

Capacity, Diversity, and Volatility of the Public Agenda: Trends From 1954 to 1994



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CAPACITY, DIVERSITY, AND VOLATILITY OF THE PUBLIC AGENDA

TRENDS FROM 1954 TO 1994

MAXWELL MCCOMBS
JIAN-HUA ZHU

Abstract This study examined three intertwined hypotheses about long-term trends in the American public's issue agenda: increases in (1) agenda capacity, (2) agenda diversity, and (3) issue volatility. These hypotheses were tested with aggregate time series data covering 40 years of Gallup Poll Most Important Problem questions. The first two hypotheses also were replicated with cross-sectional data at the individual level consisting of 15,000 cases from three different years stretching across 4 decades. While no significant linear increase in the carrying capacity is found, our results provide unambiguously strong evidence for an increase in both agenda diversity and issue volatility. These findings about the public agenda are consistent with the proffered explanation that the volatility of contemporary public opinion is the result of a collision between two opposing forces, the expansive influence of education on awareness of public issues and the constraint imposed by the public agenda's limited capacity.

Early in the history of agenda-setting research, it was noted (Shaw and McCombs 1977) that the public agenda typically included no more than five to seven issues at any one time. For many years, this simply was regarded as an empirical generalization, another instance of Miller's (1956) magic number seven, plus or minus two. Recently this constraint on the size of the public agenda has received closer theoretic-

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cal attention (Zhu 1992), where agenda setting is conceptualized as a zero-sum game in which the rise of an issue on the public agenda is at the expense of other issues. This analysis of three competing public issues, the federal budget deficit, Persian Gulf War, and economic recession, provided empirical evidence that the salience of a particular issue on the public agenda is a function not only of its salience on the media agenda, which is the original agenda-setting hypothesis, but also of the salience of competing issues on both the media and public agendas.

However, this constrictive influence on the public agenda must be juxtaposed with an expansive influence, increased levels of education among the public in recent decades. The impact of education on awareness of public affairs has been succinctly described by Wade and Schramm (1969, p. 209): "From school we emerge with a cognitive map, with an organized life space, and with certain learning skills and habits. More education means more skills and wider interests—in other words, a more complex map. Through the media we chiefly fill in this map." Specifically in terms of issues on the public agenda, Popkin (1991) drew a similar conclusion: "Education affects politics not by 'deepening' but by *broadening* the electorate—by increasing the number of issues that citizens see as politically relevant, and by increasing the number of connections they make between their own lives and national and international events" (p. 36; emphasis in original). Popkin's observation incorporates the widely documented finding that most people, even highly educated persons, rarely possess detailed, in-depth knowledge of the issues of the day. Persons with higher levels of education do read newspapers and discuss the news more frequently. The outcome of these experiences, stated Popkin, is that educated persons "will have limited information about a wider range of subjects, including national and international events, that are further from daily-life experience" (1991, p. 43).

If these hypotheses about the impact of education are correct, the public agenda has been subjected to a tremendous expansive influence in the decades following World War II. From 1950 to 1990 the proportion of the adult population who have at least a high school education has more than doubled, increasing from 34.3 percent to 77.6 percent. During this same 4 decades the proportion of the adult population who have a college degree more than tripled, increasing from 6.2 percent to 21.3 percent.¹

The likely consequence of rising levels of education in the United

1. *The Statistical Abstract of the United States* (Bureau of the Census 1994). For convenience 1950 is compared with 1990. The percentage of high school graduates increased about 2 points in the next 3 years, and the percentage of college graduates only by a fraction of a percentage point.

States in the latter half of this century is a broader array of issues that are able to mobilize a constituency. But these issues contend for a position on a public agenda that is constrained in size, not open-ended. Although it is possible that the public agenda may have expanded somewhat in recent decades to accommodate the press of more issues, it is more likely that the public agenda has accommodated more issues over time by reducing their duration on the agenda. In other words, the explanation offered here is that a collision between the expansive influence of education and the restrictive influence of limited agenda capacity results in a more volatile public agenda. Volatility, defined here in terms of the shifting salience of the issues that the American public regards as the most important problem facing the country at a particular moment, has been noted as a major characteristic of the public agenda. Downs (1972) began his theoretical essay on the issue-attention cycle with this observation: “American public opinion rarely remains sharply focused upon any one domestic issue for very long—even if it involves a continuing problem of crucial importance to society” (p. 38).

Sensitivity to a greater range of issues does not by itself produce volatility on the public agenda. But when a greater number of issues are competing for attention and space on a public agenda that has major constraints on its capacity, volatility is a likely outcome. It is the existence of these constraints on the capacity of the public agenda, coupled with the consequences of education, that provides the explanation for volatility.

Our purpose here is to initiate the examination of the validity of this explanation by testing three specific hypotheses about trends in the carrying capacity, diversity, and volatility of the public agenda from 1954 to 1994.

Hypotheses

Stated in terms of the trend over time, our first hypothesis posits the expansion of the public agenda, one of the effects assumed to result from greater levels of formal education among the public. Examination of this effect is a necessary first step. If it is established that the public agenda has expanded in recent decades, subsequent analysis can determine the extent to which increases in education (the explanation discussed here) and/or changes in other variables (alternative explanations) account for this trend in the public agenda.

Hypothesis 1. The public agenda has increased its carrying capacity over time.

It is important to note that there are two operational versions (mean oriented and variance oriented) to measure the expansion of the public agenda. Hypothesis 1 is the mean-based version, asserting that the total number of issues nominated per person has expanded over time. This formulation corresponds to what several agenda-setting scholars have called "nominal agenda diversity" (Allen and Izcaray 1988; Ferguson 1984). For example, Allen and Izcaray defined nominal diversity as "the number of issues a particular social unit considered salient" (1988, p. 32) and used individuals as the social unit in their study. Their results show that better education and reading newspapers (as opposed to watching television) contribute positively to the number of issues an individual can recognize. Ferguson offers a similar definition, nominal diversity as the number of discrete categories, while noting that this is only one dimension of diversity. Her definition of a second dimension, attributive diversity, is taken up by Hypothesis 2.

Hypothesis 2. The public agenda has become more diverse over time.

Hypothesis 2 represents the variance-oriented operationalization of the expansion of the public agenda. By focusing on the pattern of individual responses, Hypothesis 2 asserts that public attention has become broader, or less preoccupied by one or two dominant issues. This version of an expanded public agenda parallels the "attributive agenda diversity" defined by Allen and Izcaray (1988, p. 32) as "the variety or variance in evaluation about any particular issue or class of issues." Previous studies also have shown that issue diversity is affected by community structure and media environment (Chaffee and Wilson 1977).

Under ideal democracy, the public agenda should display both trends, a continuing expansion of the carrying capacity and an increasing diversity in the public's issue focus. However, as Hilgartner and Bosk (1988) and Zhu (1992) have argued, the public agenda is limited by many constraints, such as time, attention, memory, emotional span, and material resources. As a result, the process of setting the public agenda is necessarily a zero-sum process. Over an extended period of time, the public agenda could accommodate the larger range of concerns resulting from greater education by increasing the degree of churn among the issues that are able to find a place on the agenda. Some issues remain on the public agenda for several years, while other issues muster a constituency for one or two polls and then disappear. Hypothesis 3 represents one consequence of the collision between an expansive force (education) and a limited public agenda: a more volatile and competitive agenda in which issues come and go more rapidly than they did in the past.

