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Relationships between school taxes and town taxes in Vermont local government

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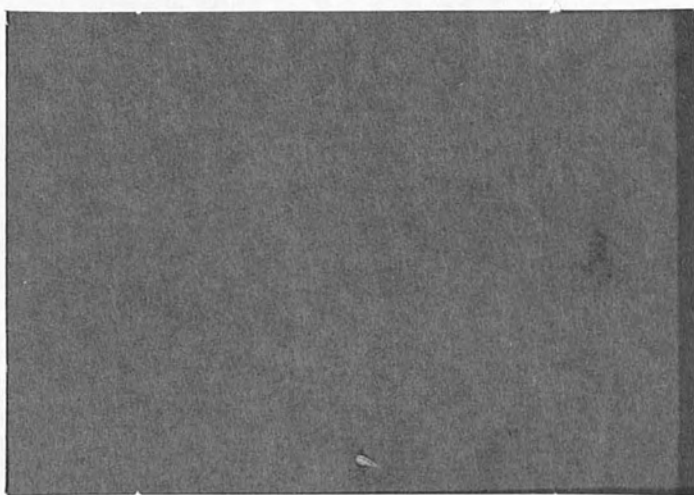
NUMBER 8

RELATIONSHIPS BETWEEN SCHOOL
TAXES AND TOWN TAXES IN VERMONT
LOCAL GOVERNMENT

LEONARD J. TASHMAN
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MICHAEL J. MUNSON
CHITTENDEN COUNTY REGIONAL
PLANNING COMMISSION

