1984

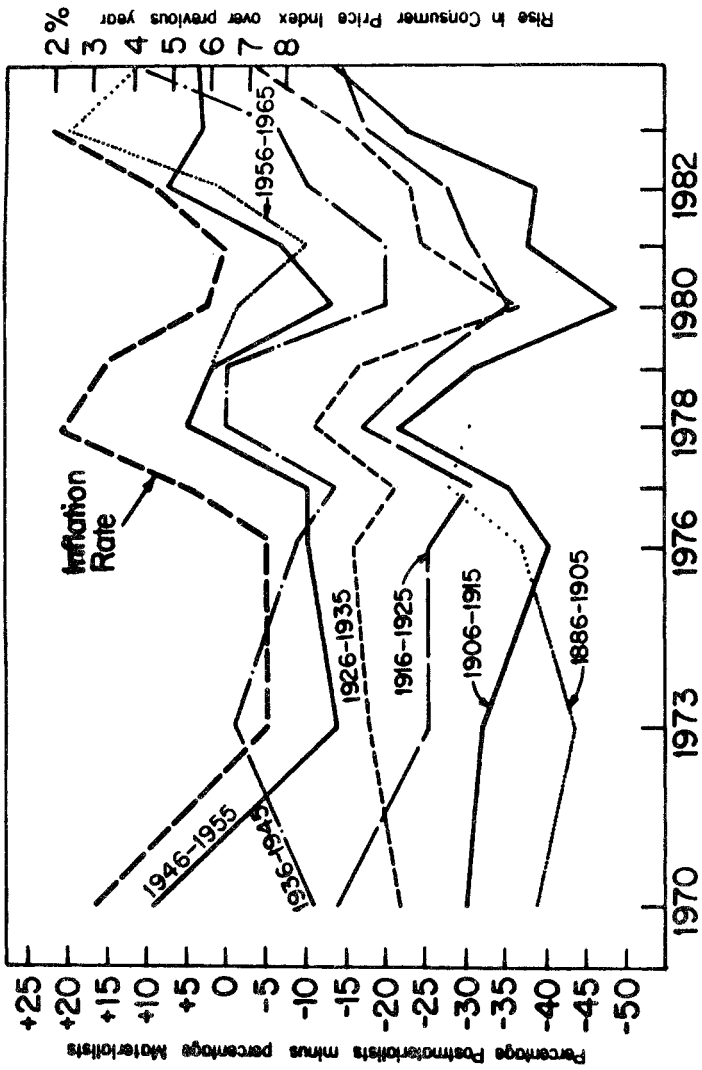


Figure 7: Value Priorities of Dutch Public by Age Cohort, 1970 to 1984

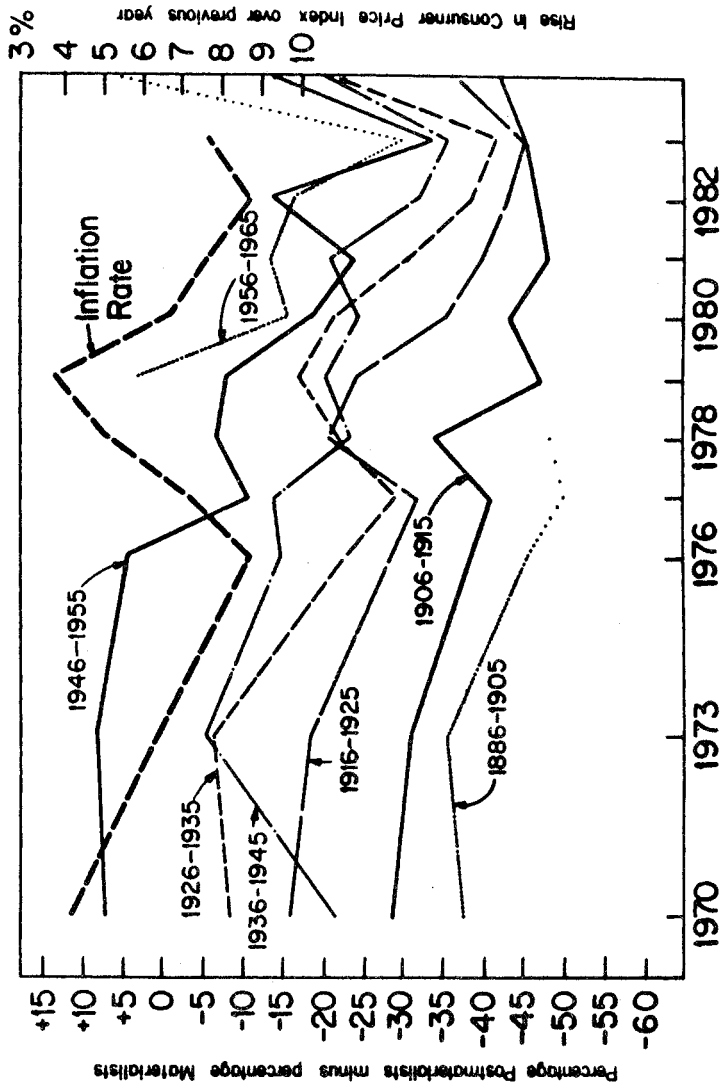


Figure 8: Value Priorities of Belgian Public by Age Cohort, 1970 to 1984

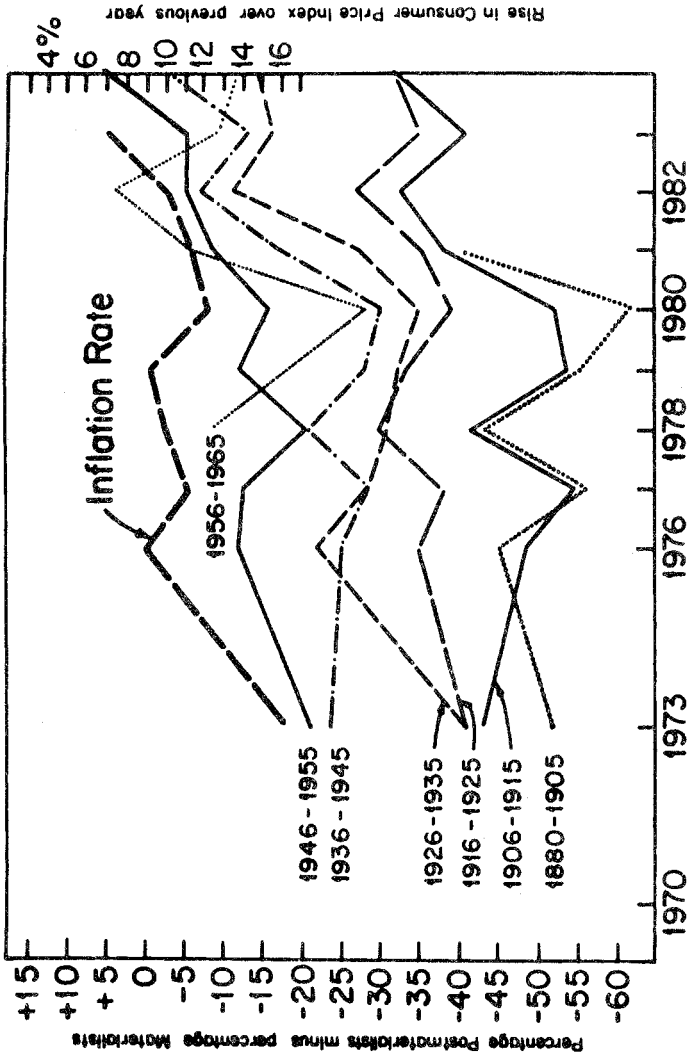


Figure 9: Value Priorities of Danish Public by Age Cohort, 1970 to 1984

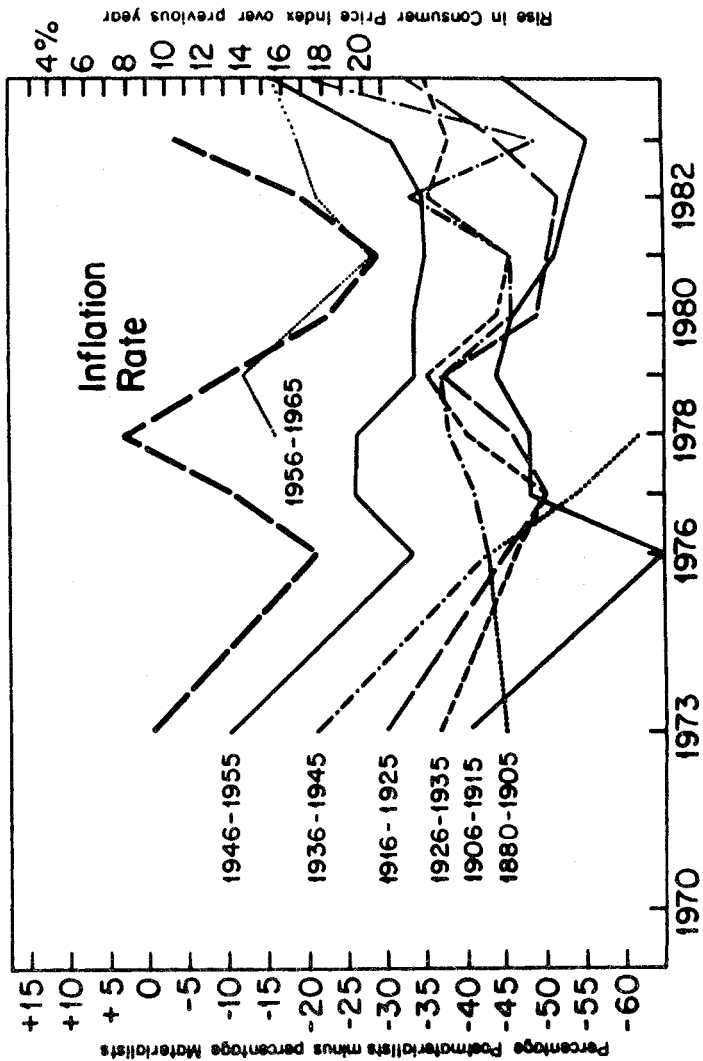


Figure 10: Value Priorities of Irish Public by Age Cohort, 1970 to 1984

between 5,000 and 7,000 cases, having nearly 1,000 cases per cohort. The 3 smaller samples are from Greece, which has only been included in the European Community since 1981; and from Luxembourg and Northern Ireland, in which relatively small samples of about 300 cases are interviewed in each EuroBarometer. Each sample now displays a pattern almost completely free from anomalies: As we move from younger to older cohorts, the percentage of materialists rises regularly and monotonically, whereas the percentage of postmaterialists declines in similar fashion. In the 3 smaller samples, we find 5 anomalies, in which an older cohort is less materialist than a younger one (even by as little as one percentage point) among a total of 42 cells; in the 8 larger samples, we find only 3 anomalies, among a total of 112 cells. Deviations from the theoretical pattern are largely a function of sample size.