Hypothesis 3. The average duration of issues on the public agenda has become shorter over time.

Method

AGGREGATE-LEVEL DATA

Answers in Gallup polls to an open-ended question about the most important problems facing the country (the MIP question) are used here to measure the carrying capacity, diversity, and volatility of the public agenda. Several other polling organizations, such as CBS News/*New York Times* (hereafter CBS/*NYT*), ABC News/*Washington Post*, and Yankelovich, also conduct MIP polls. The Gallup series is chosen because it has the longest history (dating from April 1939), the most frequent coverage, and the relatively most consistent coding system. In addition, the CBS/*NYT* series is included as a cross-validation.

Gallup MIP items were compiled from the Roper Center for Public Opinion Research at the University of Connecticut. Only the items with the exact question wording “What do you think is the most important problem facing this country today?” were considered qualified, which resulted in 158 items covering the period from April 1939 to August 1994.² As Glenn (1974) pointed out, however, Gallup polls used a “quota control” method in sampling up to the early 1950s, which caused an underrepresentation of women, southerners, blacks, and the less educated. Therefore, we dropped the period of 1939–53 from this study.³ The resulting MIP series includes 140 time points covering 486 months from March 1954 to August 1994.

There is another technical issue that has raised concerns: the Gallup Organization switched from personal to telephone interviews in 1987. As Groves and Kahn (1979) reported, telephone interviews tend to generate fewer substantive responses to open-ended questions.⁴ This could confound the test of Hypothesis 1 because it is operationalized

2. Five other items also met our criteria but are not included in the analysis because they appeared during months when an MIP item already had been selected. When two MIP polls were taken in the same month, we always chose the one taken in the earlier part of the month.

3. In an earlier version of this study, we examined the entire period of 1939–94 and found the results to be largely consistent with the findings reported below, which suggests that the findings from this study could be generalized to the earlier years between 1939 and 1953.

4. It should be noted that Groves and Kahn acknowledged that their finding was inconclusive because they compared personal interviews conducted by an experienced team with telephone interviews conducted by a “relatively new” team. In a more comparable case, de Leeuw (1992) found no significant difference in either the number of responses

as the number of substantive responses over time, as described below. However, to preserve the timeliness of this study, we did not drop the period of 1988–94 from the analysis. As a remedy, we compiled a new MIP series based on the CBS/*NYT* polls, to cross-validate the Gallup data. The CBS/*NYT* MIP series, which is the second most frequently conducted, with 48 items covering the period from June 1979 to October 1994, is based totally on telephone interviews.

INDIVIDUAL-LEVEL DATA

While the Gallup poll series enables us to trace the dynamics of the public agenda over 4 decades, we are fully aware of the limitations of such aggregate-level data. For that reason, we have incorporated an extensive sample of the individual-level data of the Gallup polls from which the MIP series was extrapolated. This individual-level analysis focuses on 3 years, one from the 1950s, one from the 1970s, and one from the 1990s. This sampling scheme provides us a manageable data set that covers the post–World War II era reasonably well. In selecting one particular year from each of the chosen decades, we looked for the first year in the 1950s and in the 1990s when there were three or more MIP polls, so that we could pool multiple polls from the same year into a larger data set to ensure enough cases in the subsequent cross-sectional analyses. The years of 1956 and 1990 meet our criterion. The midpoint between the 2 years, 1973, was selected to represent the 1970s. Three surveys each were obtained for the years 1956 and 1990, and four surveys for 1973.⁵ Coincidentally, all 3 years were marked by some major international events, such as the Suez and Hungary crises in 1956, the Arab-Israeli war and the Organization of Petroleum Exporting Countries (OPEC) boycott in 1973, and the Persian Gulf crisis in 1990.

MEASUREMENT

Issue. Issue is a concept central to all three of our hypotheses. But what is an issue? The original categorization of the Gallup MIP series does not provide a satisfactory answer. From the 140 MIP polls throughout the 40-year period, we have identified a total of 179 unique issue categories, excluding “Don’t know,” “No opinion,” “No prob-

to open-ended questions (table 5.2) or the proportion of item nonresponse (table 5.4) between personal and telephone modes.

5. The dates for these surveys are September 9–14, 20–25, and October 10–18, 1956; January 12–15, February 16–19, May 4–7, and September 7–10, 1973; April 5–8, July 19–22, and October 11–14, 1990.

lem,” and “Refusal.” Two problems arise here. First, some of the categories have not been consistently coded. For example, Unemployment and Recession were sometimes treated as two separate categories but at other times combined into one category (Unemployment/Recession). If we treated each of the original categories as a unique issue, then the inconsistency in coding may confound our findings.

Another problem with the Gallup MIP categorization is that, while some of the 179 categories were repeatedly used throughout the years, many others appeared in only a specific subperiod. In the international arena, for instance, Fear of War and Relations with Soviet/Russia were quite enduring, but World War II, Vietnam War, and Gulf Conflict were only mentioned during limited periods of time. The discontinuity of short-lived categories would cause problems, for example, in defining what constitutes an issue cycle when testing Hypothesis 3.

Although these problems exist, they do not necessarily imply that the Gallup MIP series is useless. To the contrary, as Smith and others have noted, this is a unique series because “no other single item gives us as deep an understanding of American history over the last five decades. The most important problem question provides a grand overview of social change, describes history from the perspective of the participants, and helps to define distinct historical periods and identify turning points” (Smith 1985, p. 264). Smith also conducted an analysis of the impact of changes in the Gallup MIP, such as “(1) variations in question wording, (2) number of responses allowed, (3) coding categories, (4) context and placement, and (5) changes in sample design,” on the frequencies of issue nomination and concluded that “none of these factors was found to have an important effect” (Smith 1980, p. 165).

We share Smith’s assessment of the value and quality of the Gallup MIP series and decided to use the series to test our hypotheses. However, we do need to modify the issue categorization to meet the unique requirements imposed by our hypotheses. Our solution is to combine the 179 categories into 18 broad categories (the coding scheme is listed in app. A). Since there is neither previous research nor empirical technique to determine which issues should be merged together, our grouping is necessarily a priori, based on our views that these represent the most enduring categories of issues that confronted the American public throughout the last 4 decades. In his trend analysis of MIP from 1946 to 1976, which is perhaps the only study comparable to ours, Smith (1980) also regrouped Gallup’s categories on an a priori basis. Our regrouping (with 18 categories) preserves Gallup’s original flavor more than does his (with four categories), however.