CENTER FOR
RESEARCH
ON VERMONT



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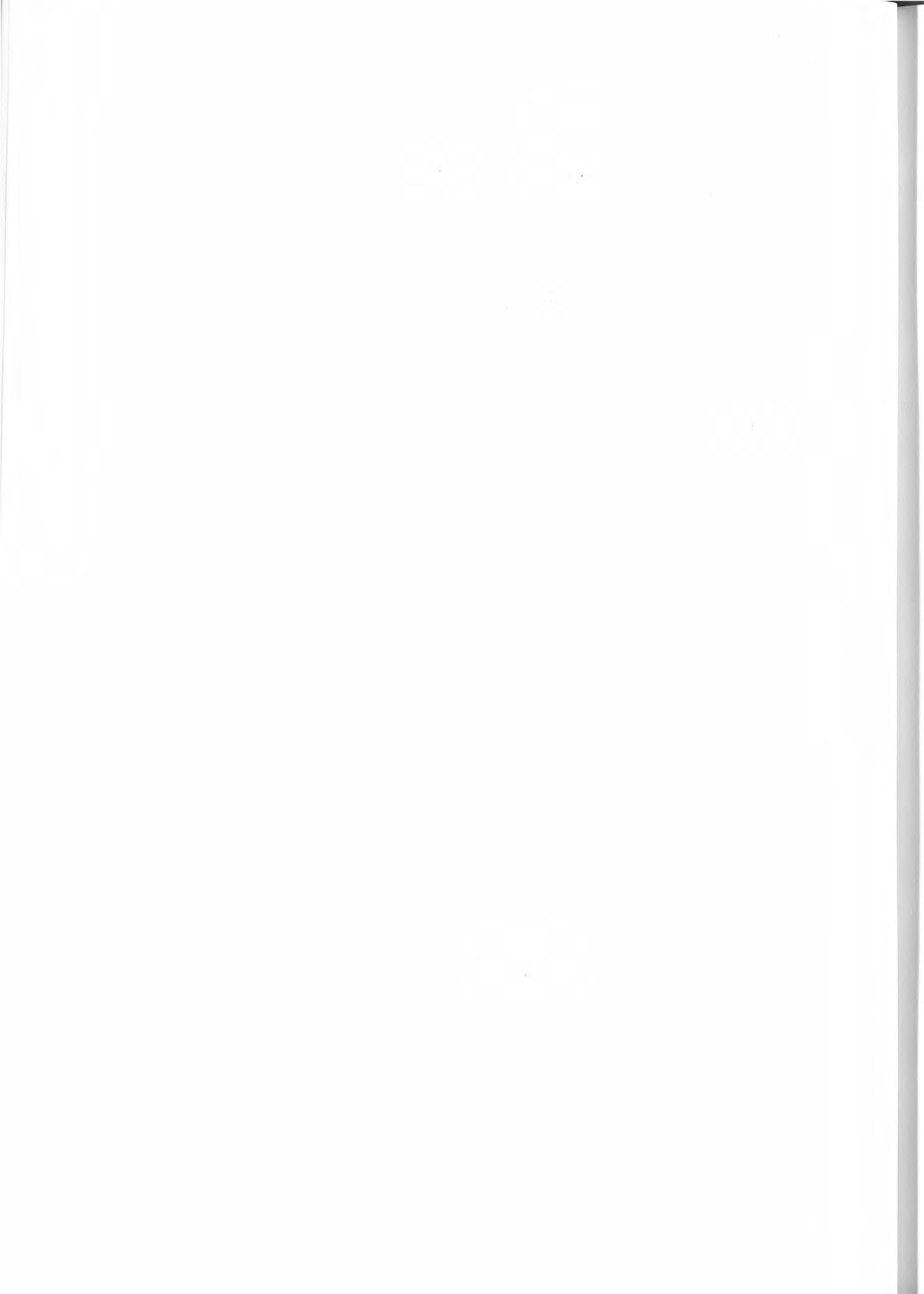
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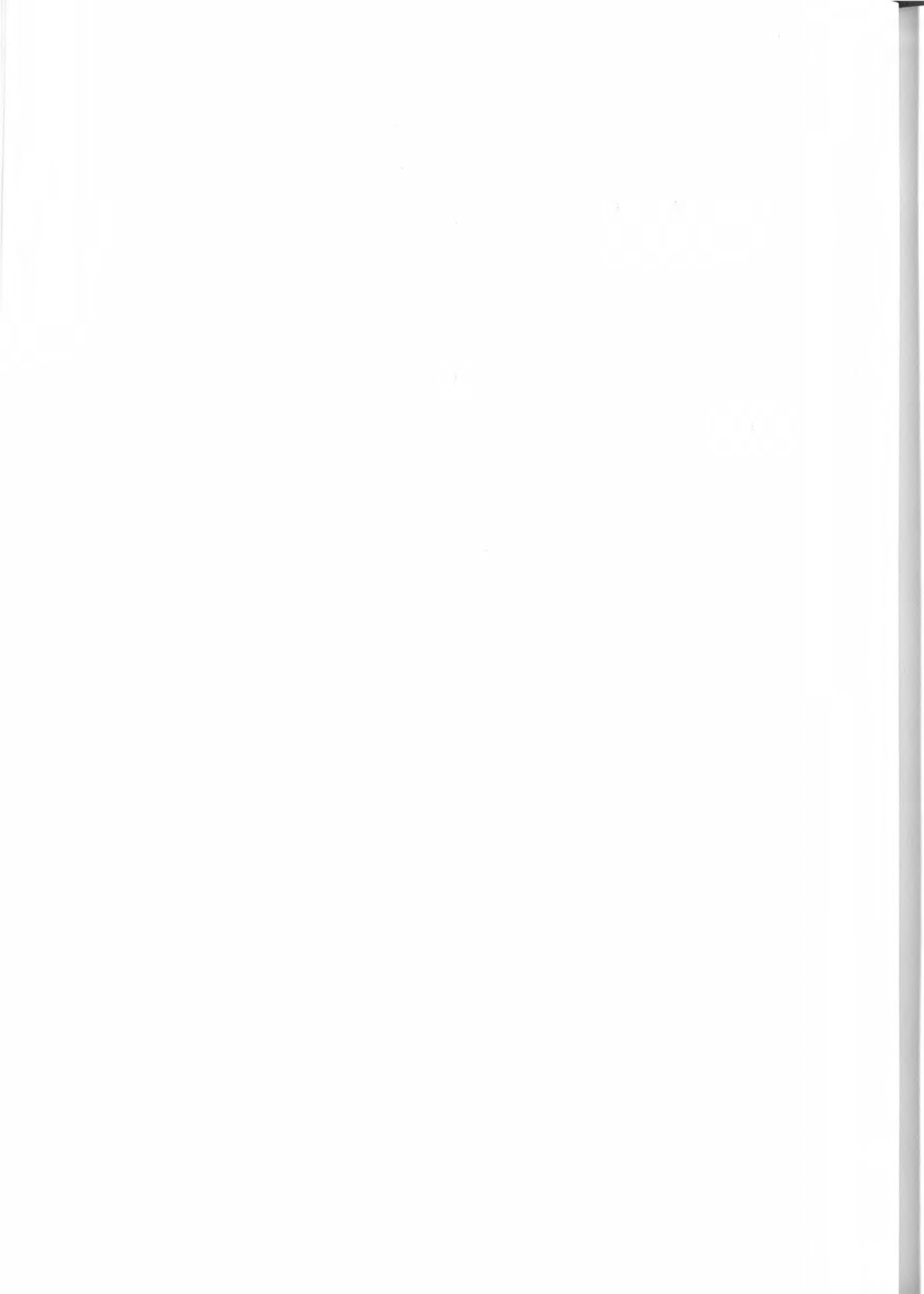
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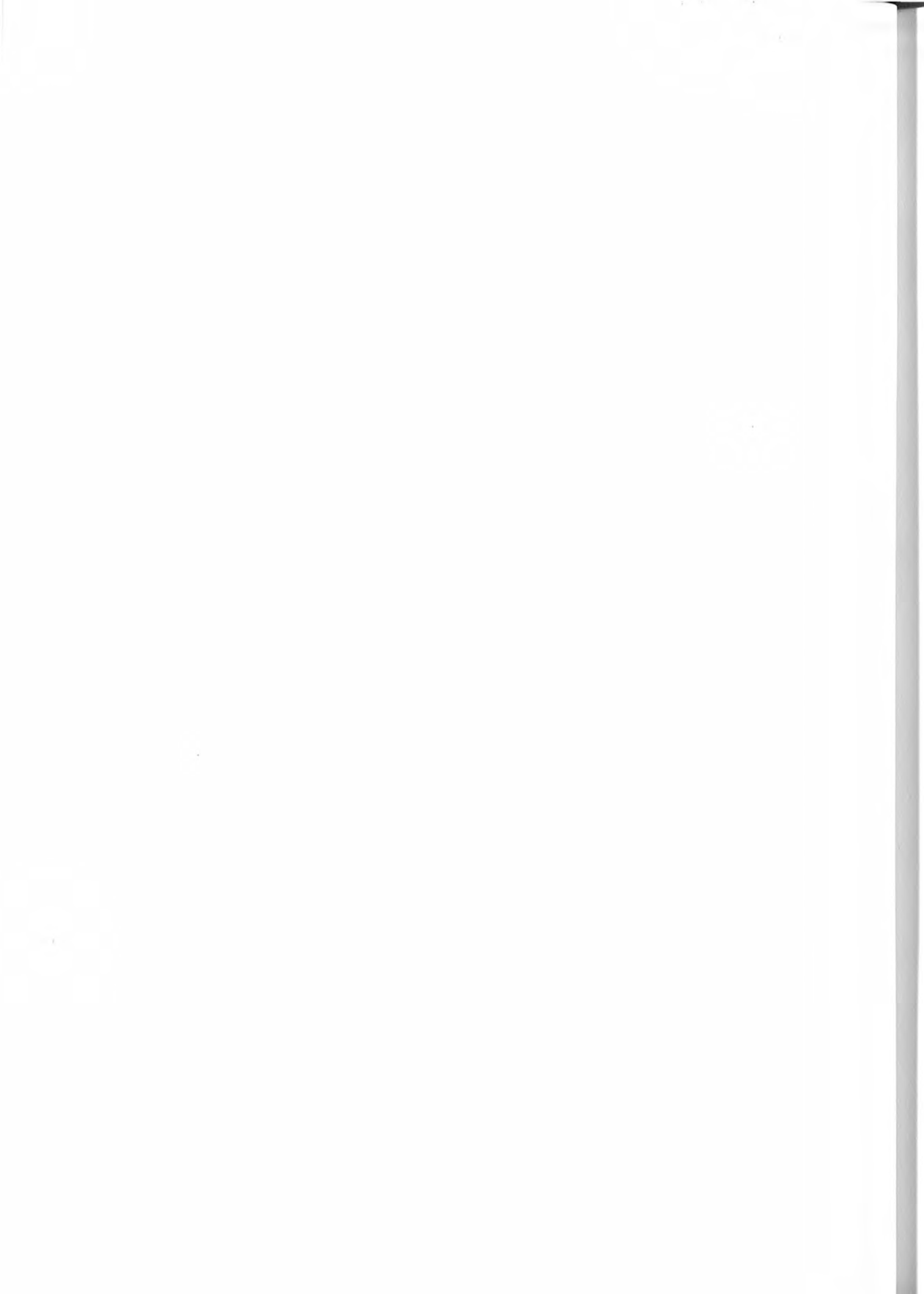
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Introduction

The struggle between taxpayers and spenders in local government brings out the best and the worst in us. It forces us to balance our fiscal capacity against our sense of responsibility for meeting the needs of the schools, the highways, and the town general fund. It is by no means a routine or even a very pleasant experience for most voters, but it is the essential exercise of direct democracy that still gratefully separates Vermont from the majority of states in the Union. Voting on budgets is the fuel that fired the strongest passions of Vermont municipalities.