As sample size increases, one gets an increasingly accurate picture of reality; and the reality is that younger birth cohorts are less materialist than older ones.

Table 5 shows the inflation rates that prevailed from 1970 to 1984 in each of the six nations surveyed from 1970 on. Table 6 sums up the values shifts from 1970 to 1984, in relation to the inflation each nation experienced. In three nations (The Netherlands, Great Britain, and West Germany), inflation by 1984 had subsided to a level at or below where it was in 1970. In all three of these nations, we find impressive shifts toward postmaterialism. In 1970, materialists were two to four times as numerous as postmaterialists; by 1984, the two groups were close to parity. Part of this shift can be attributed to period effects favorable to postmaterialism, but an even larger portion can be traced to population replacement (Abramson and Inglehart, forthcoming).

In France, we observe a small net shift toward postmaterialism in *spite* of the fact that in 1984 the inflation rate was still substantially higher than in 1970. Here, intergenerational population replacement more than offset rather strong negative period effects.

In Belgium, where the rise in inflation was even more pronounced, we observe a small shift toward materialism; with inflation 61% higher than in 1970, period effects outweighed population replacement, but population replacement held the shift to modest proportions.

Finally, in Italy we observe a substantial net shift toward the materialist pole; Italy was still suffering from double-digit inflation in 1984. The rate was over twice as high as in 1970, and the population replacement effects were swamped by period effects. For the six nations as a whole, however, there was a substantial net shift toward post-



**TABLE 5**  
**Rise in Consumer Price Index Over Previous Year in Six Western Nations, 1970 to 1984**

	Netherlands	Germany	Britain	Belgium	France	Italy	Weighted Mean <sup>a</sup>
1970	4.2%	3.0	6.4	4.1	5.3	5.3	4.9
1973	8.6	7.2	9.4	6.3	7.1	10.8	8.5
1976	9.0	4.3	16.5	9.2	9.6	16.8	11.4
1977	6.4	3.6	15.9	7.1	9.4	17.0	10.9
1978	3.4	2.8	8.3	5.0	9.1	12.2	7.6
1979	4.3	4.1	13.4	3.9	10.7	14.8	9.9
1980	7.0	5.5	18.0	6.7	13.6	22.7	14.0
1981	7.5	5.9	11.9	7.6	13.4	19.5	12.1
1982	6.0	5.3	8.6	8.7	12.0	16.4	10.2
1983	2.8	2.9	4.3	7.7	9.0	14.7	7.4
April, 1984	3.5	3.2	5.2	6.6	7.8	11.5	6.6

SOURCE: Eurostat, Monthly Bulletin of General Statistics Luxembourg: Statistical Office of the European Communities, 1971-1984.