Issue-carrying capacity. As discussed earlier, we measure the carrying capacity of the public agenda by the average number of issues

per poll respondent, obtained by dividing the sum of the percentages for all issues mentioned in a survey by 100 percent (the whole sample),

$$\text{MNI} = \frac{\sum_{i=1}^k P_i}{100\%}, \quad (1)$$

where MNI stands for mean number of issues, and P_i is the percentage naming the i th issue (i ranges from 1 to k) as the most important problem. Note that the denominator (100 percent) includes those who answer "Don't know," "No opinion," "No problem," and "Refusal," while the numerator excludes them.⁶

Issue diversity. Diversification of the public agenda can come from two sources: the presence of more issues on the agenda and a more equitable relationship among the size of the constituencies for various issues. Used by several previous agenda-setting studies (e.g., Chaffee and Wilson 1977; Culbertson 1992), entropy (commonly known as the *H*-statistic, which is based on Shannon and Weaver's [1949] information theory) is a summary measure of both aspects of agenda diversity. The *H*-statistic is defined by

$$H = - \sum_{i=1}^k P_i (\log_2 P_i), \quad (2)$$

where P_i is the percentage naming the i th issue (i ranges from 1 to k) as the most important problem, and \log_2 is the logarithm with 2 as the base.⁷ From equation (2), we can tell that the value of the *H*-statistic is determined by two factors: (1) the number of issue categories (i.e., k), and (2) the distribution of issues (i.e., the similarity among P_i 's). The more issue categories that there are, the larger the *H*-value is; and the more evenly distributed the P_i 's, the larger the *H*-value is. Since more issues and more evenly distributed opinions both indicate greater diversity, a larger *H*-value becomes an indication of agenda diversity. However, as discussed above, because of the inconsistency in Gallup's

6. We also calculated the mean number of issues using (100 percent – DK percent) as the denominator. Since the percentage of DK is generally small (the average is 4 percent), the two computational methods result in similar outcomes. For example, the mean number of issues over time is 1.07, based on the denominator of 100 percent (eq. [1]) and 1.11, based on the denominator of 100 percent – DK percent. The regression model (eq. [4]) was applied to both series, yielding comparable results. Thus, we report only the results based on eq. (1).

7. For ease of computation, we used e (= 2.718) as the log base. The resulting *H*-value is slightly different than that from eq. (2). Since we are comparing the *H*-statistic over time, the substantive interpretation remains the same, regardless of whether 2 or 2.718 is used as the log base.

MIP categorization, we have recoded the original 179 issue categories into 18 broad groups and hence k becomes a constant ($= 18$). Consequently, the H -statistic reported below primarily measures the equality of the distribution across the 18 issue categories.

Theoretically, the H -value in this study can vary from 0 to 2.89, with 0 indicating that one issue completely dominates the public agenda (i.e., is nominated by everyone in the poll) and 2.89 indicating that all 18 issue categories receive an exactly equal share of the sample (a rectangular distribution). To make the H -statistic more readily interpretable, we have normalized the H -statistic by dividing it by 2.89 (its maximum value) so that the standardized H ranges from 0 to 1.

In short, our measure of issue diversity is a statistic of dispersion (entropy). Theoretical considerations, as discussed above, dictate us to prefer this H -statistic to other, more familiar statistics of dispersion (e.g., variance or standard deviation). As a validation check, however, we have calculated the H -statistic, standard deviation, variance, and coefficient of variance (i.e., the ratio between the standard deviation and the mean) for the MIP time series, and we found a high correlation between the H -statistic and the other three dispersion measures (.88, .86, and .96, respectively).

Issue volatility. To test Hypothesis 3 (that the issue cycles on the public agenda have become shorter), we need to define the boundaries for when an issue is “on the agenda.” We used 10 percent as the cutoff point to determine whether an issue is on or off the national agenda. If an issue is mentioned by 10 percent or more of the respondents in an MIP poll, we considered it to be “on the agenda.” The cutoff point of 10 percent is based on Neuman (1990), who found that 5–15 percent is the threshold for an issue to capture national attention. Our main interest, however, is not whether an issue is on or off the agenda, but how long the issue will stay once it gets there. For that purpose, we calculated the length (in months) between the time when an issue rises above 10 percent and when it drops below 10 percent. This length of duration becomes the dependent variable for the test of Hypothesis 3.

Strictly speaking, we used the probability of the length of issue duration, rather than the length per se, as the dependent variable in Hypothesis 3 for two reasons. First, the duration of an issue on the public agenda is a nonlinear function of time. Once an issue rises on the agenda, it has the potential to be pushed out at any time. However, the potential grows in a nonlinear fashion as time progresses (Watt, Mazza, and Snyder 1993; Zhu et al. 1993). Therefore, we have used the Kaplan-Meier (KM; see Norusis/SPSS, Inc., 1992) procedure to transform the length of issue duration into a survival function $[S(t)]$,

which represents the probability an issue stays on the agenda at a particular point in time:

$$S(t) = \prod_{t_i < t} \left(1 - \frac{n_i}{N_i}\right), \quad (3)$$

where n_i is the number of issues that drop out of the agenda at time t_i , and N_i is the number of all issues on the agenda at t_i .

Another reason for transforming the length of duration into survival rate is due to the presence of “censored” cases. If we observe the full process of an issue’s rise and fall, then we have a complete record. However, if at our last observation point, an issue is still high on the agenda, we have to use that observation point to calculate the length of that issue’s duration. This situation becomes a censored case. Since a censored case underestimates the duration, the KM survival function adjusts the impact of the censorings.

ANALYSIS

For the aggregate time series data, we have carried out a polynomial ordinary least squares (OLS) regression for each of the three hypotheses. For example, Hypothesis 1 is tested on the basis of

$$\text{MNI} = a + b_1 \text{Time} + b_2 \text{Time}^2, \quad (4)$$

where MNI is defined in equation (1), and Time is the month in which the survey was conducted, with the first point (i.e., March 1954) scored 1, and the last point (August 1994) scored 486. The quadratic term (Time^2) is included to test a nonlinear trend. Of the three coefficients in equation (4), a is the intercept of the resulting regression line, and b_1 and b_2 describe whether there is a linear and a quadratic trend in MNI, respectively. Since Time and Time^2 are necessarily highly correlated, we have centered Time (i.e., subtracted from its mean) to avoid multicollinearity in the regression (Cronbach 1987). The cubic or higher-order terms of Time are not added to the regression because their coefficients are not easily interpretable. The tests of Hypotheses 2 and 3 follow the same procedure, with H and $S(t)$ substituting, respectively, for MNI in equation (4).

Note that our regression analysis is the standard detrend of a time series. However, unlike other time series analyses in which the detrend is carried out merely as a technical necessity to achieve stationarity, the detrend bears important theoretical significance in our study, as explicated in our hypotheses. It should also be pointed out that while OLS regression is well known for its inability to control for autocorrelation in a time series, autocorrelation is not a concern here because

we are interested only in the impact of the trend, which is not affected by the presence of autocorrelation.

For the individual-level data, we first calculated MNI and H for each educational group by year. The individual-level test of Hypothesis 1 is carried out by a two-way ANOVA in which MNI is the dependent variable and education and year are the two independent variables. Hypothesis 2 cannot be tested by ANOVA or any similar procedure, because the dependent variable (the H -statistic) is a measure of dispersion (i.e., one score for each educational group) and the number of cases in table 3 is the number of groups involved, not the number of individual respondents based on whom the H -statistic is derived. Thus, to test Hypothesis 2 at the individual level, we have fitted a series of three-way log-linear models. All of these models contain the same three categorical variables (issue, education, and year), with issue being treated as the dependent variable, and education and year as the independent variables. The models differ in the specification of the presence or absence of the variables education and year, or the interaction between the two with respect to issue.