We gather together in rooms to decide how much we should spend, as a community, on services we provide to all residents. We vote on the purchase of a new grader or a backhoe, on whether to give money to the Visiting Nurses, on how much the town officials should be paid, on the school budget. We vote these propositions, knowing that our property taxes will increase or decrease depending on how we exercise our legal discretion to set expenditure limits for the town and town school district. Each year we have a choice. Each year we have the right to say yes or no.

The basis for local taxation in Vermont is the appraised value of real and personal property. Property was once the principal source of revenue for state and local government,

but in recent years we have begun to lose confidence in its ability to support even the needs of towns and school districts, and we have turned to federal and state income tax sources for reinforcement. Still, we must vote to appropriate any monies, before they may be expended, from whatever source they emanate. It is the voting at a duly warned town meeting--this very populist process we have invented in Vermont--that is the subject of the following article.

Voting means making choices. If only one municipality were involved, we might make these choices with more facility, but there are two different municipalities, towns and school districts, with different warnings, different budgets, and usually different meetings, involved here. There are also two different legislative bodies, the selectmen and the school board, who are responsible for proposing, defending, and overseeing the expenditures of these budgets. One might even argue that there are two different electorates in many cases, depending on who turns out at each meeting and who votes for the two budgets.

The authors have set as the objective of their study some understanding of the relationship between town and school district budgets. They have used statistical summaries of 243 Vermont towns and school district budgets for three consecutive years. They have looked at the results of budget votes through the cold, dispassionate tube of a computer and have drawn conclusions from numbers about how voters make their choices.

The provocative question is how discretionary budgets really are today. How much freedom do taxpayers have to decide how much to appropriate each year for local government? Can they afford to ignore state standards on schools and risk the loss of state aid? Can they afford to appropriate less than \$50.00 a mile for town highway maintenance and risk the loss of highway aid? Can they ignore contract negotiations with teachers and unionized employees, health and safety codes, federal regulations on handicapped access, and the prevailing rate of inflation?

What matters most to selectmen and school directors is the bottom line. Sworn to maintain good roads and provide a suitable education for the children of the municipality, these worthy officials will not feel they have met their responsibilities if they do not act as strong advocates for sound budgets designed to fund the services they must provide. Taxpayers, strapped by tax burdens already heavier than they can bear, may not share the legislative body's ideas on what constitutes a sound budget. So the process of finding an amount agreeable to both groups often takes on an air of adversariness that resembles a military encounter.

We have seen the advent of the September budget in school districts that have failed to adopt a suitable budget in elections held in every month since March. We have seen meetings last until the early hours of the morning before a budget is voted. We have seen petitions submitted to remove

selectmen and school board members who have offended voters by conscious deficit spending. We have seen passion and courage and subterfuge and disorder at the polls.

This study by authors Tashman and Munson will not cool those passions or make the passage of suitable budgets in towns and school districts any easier, but it is a valuable contribution to the literature on Vermont local government. It confirms my suspicions that discretion in local budget votes is more myth than reality. We adopt budgets according to the size and income of the population, in relatively uniform patterns.

Local government in Vermont is a fertile area of investigation for students and scholars. The budgetary process itself holds the key to the dynamics that drive communities to new thresholds of voter involvement in public affairs. Tashman and Munson have opened the frontier.

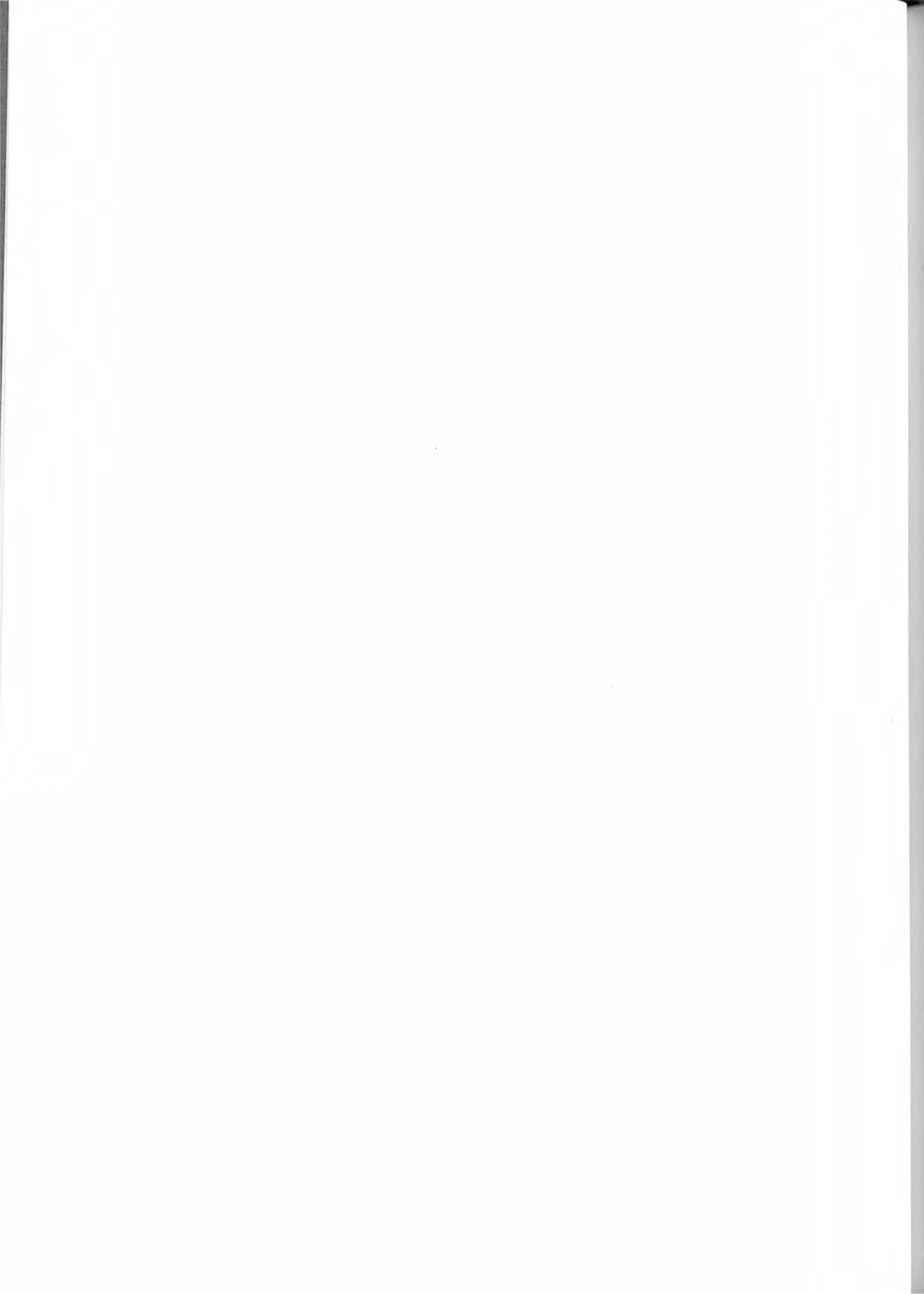
Paul S. Gillies

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RELATIONSHIPS BETWEEN SCHOOL TAXES
AND TOWN TAXES IN
VERMONT LOCAL GOVERNMENT

LEONARD J. TASHMAN

MICHAEL J. MUNSON



INTRODUCTION

In Vermont, as in all other states, the voting of local taxes is a perennial political issue. Each year residents of Vermont municipalities vote to approve budgets for school services as well as for non-school (i.e., town) services for the coming fiscal year. The results of these votes establish the local school and town tax rates that in turn determine the tax bill for which each property owner becomes liable. While the bottom line is the total amount of tax each resident will be asked to pay, there are interesting questions concerning the way in which tax dollars are divided between the school and non-school functions.