\*Weighted according to population of each country.

materialism despite the fact that inflation in 1984 was still 35% higher than in 1970.

Not only overall, but on a nation by nation basis, there is an extremely close fit between inflation rates and short-term changes in our dependent variable. This is not a surprising finding, but it is important because it furnishes a substantive explanation of the period effects that baffled Bøltken and Jagodzinski—and enables us to sort out the relative importance of period effects, cohort effects, and life-cycle effects in a far more conclusive fashion than was possible in their NONMET regression analysis.

As the literature on cohort analysis has long since made clear, any model that attempts to distinguish between cohort effects, life-cycle effects, and period effects using only the year of the survey, the age of the respondents in that year, and their year of birth, is inherently undetermined (Glenn, 1976; Knoke and Hout, 1976; Markus, 1983): any two of these variables fully determines the third, so we have only two equations with which to determine three unknowns. One must have some theoretical or substantive grounds for eliminating or determining one of the three variables in order to be able to estimate the other two. Boltken and Jagodzinski's NONMET analysis is an attempt to pull

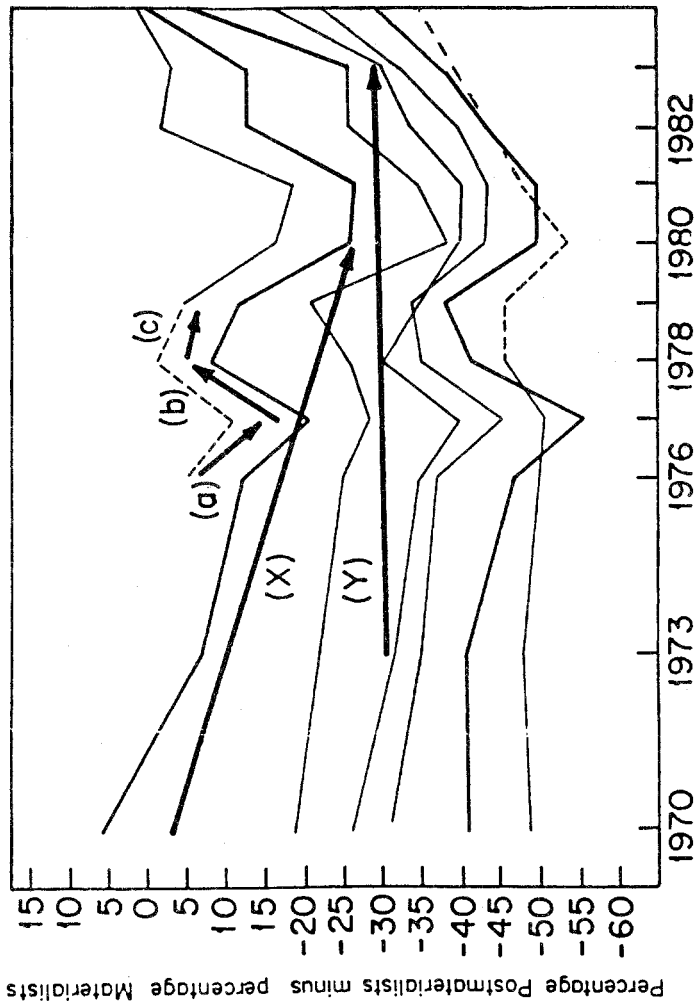
**TABLE 6**  
**Value Priorities and Inflation Rates Among Six Western**  
**Publics, 1970 to 1984**