Hypothesis 3 cannot be tested by the individual-level data because only three discrete years of data are used. Strictly speaking, a test of Hypothesis 3 at the individual level requires panel data collected over a long time span (e.g., a decade) at frequent points in time (e.g., monthly). We are not aware of the existence of such data, nor are we able to collect our own data that meet the requirement.

As mentioned above, our coding of issue (in Hypothesis 2) and agenda (in Hypothesis 3) involves judgmental calls. To assess the impact of such subjective decisions, we have performed a series of sensitivity analyses by altering the coding scheme somewhat and reapplying the same regressions to the modified data. If the results do not differ drastically from the original, then we can establish some evidence of the robustness of the coding scheme.

Findings

HYPOTHESIS 1: ISSUE-CARRYING CAPACITY

Figure 1 shows that there was a slight rise in the carrying capacity from the beginning of the series to the late 1970s, followed by a slow decline throughout the 1980s. The solid line in figure 1 traces the number of issues per person named in each of the Gallup MIP polls. This is the dependent variable of our Hypothesis 1, which posits that the public has increased its issue-carrying capacity, at least in part as a result of the rise in the educational level of the population. Overall,

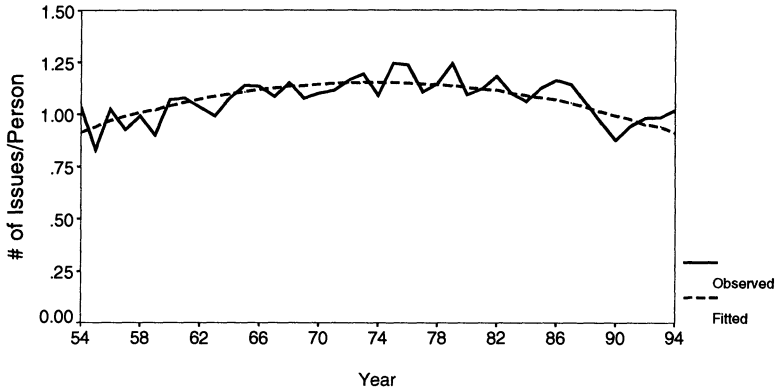


Figure 1. Issue-carrying capacity over time

the number of issues nominated in response to the MIP by the average American has varied in a narrow range between .82 and 1.34, with the mean being 1.07.⁸

The OLS regression analysis confirms the visual impression. As shown in column 1 of table 1, there is no significant linear trend in the issue-carrying capacity ($\beta = .04, p < .60$). However, the quadratic term of Time is highly significant ($\beta = -.66, p < .000$). The dashed line in figure 1 represents this parabolic trend. Note that the quadratic effect coefficient is negative, which suggests an inverse U curve with a maximum (estimated around February 1973).

The relative stability in the number of issues that each member of the public nominates is fully consistent with the zero-sum perspective of agenda setting (Zhu 1992). Of course, one may argue that the way Gallup MIP polls are conducted explains the small number of issues per person found here. It is true that a question about what is the most important problem facing the country implies to the respondent that only one issue is most important. Gallup polls also do not prompt the respondent for multiple answers but do accept multiple answers volunteered by the respondent. It is possible that some respondents named only one issue because they did not know that multiple responses were acceptable. It is also possible that other respondents believed that the issue they mentioned was the single most important problem.

CBS/NYT data. As mentioned earlier, the change from personal to

8. Four items with "outlier" values (2.16 in March 1977, 1.58 in November 1991, 1.58 in March 1992, and 1.80 in September 1992) are excluded because they depart from the mean of the series 4 standard deviations or more (mean = 1.07, SD = .10). The reason why these values are so deviant is unknown, but their presence in the series would yield misleading results.

Table 1. OLS Regression of Carrying Capacity, Diversity, and Volatility on Time

Independent Variable	Dependent Variable		
	Carrying Capacity (No. of Issues Named)	Agenda Diversity (<i>H</i> -Statistic)	Issue Duration (Survival Rate)
Month:			
Beta	.04	.26	–.47
b	.000033	.00017	–.0027
SE of b	.000052	.00005	.0006
<i>p</i>	.60	.001	.000
Month ² :			
Beta	–.66	.35	.06
b	–.0000042	–.0000018	.0000029
SE of b	.0000004	.0000004	.0000048
<i>p</i>	.000	.000	.60
Constant	1.15	.60	–.58
SE	.08	.08	.81
Adjusted <i>R</i> ²	.42	.22	.21
<i>N</i>	140	140	83

telephone interviews by the Gallup Organization in 1987 has confounded the findings presented here. That is, the observed slight decline in the number of issues per person since the mid-1970s could reflect (1) a real process, (2) an artifact due to the use of telephone interviews, or (3) a combination of the two. We replicated the model (eq. [4]) with the CBS/*NYT* MIP data described earlier. The results show a similar trend as uncovered in the Gallup data that there has been no significant linear trend (beta of Time = .08, $p < .60$) but a significant and negative quadratic trend (beta of Time² = $-.35$, $p < .01$) in the number of issues per person over the last 15 years⁹ during which the CBS/*NYT* poll asked the MIP question. Thus, neither the Gallup data nor the CBS/*NYT* data support Hypothesis 1, which posits a monotonic increase in the public's issue-carrying capacity as measured by the number of issues per person. Instead, both data suggest an inverse-U-shaped trend in the carrying capacity of the public agenda with a decline in the recent years.

It should be noted that the CBS/*NYT* series does not exactly match the Gallup series throughout the comparable time frame (1979–94). As figure 2 shows, the two series were very close from 1979 to 1986,

9. The adjusted R^2 and standardized error of the regression are .09 and .05, respectively.

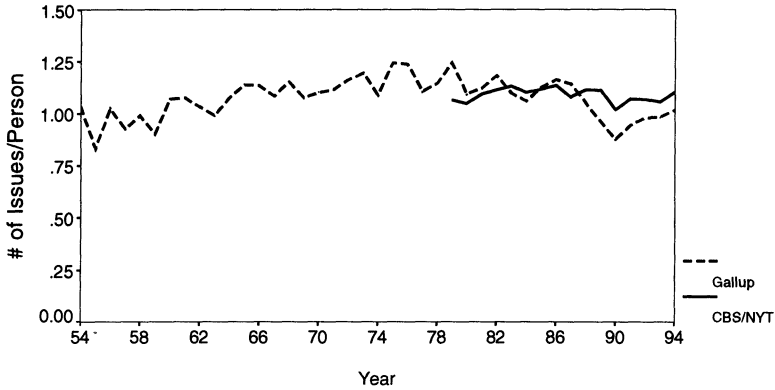


Figure 2. Issue-carrying capacity over time (CBS/NYT data)

but have been different ever since, with the CBS/NYT series being consistently on the top of the Gallup series. This cannot be taken as firm evidence for the impact of telephone interviews, however, because (1) when telephone interviews were used by CBS/NYT between 1979 and 1986, they did not register fewer responses than personal interviews used by Gallup during the same period, and (2) since 1987, when telephone interviews have been used by both pollsters, Gallup has always reported fewer responses than CBS/NYT (note the parallel lines between the two, with Gallup being consistently on the bottom from 1987 to 1994). It is important to note that, while we cannot rule out the impact of telephone interviews on the Gallup series, what matters here is the finding that both series do not show an increase in the public's issue-carrying capacity in the recent years.