The most basic question is whether voter decisions to commit local taxes for one budget are influenced at all by the local-tax implications of the other budget. Alternatively stated, do voters attempt to achieve a balance between school-tax and town-tax commitments? In principle there are three types of behaviors possible:

1. Independence: School and town budgets are evaluated entirely on their individual merits--no relationship exists between the level of taxes committed to support the school budget and the level of taxes approved for town services;
2. Competition: School and town budgets are evaluated as alternative uses of the local tax dollar--a trade off (or inverse relationship) exists between school and town tax commitments;
3. Complementarity: School and tax budgets are evaluated as joint municipal services, to be funded more or less generously in unison--a positive (or direct) relationship exists between school- and town-tax commitments.

The form of voter behavior--independence, competition, or complementarity--has implications for local government planning and coordination. For example, do local officials increase the risk of voter disapproval of a proposed increment in the school budget if they recommend substantial increases in the town budget, as well? The form of relationship between school- and town-tax decisions can also shape a municipality's response to the receipt of state and federal aid. Will state aid to education monies, for example, be utilized entirely to (a) increase local school expenditure or (b) reduce local school taxes and indirectly increase local funding of town services?

In an attempt to determine relationships between school taxes and town taxes, we have compiled data for 243 of Vermont's local jurisdictions for three years: 1979, 1980, and 1981. For each locality we have created three-year averages of school taxes assessed and of town taxes assessed, with both measures expressed on a per household basis. We then correlated how voter tax commitments to the school and town budgets relate to the size of the community, the wealth of the community, and to each other.

Our results, while not always unambiguous, suggest two principal conclusions:

1. Community wealth and community size influence voter choices between the school and town budgets in opposite directions. Holding wealth constant, larger communities tend to allocate a greater share of local tax revenue to the town budget than do smaller communities. Holding size constant, richer communities tend to allocate a greater share of local revenues for the school budget than do poorer communities.

2. The dominant form of relationship between school- and town-tax commitments is complementarity, that is, localities that allocate above-average levels of taxes to the school budget also tend to allocate above-average levels of taxes to the town budget. There is little or no evidence from Vermont data that voters view the school and town programs as competing uses of the local tax dollar.

Part 1 presents the arguments that underlie hypotheses of competition and complementarity in voter choice and reports some empirical evidence from prior studies. Part 2 describes and compares the levels of school- and town-tax assessments among the 243 Vermont jurisdictions. Two hypotheses that emerge from this examination of the Vermont data are analyzed in parts 3 and 4. Finally in part 5 we assess the deficiencies of our analyses and present our plans for further research.¹

PART I. Competition or Complementarity in Voter Choices

The hypothesis of competition between school and non-school claims on the municipal tax base is based upon two assumptions. First, it assumes that voters are aware of the tax implications of their votes on the local budgets. Such awareness is probably a plausible assumption in the context of the town meeting tradition in Vermont, especially since the municipal tax base in Vermont localities is the highly stable and predictable property base.² It is not necessarily a plausible assumption in states that lack a tradition of local control or in states that permit localities to levy non-property taxes.

Second, the hypothesis assumes that there is a limit to the overall local tax burden voters are willing to bear in a particular fiscal year. The limit may have a political origin--a tax rate ceiling, for example--or an economic origin--a fixed proportion of income that voters are willing to allocate for municipal services.

Under these assumptions, it can be argued that school and town services must compete for a share of the aggregate property tax dollar. If voters find they must commit relatively large sums toward uncontrollable expenses in one budget, they will be reluctant to support discretionary outlays within the other budget. The necessity to authorize a substantial increase in tax revenues for road maintenance, for example, may impinge on voter willingness to endorse any increment in school taxes during the same year.

In her 1975 article in the National Tax Journal, Helen Ladd offers a similar statement of the competition hypothesis.

Potentially, the provision of non-educational public services specifically to business firms could induce a reduction in residents' demand for education services. This is based on the view that the public provision of business reduces the income available to residents to be spent on all₃ other goods and services, including public education.

Ladd found "no evidence to support the hypothesis of a negative impact on education expenditures of high non-school expenditures" from her data analyses.⁴

Nor did a study by Seymour Sacks, et al., find any evidence of competition between school and non-school claims on the municipal tax base. Results based on a national cross-section of ninety-five central cities led Sacks to conclude that "cities that have high (per capita) taxes in one domain also have high taxes in the other."⁵

Both the Ladd and Sacks studies suggest that any interdependence between the school and town budget levels is probably "weak" and reflects not competition but complementarity (Sacks used the term "reinforcement") in voter choice.

A complementarity hypothesis can be asserted on two distinct grounds. First, the residents of a municipality may have "voted by foot" for a community in which individuals have tastes for a mix of public and private goods similar to their own. Such homogeneous collections of voters may prefer high levels of public services (and taxes) in both domains of the municipal budget. This is to say that good schools, as well as good roads and recreational facilities, may well be complementary demands.

In addition, community zoning and subdivision regulations may be promulgated to achieve a balance between residential property and commercial/industrial development. Voters may believe that expansion of the community's commercial/industrial base will reduce or at least slow the rate of increase in required school tax rates. If so, their allocation of tax revenues to the town budget may be viewed as a vote toward

improvement of the community's infrastructure and, in turn, an investment toward attraction of new commerce and industry. Hence, higher town-tax levies during a fiscal year may be voted precisely because the school tax levy is high.

In summary, the relationship between school and town claims on the municipal revenue base can be driven both by competitive and by complementary forces. It is conceivable that the empirical findings of little or no correlation between school and town taxes reflect the net result or cancellation of competitive and complementary thrusts. The findings also are consistent with a hypothesis of independence in voter choices between school and town taxes. Still another explanation, however, emerges from our review of the Vermont data in the next section.