		% Mats.	% Postmats.	Percentage Difference	Inflation Rates	Inflation Ratio: 1984:1970
Netherlands:	1970	30%	17	-13	4.2%	.83
	1984	21	21	0	3.5	
Britain:	1970	36	8	-26	6.4	.81
	1984	23	16	-7	5.2	
Germany:	1970	43	10	-33	3.0	1.06
	1984	19	17	-2	3.2	
France:	1970	38	11	-27	5.3	1.47
	1984	35	12	-23	7.8	
Belgium:	1970	32	14	-18	4.1	1.61
	1984	34	10	-24	6.6	
Italy:	1970	35	13	-23	5.3	2.17
	1984	43	9	-34	11.5	
Six nations, weighted mean:*	1970	37.2%	10.9	-26.3	4.9	1.35
	1984	29.4%	13.9	-15.5	6.6	

\*Weighted according to population of each nation.

oneself up by one's bootstraps, by introducing arbitrary assumptions about how much of the observed variation reflects short-term period effects, and how much is a long-term trend that presumably reflects life cycle effects.

As Böltken and Jagodzinski have no substantive interpretation for the period effects, their model is both cumbersome and atheoretical. Figure 11 illustrates their procedure. In their German analysis, they arbitrarily assume that period effects are present only in 1977-1979, and specify three brief period effects—one upward and two downward—in these three years. The remaining net shift from 1970 to 1980 is defined as a long term trend—attributable to life-cycle effects. In other words, they have built a large life-cycle effect into their model by a priori assumptions. The model ignores the fact that inflation in 1980 was nearly three times as high as in 1970 (and higher than in any other year for which we have data on value priorities). Instead, most of the difference between 1970 and 1980 is attributed to life-cycle effects. But this "long term trend" in their models is, in fact, a transient phenomenon that manifests itself only if one chooses one of the two low ebbs as one's endpoint. If one uses the decade 1973 to 1983 as one's time span, for



NOTE: Arrows a, b, and c represent the presumed period effects ("short-term effects") and arrow X the presumed 1970-1980 life cycle effect ("long-term trend"). Arrow Y is the corresponding trend from 1973 to 1983.

Figure 11: "Trends" Assumed to Exist in Böttken and Jagodzinski NONMET Analysis

example, one obtains an upward net shift; the same is true when one uses most of the other possible time periods; and it holds true if one analyzes the total time span from 1970 to 1984.

In short, their regression analysis gives unstable results that depend entirely on the endpoints one chooses; it is based on an arbitrary and atheoretical definition of what constitutes a long-term effect, and what constitutes a period effect; and it is cumbersome, specifying three distinct period effects in the German case, and seven different period effects in the six-nation analysis—with each of these period effects reflecting some unexplained cause.

It is possible to construct a much simpler and less arbitrary model. Given the theoretically well-grounded and (as we have seen) empirically highly plausible assumption that the period effects are mainly because of changes in inflation rates, one can explain them on the basis of one clearly interpretable variable. As it turns out, one explains the “long term trend” with this variable as well—for the “long term trend” disappears when we control for inflation, leaving no net downward shift whatever. The young do not become more materialist as they age; if anything, there is a suggestion that the old tend to adopt the values of the young.

Controlling for period effects, the underlying cohort effects remain roughly constant (as Figure 1 implies). Thus we can operationalize the cohort effects very simply by assigning a constant to each cohort, throughout the period analyzed, such that each younger cohort is predicted to be more postmaterialist and less materialist than all of the older cohorts. Life-cycle effects can be operationalized with equal simplicity, coding them as the mean age of the given cohort at the time of the survey. Table 7 shows the results of this extremely simple and straightforward regression analysis, based on the combined six-nation data.

The results indicate that cohort effects and period effects, as operationalized here, explain 87% of the variance in values across time and between cohorts. Life-cycle effects are not significant and explain virtually no additional variance. We have explained most of the observed variance with an extremely simple model. One can explain more of the variance by introducing more complex assumptions about either (1) period effects (it seems unlikely that inflation is the only relevant factor); or (2) about cohort effects, by operationalizing them, for example, with a substantive variable, such as the GNP per capita that prevailed during a given cohort's formative years (see Dalton 1977;

TABLE 7  
 Cohort Effects, Life-Cycle Effects, and Period Effects in the Values  
 Of West European Publics, 1970 to 1982 (multiple regression analysis)

	r	Partial r	Standardized Regression Coefficient (Beta weight)	Level of Significance
Cohort effects (a constant for each cohort)*	.878	.433	.972	.0026
Life cycle effects (cohort's mean age in year of survey)	-.899	.032	.065	.8319
Period effects (inflation rate during year preceding survey)	-.228	-.560	-.323	.0001

NOTE: Multiple  $R = .932$ ;  $R^2 = .869$ .