Individual-level test. Table 2 reports the test of Hypothesis 1 with 10 Gallup raw data sets. Two patterns stand out. First, the better-educated respondents are always able to name more issues than the less educated. Second, the average number of issues named over time follows the same inverse-U-curve pattern found in the aggregate data. Using a two-way (education by year) ANOVA, we found that the observed difference in the ability of naming issues is significant both across educational levels and over time. For the main effect of education, $F = 23.87$ ($df = 15,806$ and 4 , $p < .001$), and for the main effect of year, $F = 158.72$ ($df = 15,806$ and 2 , $p < .001$). In addition, there is a modest interaction effect between education and year ($F = 2.25$, $df = 15,806$ and 8 , $p < .05$).

A posterior pairwise comparison further shows that the least-educated group (with 8 years or less schooling) scores significantly lower than the three highest-educated groups (high school graduate or beyond) in all 3 years examined. Those with 9–11 years of school-

Table 2. Issue-Carrying Capacity (Average Number of Issues Named per Person) by Education and Year

	1956	1973	1990	Mean
Education:				
Grade 8 or below	.93	1.07	.82	.97
Grades 9–11	1.04	1.11	.88	1.05
High school graduate	1.05	1.15	.93	1.06
Some college	1.09	1.18	.94	1.03
College graduate or beyond	1.14	1.17	.97	1.11
Mean	1.02	1.14	.94	1.05
N	6,310	6,069	3,442	15,821

NOTE.—“Don’t know,” “No opinion,” “No problem,” and “Refusal” are not counted as a valid issue.

ing nominate significantly fewer issues than those with some college or more in 2 of the 3 years. And those with a high school diploma also name significantly fewer issues than those with a college diploma in 2 out of 3 years.

Despite these differences in response patterns resulting from level of education, the same inverse U curve found in the aggregate data across time replicates here. Rising levels of education among the general public has not prompted a rising number of responses to the MIP question. Although this may seem surprising at first, numerous other measures of social behavior also fail to show any increase and one set of major measures, readership of daily newspapers, actually shows a decline over recent decades (Newspaper Association of America 1995, p. 4).

In summary, the individual-level data provide unambiguous evidence to support our assumption underlying Hypothesis 1 that education significantly enhances the public’s issue-carrying capacity. However, neither the aggregate nor the individual data suggest a monotonic increase in the public’s collective carrying capacity over time. Instead, an inverse U trend has been identified.

HYPOTHESIS 2: ISSUE DIVERSITY

Figure 3 displays the changes in the *H*-statistic from 1954 to 1994. As described above, the *H*-statistic represents the diversity (in terms of equality) of the public agenda in a given month. Figure 3 shows that, in general, the American public agenda appears to have been fairly diverse throughout the time period, as the *H*-value has mostly varied

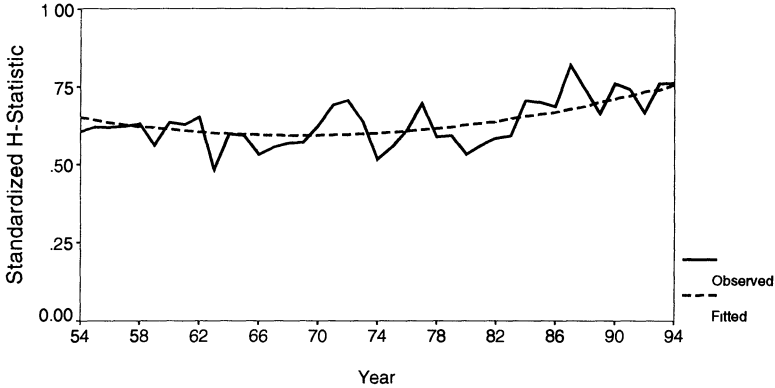


Figure 3. Issue diversity over time

within the range between .50 and .75. Despite considerable fluctuations, figure 3 shows a discernibly upward trend in the *H*-statistic throughout the entire 40 years.

The regression analysis results confirm the visual inspection. Shown in column 2 of table 1, the linear coefficient of Time is positive and significant ($\beta = .26, p < .001$). So is the quadratic term ($\beta = .35, p < .000$). In other words, the regression analysis suggests that while the overall trend of the public agenda in the last 4 decades is moving toward diversity, the diversification really took off in 1968 (the estimated minimum of the curve) and the trend has continued at an increasingly accelerated rate. Prior to 1968, there was actually a slightly downward trend.

Figure 4 provides a further visual illustration of the diversification of the American public agenda over time. Because the issue focus in the early years of our analysis was an extension of World War II, the entire range of Gallup data is included. During the first 20 years (1939–59), the public focused on one overriding issue, international relations, which consumed about 30 percent of the MIP polls throughout this 20-year span. Several other issues, including jobs, money, and government/politics, each attracted attention from 10 percent to 17 percent of the samples. The *H*-value for this pattern of distribution is .71.

In the next 20 years (1960–79), domestic politics (e.g., the civil rights movement and Watergate) became the number one issue in America, accounting for an average of 25 percent in the surveys. Concerns over monetary issues (e.g., inflation and cost of living) also rose above the 20 percent mark. In the international arena, the focus was now split between the Cold War and the Vietnam War. In addition, a group of minor issues were on the rise, mostly in domestic noneconomic areas such as law and order, social relations, and technologies. Compared

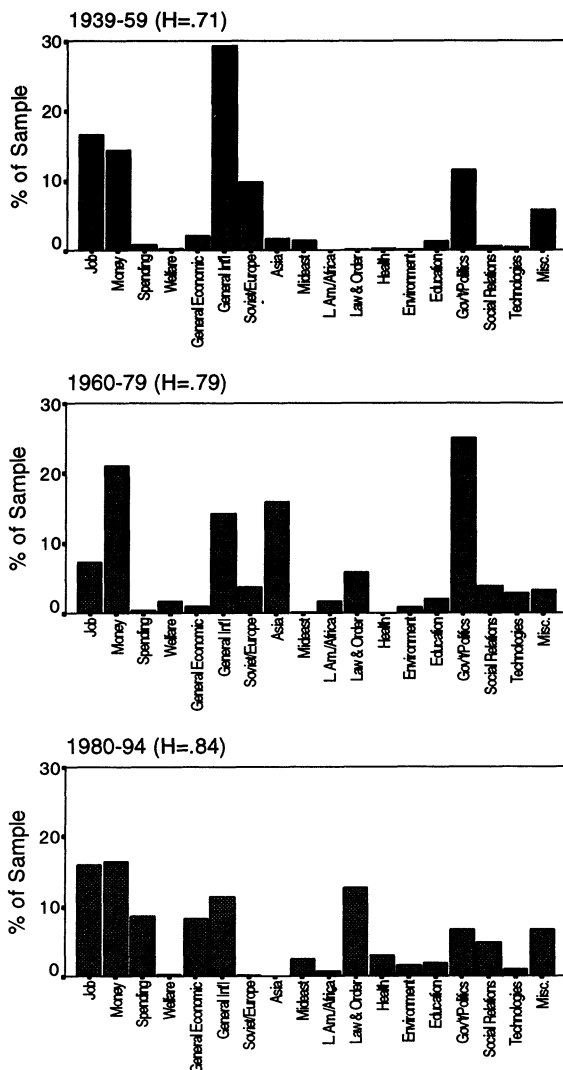


Figure 4. Issue distribution by selected decade. See app. A for information about the coding of issue categories.

to the pattern in 1939–59, the issue agenda in the 1960–70s was somewhat more diverse ($H = .79$).