PART II. School and Town Revenues in Vermont Communities: Background Analysis

Prerequisite to an analysis of relationships between school and town revenues are several basic questions about the behavior of Vermont communities. In this section we will report new information about:

1. Local (property) tax revenues assessed in support of the school budget.
2. Local (property) tax revenues assessed in support of the town budget.
3. The relative shares of school and town tax revenues.

Annual data on local taxes by town are published in the Annual Report of the Vermont Division of Property Valuation and Review (DPVR). These data show taxes assessed for schools as well as total local taxes assessed. Hence, taxes assessed for the town budget can be derived by subtracting the school component from the total. At the time of this study, the latest available year of data was 1981.

Utilizing the DPVR annual figures, we have compiled a three-year average (1979-1981) of each community's school tax and town tax assessments. Any single year's data will reflect the many special circumstances that influence a community's budgetary decisions during a particular fiscal year. A three-year average "smooths" the annual data and, accordingly, should be more indicative of the community's underlying preferences for municipal services.

Moreover, in order to make meaningful inter-community comparisons, the data measuring total dollars of taxes assessed must be expressed on a per-unit basis, that is, they must be scaled for differences in community size. To accomplish this, tax dollars can be expressed on a per-capita basis (Sacks), on a per-pupil basis (Ladd) or upon a per-household basis. We have chosen the last-named. The behavior we are investigating involves three key actors: decision-making units (voters), paying units (property taxpayers), and consuming units (families). The best composite of the three is the household.

The best available data for the number of households in a community is the number of dwelling units (1980 census). Accordingly, we describe the behavior of Vermont communities on the basis of the three variables:

- S: School taxes assessed per household, 1979-1981 average
- T: Town taxes assessed per household, 1979-1981 average
- P: The school share (proportion) of total local taxes assessed, 1979-1981 average⁶

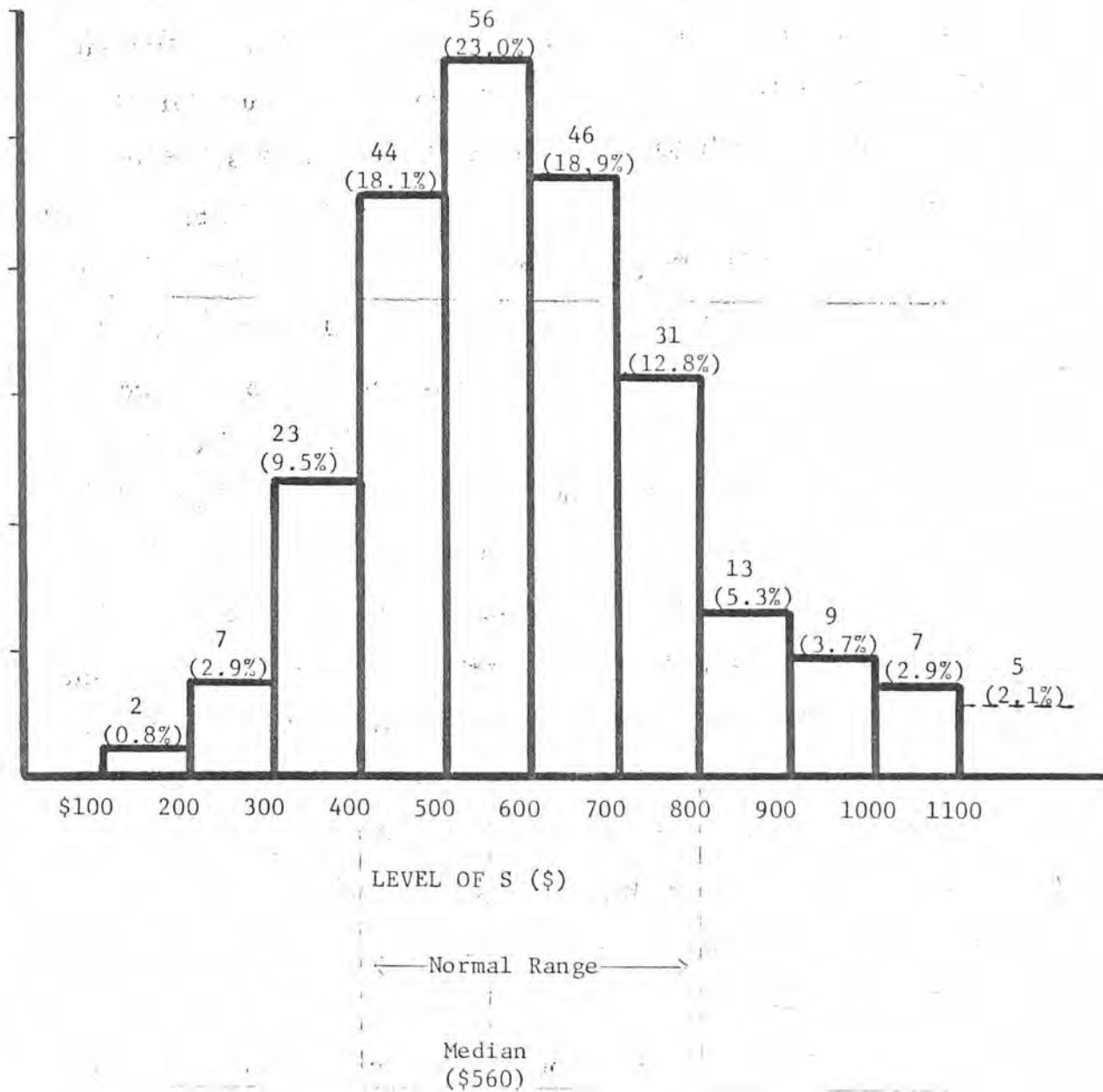
We were able to determine values for S, T, and P for 243 of Vermont's 251 taxing jurisdictions. Eight communities were omitted due to missing data in the DPVR Annual Reports.⁷ We now present a description of these results.

Chart 1 is a frequency distribution of variable S, the three-year average of school taxes assessed per household. Shown are the number and percentage of communities within each "class interval." The first class interval, for example, represents communities in which the level of school taxes lies between \$100 and \$200 per household.

The median level of S is \$560 and the (unweighted) mean is \$613. So the "average" Vermont community is assessing about \$600 a year in school taxes per household.⁸ The middle 50 percent of the communities--when arranged in order of S--raises between \$400 and \$800 per household, an interval that can be viewed as defining a "normal" range of school taxation. Chart 1 also reveals that there is considerable variation about the norm. Annual average school taxes per household

CHART 1

FREQUENCY DISTRIBUTION OF VERMONT TOWNS
 BY LEVEL OF SCHOOL TAXES ASSESSED PER HOUSEHOLD (S)*



*S: 1979 - 1981 average of school taxes assessed per household

Sources: Annual tax revenue and property valuation data are from Annual Reports (1980-82) of the Division of Property Valuation and Review (DPVR), Agency of Administration, State of Vermont; housing units and median household income are from the 1980 Census; the multiyear averages, ratios, and statistics were compiled by the authors.

are as low as \$132 (in Winhall) and as high as \$1,896 (Essex Junction).⁹

Chart 2 provides the frequency distribution of the variable T, the three-year average of town taxes assessed per household. The median T is \$230, the mean is \$253, and normal range is \$170 to \$290 per household. Hence, Vermont communities tend to assess almost \$2.50 of revenue for the school budget for each \$1.00 assessment for town services (Median S = \$560, Median T = \$230). Across the state, T ranged from a low of \$26 (Bloomfield) to a high of \$686 (Brattleboro).