\*Oldest cohort is coded "1," next oldest "2," and so on, with youngest cohort "6."

Inglehart, 1979). But the present model provides a remarkably good first approximation.

Little remains of Böltken and Jagodzinski's analysis. Their theoretical contribution is based on the mistaken assumption that period effects are incompatible with stable and enduring cohort effects. Their empirical analysis fares no better. The disappearance of intergenerational differences that they claimed was taking place in Europe (and had already occurred in Germany), turns out to be groundless: They had taken an isolated anomaly and projected it into Western Europe as a whole. That anomaly does not appear in other surveys, either in Germany or elsewhere.

Similarly, the long-term downward trend they claimed to find, and on which they based their life-cycle interpretation, has vanished without a trace. In subsequent surveys, the respective age cohorts have been as postmaterialist as ever: across a fourteen-year span, they show no sign whatever of becoming more materialist as they age.

Finally, the period effects they found so puzzling turn out to be readily interpretable; 87% of the variance among the respective age groups from 1970 to 1984 can be traced to two factors: inflation rates and cohort effects. The implications are important.

In the mid 1970s and at the start of the 1980s, the world experienced drastic inflation, producing exceptionally strong period effects. By 1984, inflation rates in most of Western Europe had subsided to their

1970 levels; accordingly, the period effects are now largely controlled for. Given the large intergenerational differences in value priorities that our analysis demonstrates, the effects of intergenerational population replacement should be evident in the value priorities of the public. A great deal of population replacement has taken place since 1970—perhaps more than one realizes. In 1970, those born before 1906 and those born after 1945 were about equally numerous within our sampling universe (which includes all citizens 15 years of age and older): the pre-1906 cohort constituted 17% of the public and the postwar cohort constituted 20%. By 1984, major shifts had occurred: The pre-1906 cohort had fallen to less than 5% of the public, whereas the postwar cohorts now constituted fully 46% of the public. Are these demographic shifts reflected in the distribution of materialists and postmaterialists in Western Europe?

Very much so. In 1970, within the six nations as a whole, materialists outnumbered postmaterialists by a ratio of 3.5 to 1. By 1984, this ratio had fallen to little more than 2 to 1.

Needless to say, we cannot guarantee that inflation rates will remain at their present levels. Extraneous factors (events in the Persian Gulf, for example) could set off a third wave of massive inflation that would have a predictable impact on these indicators. Nevertheless, it seems clear that, period effects being equal, the cohort effects demonstrated here create a powerful long-term tendency for the publics of these societies to shift from materialist to postmaterialist priorities. As evidence presented above, together with the articles by Lafferty and Knutsen, and Savage indicate, this shift has far-reaching implications for the politics of Western societies.

## REFERENCES

- ABRAMSON, P. R. (1974) "Generational change in the American electorate." *Amer. Pol. Sci. Rev.* 68: 93-105.
- and INGLEHART, R. (forthcoming) "Generational replacement and value change in six West European societies." Presented at annual meetings of the Amer. Pol. Sci. Assn., Washington, D.C., September, 1984.
- BARNES, S. H., M. KAASE et al. (1979) *Political Action: Mass Participation in Five Western Democracies*. Beverly Hills, CA: Sage.
- BÖLTKEN, F. and W. JAGODZINSKI (1984) "Post-materialism in the European Community, 1970-1980: insecure value orientations in an environment of insecurity." *Comparative Pol. Studies* 17.