The public agenda has continued to move away from single-issue monopoly to multiple-issue oligopoly in the last 15 years. Four “major” issues (jobs, money, general international problems, and law and order) each claimed 10–17 percent of the public agenda, and another four “minor” issues (spending, general economic problems, govern-

ment/politics, and social relations) each took a share of 5–10 percent (as compared to only one such minor issue in 1939–59 and two in 1960–79). The issue distribution in the 1980–94 period is even closer to rectangular ($H = .84$). In sum, across three blocks of time the value of H increases from .71 to .79 and then to .84.

Sensitivity analysis. As mentioned earlier, to ensure that the results are not an artifact of our issue categorization, we performed a sensitivity analysis for the testing of Hypothesis 2. First, out of the original 18 issues, we randomly chose two pairs of issues to be combined (e.g., issues 13 and 12, and issues 7 and 3, respectively), and retained the remaining 14 intact. By such we created a new series including 16 issues, with two of the issues being the collapsed pairs. We then applied the same regression to the new series to see how much the results would differ from the original model. The same procedure was repeated for three other series. The table in appendix B compares the key results with the original model. It is clear from the comparison that our issue categorization is quite robust since the four altered series produce results similar to those of the original model.

Individual-level test. Table 3 reports the standardized H -statistic for each of the five educational groups in 1956, 1973, and 1990. Several patterns are noticeable. First, there appears to be some difference in issue diversity across the educational groups, with the most striking contrast between the least educated and the remaining four groups. Second, there seems to be a monotonic increase over time in the diversity for each educational group, except the least educated. Finally, there tends to be an interaction between education and year as the gap

Table 3. Agenda Diversity (Average Standardized H -Statistic) by Education and Time

	1956	1973	1990	Mean
Education:				
Grade 8 or below	.624	.697	.620	.647
Grades 9–11	.664	.725	.715	.701
High school graduate	.627	.717	.731	.692
Some college	.615	.712	.748	.692
College graduate or beyond	.611	.710	.742	.688
Mean	.628	.712	.711	.684
<i>N</i>	6,310	6,069	3,442	15,821

NOTE.—The standardized H -statistic varies from 0 to 1, with 1 representing a completely diverse agenda. “Don’t know,” “No opinion,” “No problem,” and “Refusal” are excluded.

in the *H*-value across the educational groups has grown disproportionately over time.

As previously noted, since we cannot apply any inferential test to the *H*-values in table 3, we have conducted a series of hierarchical log-linear models of the original issue responses as a formal test of Hypothesis 2 at the individual level. The five three-way (issue by education by year) log-linear models are listed as numbers 1–5 in table 4. Model 1 is a null model since it does not contain any impact on issues by either the main effects of education and year, or the interaction effect between education and year. As one can expect, the model fits the data poorly, as shown by a large value of log-likelihood function, and correspondingly, a high significance level ($p < .001$).¹⁰ Models 2 and 3 are each a single main-effect model, with model 2 specifying the main effect of year on issue and model 3 specifying the main effect of education on issue. While both models still do not fit the data well, each represents a significant improvement over and above model 1 (see comparisons 1 and 2 in table 4),¹¹ which suggests that the distribution of the issues is unequal (i.e., diverse) both across education and time.¹²

Since education and year may be correlated (i.e., the educational level of the population improves over time), model 4 considers both main effects simultaneously to eliminate the overlap between the two in their impact on issue. The resulting goodness-of-fit of model 4 is still significant (i.e., the model still does not fit the data adequately), which suggests that there may be other variables responsible for the unequal distribution of issues. However, as comparisons 3–5 show, model 4 fits the data not only better than the null model (no. 1), but also better than either of the single main-effects models (nos. 2 and 3). As a final test, we contrasted model 4 with the full model (no. 5), which contains not only both main effects but also the interaction between the two. In fact, model 5 is a saturated model, which by definition fits the data perfectly. The difference between models 4 and 5 (reflected in comparison 6) confirms the significance of the interaction term. In other words, the impact of education on the issue diversity is not a constant, but a variable, over time. This is a pattern previously observed in table 3.

10. The significance of a log-linear model test against the null hypothesis is that there is no difference between a theoretical model and observed data. A high significance level suggests the difference between the model and the data to be highly significant and thus leads to the rejection of the null hypothesis.

11. The null hypothesis tested here is that there is no difference between the null model (no. 1) and the main-effects model (nos. 2 or 3). The resulting significance at .05 or beyond suggests that the null hypothesis should be rejected.

12. For additional evidence of the impact of both education and mass communication on agenda diversity, see Lasorsa (1991).

Table 4. Goodness-of-Fit of Three-Way Log-Linear Models (Issue Distribution by Education and Year)

	Parameters ^a	L ²	df	p
Model:				
1	I, E, Y, EY	10,231.68	224	.000
2	I, E, Y, EY, IY	417.58	192	.000
3	I, E, Y, EY, IE	9,318.69	160	.000
4	I, E, Y, EY, IY, IE	215.61	128	.000
5	I, E, Y, EY, IY, IE, IEY	0	0	1.000
Comparison:				
1	Model 1, model 2	9,814.11	32	.000
2	Model 1, model 3	912.99	64	.000
3	Model 1, model 4	10,016.07	96	.000
4	Model 2, model 3	201.97	64	.000
5	Model 2, model 4	9,103.08	32	.000
6	Model 4, model 5	215.61	128	.000

^a I = issue (17 categories); E = education (five categories); Y = year (three categories).

HYPOTHESIS 3: ISSUE VOLATILITY

Table 5 shows that 98 issue durations (i.e., the cycles encompassing the time between an issue's rise onto and fall from the public agenda) are identified from the procedure described earlier. Three issues (jobs, general international problems, and law and order) each have 10 or more cycles. On the other hand, seven issues (welfare, Mideast, Latin America/Africa, health, environment, education, and technology) have three or fewer cycles each. On the average, each cycle lasted 18.5 months, or a year and a half. However, there is great variability across issues. Therefore, the survival rate was calculated with a stratified model, which computes a unique baseline function for each of the 17 issue categories.