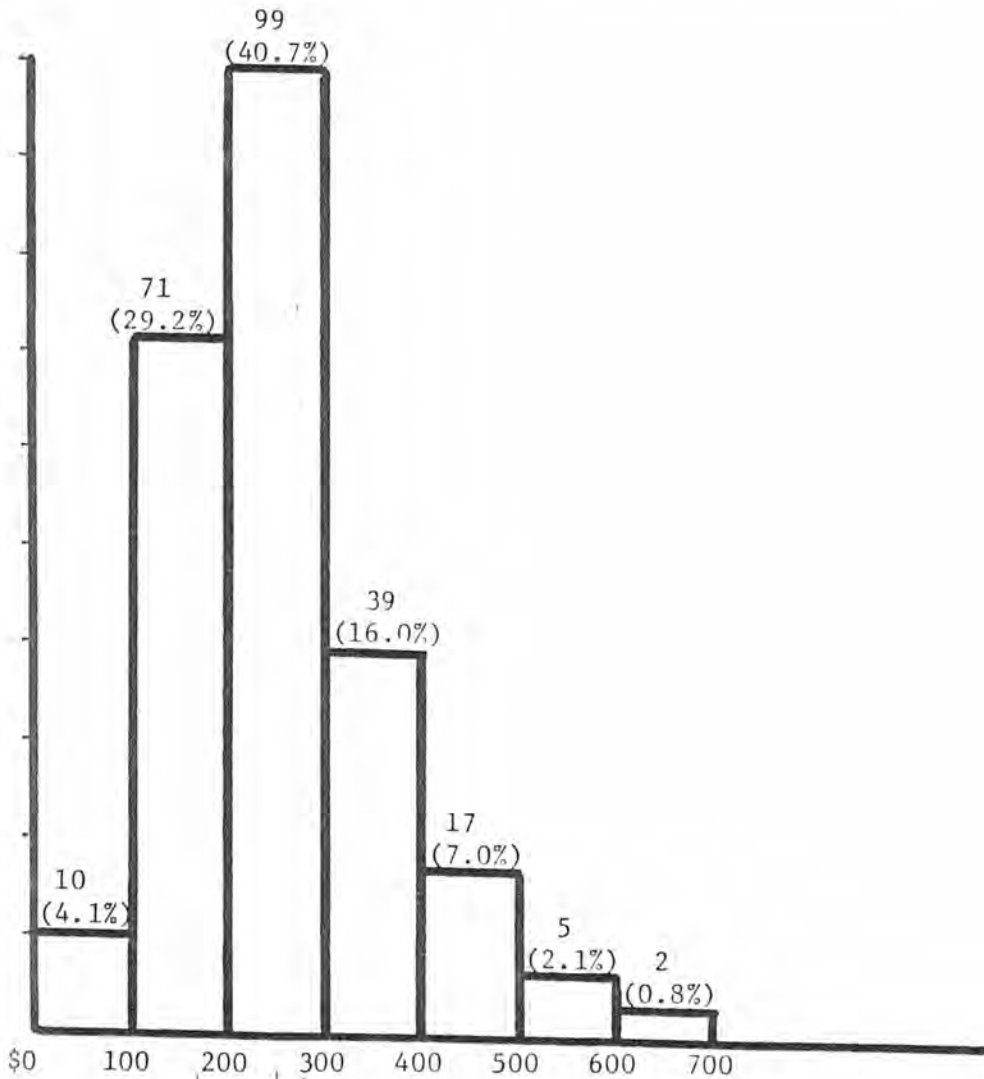
Information on the school share of total local revenues (P) is shown in chart 3. Both the mean and median are equal to 0.71. So, on the average, 71 percent of local property taxes were assessed for the school budget, 29 percent for town services. In the vast majority of communities, the school share fell between 60 and 80 percent. Richford was at the bottom of this distribution with a school share of 35 percent and Bloomfield was at the top with a school share of 95 percent.

In table 1 we report simple (pairwise) correlation coefficients among the four variables S, T, P, and H, where H denotes the number of households in a community (i.e., community size). We call your attention to two of these correlation coefficients.

The correlation between S and T, $r(S,T)$, is +0.464, which is a statistically significant but only moderately positive correlation.¹⁰ This correlation suggests that in those Vermont

CHART 2

FREQUENCY DISTRIBUTION OF VERMONT TOWNS
 BY LEVEL OF TOWN TAXES ASSESSED PER HOUSEHOLD (T)