- CROON, M. and P. STOUTHARD (1984) "Some applications of the singular values decomposition technique on 'political action' data." Presented at annual meetings of European Consortium for Political Research, Salzburg, Austria, April 13-19.
- DALTON, R. J. (1981) "The persistence of values and life cycle changes," pp. 189-207 in H. Klingemann et al. (eds.) *Politische Psychologie Sonderheft 12 of Politische Vierteljahresschrift*, 22.
- (1977) "Was there a revolution? A note on generational versus life cycle explanations of value differences." *Comparative Pol. Studies*, 9: 459-474.
- et al. [eds.] (1984) *Electoral Change: Realignment and Dealignment in Western Societies*. Princeton, NJ: Princeton Univ. Press.
- FLANAGAN, S. C. (1982) "Changing values in advanced industrial society." *Comparative Pol. Studies*, 14: 403-444.
- (1980) "Value cleavages, economic cleavages and the Japanese voter." *Amer. J. of Pol. Sci.* 24: 178-206.
- (1980) "Value change and partisan change in Japan: The silent revolution revisited." *Comparative Politics*, 11: 253-78.
- GLENN, D. (1976) "Cohort analysis' futile quest: statistical attempts to separate age, period and cohort effects." *Amer. Soc. Rev.* 41: 900-04.
- INGLEHART, R. (forthcoming) "Aggregate stability and individual-level change in mass belief systems: the level of analysis paradox."
- (1983a) "Changing paradigms in comparative political behavior," in A. Finifter (ed.) *Political Science: The State of the Art* Washington: Amer. Pol. Sci. Assn.
- (1983b) "Stability, change and constraint in mass belief systems: The level of analysis paradox." Presented at the 1983 annual meeting of the Amer. Pol. Sci. Assn., Chicago, September 1-4.
- (1982) "Changing values in Japan and the West." *Comparative Pol. Studies*, 14: 445-479.
- (1981) "Post-materialism in an environment of insecurity." *Amer. Pol. Sci. Rev.*, 75: 880-900.
- (1980) "Zusammenhang zwischen sozioökonomischen bedingungen und individuellen wertprioritäten." *Kölner zeitschrift für soziologie und sozialpsychologie*, 32: 144-153.
- (1979) "Value priorities and socioeconomic change," in S. H. Barnes et al. *Political Action*. Beverly Hills, CA: Sage.
- (1977) *The Silent Revolution: Changing Values and Political Styles among Western Publics*. Princeton, NJ: Princeton Univ. Press.
- (1971) "The Silent Revolution in Europe." *Amer. Pol. Sci. Rev.* 65, 4: 991-1017.
- and H. D. Klingemann (1976) "Party identification, ideological preference and the left-right dimension among western publics" pp. 243-273 in I. Budge et al. (eds.) *Party Identification and Beyond*, New York: Wiley.
- JAGODZINSKI, W. (forthcoming) "Die zu stille revolution: zum aggregatwandel materialistischer und postmaterialistischer wertorientierungen in sechs westeuropäischen Ländern zwischen 1970 und 1981," in D. Oberndorfer et al. (eds.) *Wertwandel, ökonomische Krise und Politik in der Bundesrepublik Deutschland*. Berlin: Duncker and Humblot.
- KNOKE, D. and M. HOUT (1976). "Reply to Glenn." *Amer. Soc. Rev.* 41: 906-08.
- KNUTSEN, O. (1982) *Materialisme og Post-Materialisme I Norge*. Oslo: Institutt for samfunnsforskning.

- LAFFERTY, W. M. (1975) "Basic needs and political values: Some perspectives from Norway's silent revolution." *Acta Sociologica*, 19: 117-136.
- LIPSET, S. M. and S. ROKKAN (1967) "Introduction," in Lipset and Rokkan (eds.) *Party Systems and Voter Alignments*. New York: Macmillan.
- MARKUS, G. B. (1983) "Dynamic modeling of cohort change: The case of political partisanship." *Amer. J. of Pol. Sci.* 27, 4: 715-739.
- MARSH, A. (1977) *Protest and Political Consciousness*. Beverly Hills, CA: Sage.
- (1975) "The silent revolution, value change and the quality of life in Britain." *Amer. Pol. Sci. Rev.*, 69: 1-30.
- ROKEACH, M. (1973) *The Nature of Human Values*. New York: Free Press.
- (1968) *Beliefs, Attitudes and Values*. San Francisco: Jossey-Bass.
- SCHNEIDER, M. (1981) "Postmaterialistische wertorientierung und Persönlichkeit," pp. 153-167 in H. Klingemann et al. (eds.) *Politische Psychologie*, special issue #12 of *Politische Vierteljahresschrift*, 22.
- SHAMIR, M. (1984) "Are western party systems 'frozen'? A comparative dynamic analysis." *Comparative Pol. Studies* 17, 1: 35-80.
- STOCKTON, R. R. and F. W. WAYMAN (1983) *A Time of Turmoil: Values and Voting in the 1970s* East Lansing: Michigan State Univ. Press.
- VAN DETH, J. (1983a) "The persistence of Materialist and Post-Materialist value orientations." *European J. of Pol. Research*, 11: 63-79.
- (1983b) "Ranking the Ratings: The case of materialist and postmaterialist value orientations." *Pol. Methodology*, 9, 4: 407-431.

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