The regression analysis, using the survival rate as the dependent variable (defined in eq. [3]) and Time and Time² as the independent variables, provides strong evidence to support a linear version of Hypothesis 3 (beta = -.47, *p* < .001; see col. 3 of table 1). On the other hand, the quadratic coefficient is not significant (beta = .06, *p* < .60). Note that the linear coefficient is negative, which indicates that the probability an issue will survive once rising on the public agenda has become increasingly lower over the years. In other words, the issue cycle of the American public agenda has become shorter. Figure 5

Table 5. Number and Length of Issue Cycles

	Issue Cycles (<i>N</i>)	Average Duration (Months)	Last Time on the Agenda (Month/Year)
Issue:			
1. Jobs	14	15.1	6/94
2. Money	7	47.4	8/85
3. Spending	5	21.8	12/93
4. Welfare	3	2.3	1/73
5. Economy (general)	5	14.0	8/92
6. International (general)	13	25.2	12/90
7. Soviet/Eastern Europe	4	19.3	1/64
8. Asia	4	27.8	1/73
9. Mideast	2	4.5	4/91
10. Latin America/Africa	3	5.0	8/90
11. Law and order	12	10.3	12/92
12. Health	2	5.0	12/92
13. Environment	2	1.5	7/91
14. Education	3	3.7	12/92
15. Government/politics	8	40.8	8/92
16. Social relations	8	4.9	8/91
17. Technology	3	8.7	10/80
Total	98		
Mean	5.8	18.5	

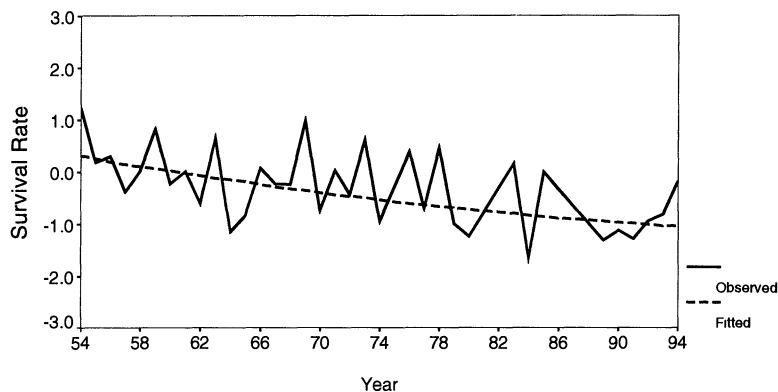


Figure 5. Issue duration over time

displays this long-term downward trend between October 1945, when the demise of a major issue (World War II) was first observed, and August 1994, when the last MIP poll was compiled in this study.

Of course, there are alternative explanations for this finding to be explored in future research. For example, this volatility may be related to speedier news coverage, which, thanks to advances in communication technologies, accelerates the rhythm of modern politics. Or consider that the cliché is true that we live in a more complex world than our forebears. Either of these conditions could account for the increased volatility of the public agenda in recent times. But the evidence also is consistent with the theorization discussed earlier that a collision between the expansive influence of education and the restrictive influence of limited agenda capacity could result in a more volatile public agenda.

Sensitivity analysis. As stated before, we coded any issue mentioned by 10 percent or more of the public as being on the public agenda. While the 10 percent threshold is based on the empirical work by Neuman (1990), we performed a sensitivity analysis to ease concerns over the arbitrariness of such a decision. Specifically, Hypothesis 3 was replicated with four new series based on different thresholds: 5 percent, 7.5 percent, 12.5 percent, and 15 percent. As shown in appendix C, models based on the thresholds of 5 percent, 7.5 percent, and 12.5 percent produce essentially the same results as the original 10 percent model does in that the linear term is significant and negative (i.e., survival rate of issues decreases over time) while the quadratic term is nonsignificant. The only exceptional case is when the cutoff point is set at 15 percent the linear term falls short of reaching significance ($p < .15$), largely because only a small number (58) of issues have ever attracted 15 percent or more of the public's attention. It is interesting to note that the original 10 percent threshold represents an optimal model, in terms of its explanatory power, as compared to the other four models using adjacent thresholds.

Conclusion

We started this study with three intertwined, and to some extent competing, hypotheses about the long-term trends in the American public's issue agenda: increases in (1) agenda-carrying capacity, (2) agenda diversity, and (3) issue volatility. These hypotheses have been tested with aggregate time series data covering 40 years. Hypotheses 1 and 2 also have been replicated with individual-level cross-sectional data consisting of 15,000 cases from 3 years stretching across 4 decades. While no significant linear increase in the carrying capacity is

found, our results provide unambiguously strong evidence for an increase in both the agenda diversity and issue volatility. The public agenda has been transformed from an era where one or two overriding issues dominated to the current stage where many voices compete for attention. This issue competition, in the absence of significant expansion of carrying capacity, leads to a faster rate of issue turnover on the public agenda. These basic findings about the public agenda are consistent with the proffered explanation that the volatility of contemporary public opinion is the result of a collision between two opposing forces, the expansive influence of education on awareness of public issues and the constraint imposed by the public agenda's limited capacity.

As a first attempt of its kind in the public agenda-setting literature, this study focuses on describing, rather than explaining, the trends in the American public's issue agenda. The only causal variable that has been proposed and tested in the study is education. There could be many other independent and/or confounding causes. In a longitudinal study of American public opinion between 1960 and 1988, William Mayer (1992) identified four classes of explanatory variables for the observed changes in issue attitudes and policy preferences: (a) generational replacement, (b) social and demographic change, (c) external events, and (d) mass media effects. While the changes in the generational and sociodemographic composition of the population were influential, he found external events to be the strongest agent of changes in public opinion.¹³ Since news coverage is often confounded with external events, Mayer considered media effects to be a "half" (i.e., partial) causal factor. Although our focus is different, salience rather than preference, we believe that Mayer's work is an instructive framework for a systematic analysis of what has caused the changes in the public's issue agenda as observed here. Beyond the role of external events, future research also should examine, for example, the connection between the ethnic diversity of the American population and issue diversity, and the linkage between the media agenda-setting function (McCombs and Shaw 1972) and issue volatility.

Future research also should examine the implications and consequences of the changes in the public issue agenda. For example, this study casts some new light on the mixed consequences of issue diversity. Although diversity frequently is hailed for its contribution to a pluralistic society, diversity also can lead to segmentation of society. More and more issues may appear on the agenda, but each issue at-

13. For example, education is one of the key demographic variables examined by Mayer, who concluded that "increased education did have some measurable influence on social and cultural issues, but even in the most auspicious cases, its effects were not especially large" (p. 300).

tracts fewer and fewer constituents. More research is needed to fully explore the long-term implications of issue diversity for the democratic process, especially when a new information environment with 500 or more channels is on the horizon.