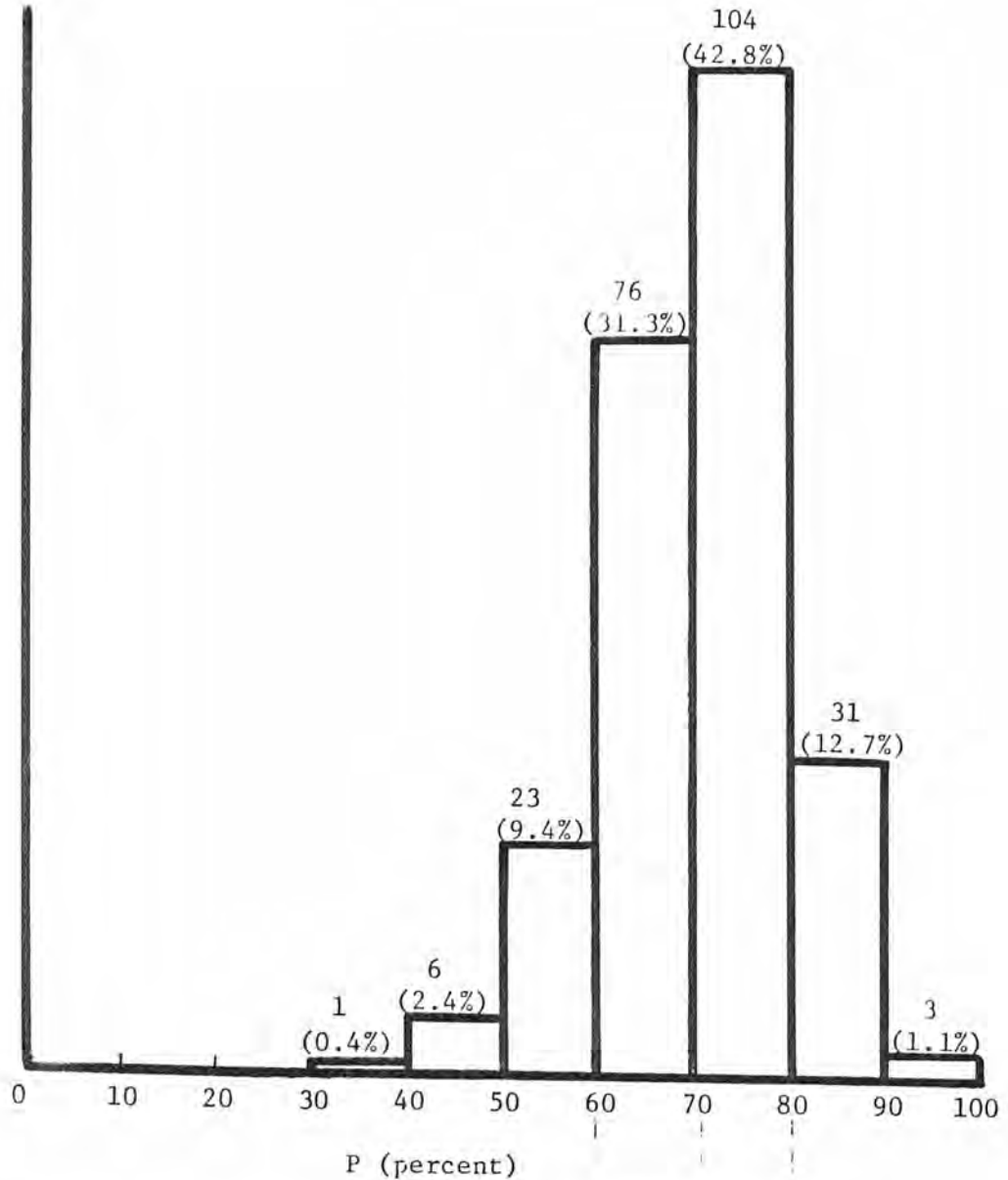
Normal Range
 170 290
 Median (\$253)

LEVEL OF T

Sources: Annual tax revenue and property valuation data are from Annual Reports (1980-82) of the Division of Property Valuation and Review (DPVR), Agency of Administration, State of Vermont; housing units and median household income are from the 1980 Census; the multiyear averages, ratios, and statistics were compiled by the authors.

CHART 3

FREQUENCY DISTRIBUTION OF VERMONT TOWNS
BY THE SCHOOL SHARE OF TOTAL LOCAL REVENUES (P)



75% of towns

Median
(71.0%)

Sources: Annual tax revenue and property valuation data are from Annual Reports (1980-82) of the Division of Property Valuation and Review (DPVR), Agency of Administration, State of Vermont; housing units and median household income are from the 1980 Census and statistics were compiled by the authors.

the multiyear averages, ratios,

TABLE 1

CORRELATION MATRIX
(N = 243 towns)

S = School taxes assessed per household

T = Town taxes assessed per household

P = School share of total local revenues

H = Number of households

H S T

S	0.151		
T	0.417	0.464*	
P	-0.244*	0.364	-0.591

*Statistically significant

Sources: Annual tax revenue and property valuation data are from Annual Reports (1980-82) of the Division of Property Valuation and Review (DPVR), Agency of Administration, State of Vermont; housing units and median household income are from the 1980 Census; the multiyear averages, ratios, and statistics were compiled by the authors.

towns where school taxes per dwelling are above average, town taxes per dwelling also tend to be above average. On the surface, this result supports a hypothesis of complementarity in voter preference for municipal services and is consistent with Sacks's findings in his analysis of ninety-five central cities across the country.

The correlation between P and H, $r(P,H)$, is -0.244, a low but statistically significant negative correlation. The result suggests a tendency for the school share of local revenues (P) to decline--and hence, the town share to increase--as community size increases. This finding is provocative.

Perhaps the relationship (form of interdependence) between school and town tax revenues differs between smaller and larger communities. Neither the Ladd nor the Sacks study incorporated community size as an explanatory variable, both assuming (implicitly) that correlations between S and T will not be affected by community size. It is possible, therefore, that an analysis which explicitly distinguishes size-classes of communities may reveal information about the relationship between S and T that would be "blurred" by correlations calculated for the aggregate of all communities, small and large.

Evidence to this effect comes from a recent study by one of the authors based on the eighteen towns in Chittenden County, Vermont.¹¹ Munson detected that the larger towns tended at once to have the highest town services budget (per

household) and the lowest school budget (per household). He speculated that this result reflected the effect of community size on the kinds of town services provided. For example, Burlington, the largest community in the study, provides its residents and businesses with a relatively full array of services, including police and fire protection, parks and recreation, sanitation and sewage, and road maintenance (street repair and snow removal). Bolton, the second smallest community in the county, devotes most of its town budget to but one function: road maintenance.

Recent data for Chittenden County are summarized in table 2.* The towns are listed from smallest to largest based on the number of housing units in 1980. The column labeled "Road Maintenance %" is the percentage of each community's town-service budget devoted to non-school expenditures. What we find is that, in the smaller communities (fewer than 1,500 housing units), road maintenance absorbs a majority of the town budget (52-66 percent) while in the larger communities (more than 1,500 housing units), road maintenance is allocated a minority (13-42 percent) of the town budget. At least in Chittenden County, growth in size induces a broadening of the array of town services provided.

*Under ideal conditions these data would describe expenditures for all Vermont municipalities. Unfortunately, the only source of expenditure data is individual town reports, and these do not follow a uniform format. The only tabulated expenditure data were those prepared by the Chittenden County Regional Planning Commission.

TABLE 2

Percentage of 1981 Non-School Expenditures Allocated to Road Maintenance in Chittenden County
(Municipalities arrayed by number of housing units in 1980)
(N = 18)

	<u>Housing Units</u>	<u>Road Maintenance %</u>
St. George	241	15.8 ¹
Bolton	359	64.9
Huntington	448	63.5
Westford	468	53.6
Underhill	751	52.5
Hinesburg	1,025	58.1
Charlotte	1,043	66.9 ²
Richmond	1,071	60.3 ²
Jericho	1,078	60.6
Williston	1,204	57.6
Shelburne	1,719	24.5
Essex Town	2,279	24.7
Milton	2,321	41.7
Winooski	2,403	18.8
Essex Jct.	2,547	33.4
S. Burlington	3,972	19.4
Colchester	4,566	21.1 ³
Burlington	13,767	19.7 ³

¹St. George has 5.65 miles of public roads and no public buildings.

²Richmond data are for 1980.

³Expenditures on solid waste disposal are included in street department expenditures.