Appendix A

Most Important Problem Codes

I. JOB

- 101. Unemployment
- 102. Unemployment/depression
- 103. Unemployment/recession
- 104. Recession
- 105. Recovery
- 106. Labor/unions/strike
- 107. Labor problems, labor management, Taft Hartley, strikes
- 108. Imports/loss of American jobs
- 138. Unemployment recession/depression
- 140. Balance of payment
- 143. Trade deficit
- 359. Demobilization
- 377. Teens' need for employment

II. MONEY

- 109. Inflation
- 110. Cost of living
- 111. Inflation/cost of living
- 112. Tax
- 113. Tax/cost of living
- 114. Food prices
- 115. Gasoline price
- 117. Housing cost
- 118. Wages
- 119. Interest rates
- 120. Savings and loans
- 121. Gold standard problem
- 379. Housing (shortage)

III. SPENDING

- 122. Budget/deficit/national debt
- 123. Government spending

- 124. Military spending
- 125. Social spending
- 126. Government spending too much for space
- 139. Reagan budget cuts
- 141. Military budget cuts

IV. WELFARE

- 127. Adequate relief
- 128. Old age pensions
- 130. Shortages (of welfare)
- 131. Social security/welfare
- 132. Too much welfare
- 142. “Fairness” issue: government policies favor rich

V. GENERAL ECONOMIC

- 129. Reconversion
- 134. General economic
- 135. Reaganomics
- 136. Farms
- 137. Industrial competitiveness declining
- 144. Spending more for industry
- 145. Other economy (when “general economy” is present)
- 146. Small business

VI. GENERAL INTERNATIONAL ISSUES

- 201. General war/peace/arms race/arms talks
- 202. World War II
- 209. Foreign aid
- 210. Defense/military/national security
- 211. Disarmament/nuclear disarmament
- 212. Atomic bomb
- 213. Atomic bomb, hydrogen bomb
- 214. Future of United Nations
- 215. Preparedness of navy and army
- 216. General international problems/foreign relations/foreign policy
- 217. Foreign policy, getting along with other nations/helping Europe
- 218. Failure of summit conference
- 219. SDI/space spending
- 220. Imprisoned flyers
- 241. Peace/war/nuclear war/China/Russia
- 244. Peace/war/atom bomb
- 245. Second rate nation prestige
- 246. Nuclear testing/arm race
- 371. Fear of war

VII. SOVIET/EUROPE

- 208. Afghanistan war, Russian invasion
- 221. Soviet
- 222. Relations/communications with Russia
- 223. Russia (threat of war with)
- 224. U-2 incident
- 225. Berlin Crisis

VIII. ASIA

- 203. Vietnam
- 204. Korea
- 226. Japan
- 227. Southeast Asia
- 228. Quemoy, Formosa, China, Communist blockade of offshore islands
- 229. China, Asia, Formosa, Far East
- 230. Communist Red China
- 231. Laos
- 232. Indochina
- 233. Korean Settlement

IX. MIDEAST

- 205. Gulf
- 206. Saddam Hussein
- 207. Middle East/Persian Gulf crisis
- 239. Suez Canal, Egypt
- 240. Situation in Algeria
- 242. Iranian situation

X. LATIN AMERICA/AFRICA

- 234. South-Central/Latin America
- 235. Cuban problem
- 236. Fear of communism in Cuba
- 237. Central America
- 238. Africa/Congo
- 248. Dominican Republic
- 255. Somalia
- 375. Iran/Contra
- 382. Haiti

XI. LAW AND ORDER

- 301. Crimes/juvenile delinquency
- 302. Terrorism/hijacking

- 303. Amnesty
- 304. Spying/espionage
- 305. CIA/FBI
- 306. Crime/law and order/riots
- 307. Lenient judiciary system
- 308. Supreme court
- 345. Drugs
- 381. Gun control

XII. HEALTH

- 309. Health care for the elderly
- 310. Health care
- 311. Number of people without health care
- 312. Rehabilitating returning veterans
- 313. Salk vaccine, polio
- 314. AIDS
- 346. Alcoholism

XIII. ENVIRONMENT

- 315. Environment
- 316. Water shortages
- 317. Water pollution
- 318. Litter and garbage
- 319. Air pollution
- 321. Nuclear power plant accidents
- 322. Nuclear test/wastes
- 372. Water/air pollution

XIV. EDUCATION

- 323. Education
- 324. Education costs (quality, tuition, credits)
- 325. Youth

XV. GOVERNMENT/POLITICAL

- 243. Communism in U.S.A.
- 247. Federal control/socialism
- 326. Government leadership
- 327. Political corruption
- 328. Watergate
- 329. Nixon
- 330. Distrust in government
- 331. Domestic politics, presidential elections

- 333. McCarthyism
- 334. Apathy
- 335. Moral
- 336. American public—the desire to get something for nothing
- 337. Religion
- 338. Religion and politics
- 339. School prayer
- 340. Racial/civil rights
- 341. Protest/demonstrations
- 342. Draft
- 343. College demonstrations; draft card burning
- 344. Campus unrest/riots
- 347. Abortion/pro and con
- 348. Women's rights
- 349. National unity
- 350. General unrest
- 370. Dissatisfaction with government
- 373. Communism/socialism
- 374. Big government

XVI. SOCIAL RELATIONS

- 351. Slums/urban renewal
- 352. Poverty/homeless
- 353. Food shortages
- 354. Population explosion
- 355. Immigration
- 356. Refugee problems
- 357. Aliens
- 358. Senior citizens
- 360. Communication/lack of/generation gap
- 361. Family problems/child rearing
- 362. Family problems/child rearing/parental discipline/alcoholism
- 363. Housing/slums/urban renewals/cities are dying
- 364. Busing
- 378. Teens' problems: employment/need for recreation
- 380. Racial strife

XVII. TECHNOLOGY

- 116. Energy
- 320. Energy crisis
- 365. Space
- 366. Technology
- 367. Transportation
- 368. Mass transportation

- 376. Automation
- 391. Traffic/accidents in traveling

XVIII. MISCELLANEOUS

- 401. Miscellaneous (general)
- 402. Miscellaneous (domestic)
- 403. Miscellaneous (foreign)
- 405. Others (please indicate in the coding sheet)/undesigned

Note. The numbers are not necessarily consecutive due to changes during the coding process. “Don’t know,” “No opinion,” “No problem,” and “Refusal” are not coded.

Appendix B

Table B1. Regressions of *H*-Statistic on Time (Standardized OLS Coefficients)

	Number of Issues				
	18	16 (Combining 13 with 12; 7 with 3)	16 (Combining 5 with 12; 8 with 2)	16 (Combining 4 with 15; 9 with 3)	16 (Combining 2 with 13; 10 with 11)
Parameter:					
Month	.26**	.26**	.44***	.25**	.31***
Month ²	.35***	.31***	.43***	.41***	.36***
Model fit:					
SE	.08	.08	.08	.07	.07
Adjusted <i>R</i> ²	.22	.20	.47	.28	.28
<i>N</i>	140	140	140	140	140

NOTE.—The 18-issue model is taken from col. 2 of table 1; the pairwise combinations in cols. 2–5 are randomly chosen.

** *p* < .01.
*** *p* < .001.

Appendix C

Table C1. Regressions of Survival Rate on Time (Standardized OLS Coefficients)

	Threshold				
	5.0%	7.5%	10.0%	12.5%	15.0%
Parameter:					
Month	-.28**	-.35***	-.47***	-.24*	-.20
Month ²	.09	-.03	.06	.20	.25
Model fit:					
SE	.82	.85	.81	.75	.73
Adjusted R ²	.07	.10	.21	.06	.05
N	133	101	83	69	58

NOTE.—The 10 percent model is taken from col. 3 of table 1.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

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