Source: Data taken from "Economic and Miscellaneous Data Report: 1982," Chittenden County Regional Planning Commission. Compiled as part of the commission's ongoing study of local municipal finances by Michael J. Munson in 1983.

Road maintenance is a distinctive category in the town budget. In any fiscal year there is a minimum level that must be expended, which depends upon weather and street conditions. Nothing generates citizen complaints faster than unplowed or impassable roads. But beyond the level required for adequate conveyance of vehicles, there is little incremental benefit to additional road maintenance expenditures.

Munson describes the road maintenance function, therefore, as a relatively non-discretionary budget component. In comparison to most other types of town services, required outlays for road maintenance are prescribed by conditions external to the local economy; hence, the road maintenance budget should be relatively insensitive to budgetary requirements for other town services.

This argument provides a potential explanation for the evidence that P , the school share of local tax revenues, tends to decline as N , community size, increases. With growth in size as we proceed from smaller to larger, communities tend to commit increasing amounts of tax revenue toward a broadening of the set of town services offered, in addition to maintaining their relatively non-discretionary support for road maintenance. Thus, tax revenues for town services will rise as community size expands. Since school revenues per dwelling bear little or no relationship to community size,¹² the effect of growth in size (other things being equal) is to reduce the school share of local revenues.

PART III. The Effects of Size and Wealth

The correlation evidence presented in part 2 affords at best an impression of the relationship between community size and local tax choices. A more formal investigation of these relationships would require that other determinants of local tax choices be held constant. For example, voter choices between school and town services may be influenced by variables such as (1) the number of public school children per household, (2) housing density (number of households per square mile of land area), (3) the mix of property valuation between residential and "business" property, and (4) the wealth of the municipal voters. Of these, the last--community wealth--is certainly the most critical factor. In an affluent community, voters can finance both good schools and good municipal services at reasonable tax rates; a poor community, in contrast, cannot acquire much of either, except at burdensome tax rates.

Positive relationships between local school spending and local wealth have been documented by numerous studies covering virtually every state in the nation. In fact, it has been the intent of both federal and state court decisions to mitigate, if not eliminate, the wealth dependence of the financing of education in local communities.

In Vermont, as well as in other states which employ an "equalizing formula" for distribution of state and local

school districts, there is an additional reason to expect a positive (direct) relationship between school taxes and wealth. Not only does school expenditure tend to increase with wealth, but since state aid is distributed in inverse relation to wealth, the local tax share of school spending increases as wealth increases. Alternatively stated, the wealthier the community, the larger the share of each dollar of the school budget that must be financed from local revenues.

Hence, it is reasonable to posit that local school-tax decisions are closely wealth-dependent (correlated with community-wealth) while local town-tax decisions are less wealth-dependent than they are size-dependent (correlated with community-size). More technically, we offer the following pair of hypotheses:

Hypothesis (1a): If community size is held constant (i.e., if all communities had the same number of households), then school tax revenues will tend to increase as community wealth increases, both absolutely and as a proportion of total local revenues. In symbolic terms, as wealth (W) grows, holding size (H) constant, both S (school taxes) and P (school share of total local revenues) will increase.

Hypothesis (1b): If community wealth is held constant, tax revenues assessed for town services will tend to increase as community size increases, both absolutely and as a proportion of total local revenues. Symbolically, as H (size) increases, holding W (wealth) constant, T (town taxes) will rise and P (school share of total local revenues) will fall.

Several different statistical methods can be used to test the validity of our hypotheses, including multiple regression and multiple analysis of variance (MANOVA). The

approach we have taken here, while lacking the elegance of the multivariate techniques, is far simpler to understand and provides, as it turns out, qualitatively similar results.

We begin with measurements of the size and wealth of each community. Community-size, as previously noted, is measured by the number of households in a locality (1980 Census) and denoted by H .

Our measurement of community-wealth (W) is designed to incorporate both the income and property components of the wealth of community households. For the income component, we use Median Household Income (1980 Census). The property component is derived from the 1980 equalized fair market value of residential property in a community (DPVR 1981 Annual Report). Following a procedure by McMahon,¹³ we converted the property valuation data for each community into a flow of "property income." In essence, property income represents the annual interest income that can be derived by investing the equity value of residential property at current interest rates.

Our community-wealth variable is the sum of median household income (1980) and "property income" per household (1980). It can be interpreted as a community's average income from earnings, transfer payments, and property.

The next step involved the grouping of individual communities into size and wealth brackets. Four community-size brackets were defined: fewer than 400 households, 400-799

households, 800-1,999 households, and 2,000 or more households. Likewise, four community-wealth brackets were created: less than \$13,500; \$13,500-\$15,999; \$16,000-\$18,499; and \$18,500 and over.

Within each community-size bracket, we determined the correlation coefficient between community-wealth (W) and each of our three behavioral variables: S (school taxes), T (town taxes), and P (school share of total local revenues). These correlations, reported in table 4 (see p. 23), show the relationship between tax behaviors and wealth, holding community-size constant.¹⁴

In addition, within each community-wealth bracket, we calculated the correlation coefficients between community-size (H) and each of S, T, and P. These correlations, reported in table 4, relate taxing behavior and community-size, with community-wealth held constant.

The results reported in tables 3 and 4 enable us to assess hypotheses (1a) and (1b).

Hypothesis (1a): If community size is held constant (i.e., if all communities had the same number of households), then school tax revenues will tend to increase as community wealth increases, both absolutely and as a proportion of total local revenues. In symbolic terms, as wealth (W) grows, holding size (H) constant, both S (school taxes) and P (school share of local revenues) will increase.

If (1a) is sound, then we should expect that within each community-size bracket in table 3 there is:

1. A positive correlation between W and S--suggesting that, as wealth increases, school tax revenues per household tend to increase as well.

TABLE 3

Correlations with Community Wealth

Correlation Coeff. between Community Wealth (W) and:	Community-Size Brackets (No. of Households)			
	Less than 400 (n=74)	400-799 (n=84)	800-1999 (n=64)	2000 and over (n=21)
School Taxes (S)	0.427	0.374	0.722	0.817
Town Taxes (T)	0.253	0.301	0.307	0.194
School Share (P)	0.054	0.083	0.241	0.800
Lowest r that is significantly different from zero at $\alpha = 0.10$	0.195	0.183	0.211	0.378
Least significant difference between $r(W,S)$ and $r(W,T)$ at $\alpha = 0.10$	0.277	0.255	0.299	0.549

Sources: Annual tax revenue and property valuation data are from Annual Reports (1980-82) of the Division of Property Valuation and Review (DFVR), Agency of Administration, State of Vermont; housing units and median household income are from the 1980 Census; the multiyear averages, ratios, and statistics were compiled by the authors.

TABLE 4

Correlations with Community Size

Correlation Coeff. between Community Size (H) and:	Community-Wealth Bracket			
	Less than \$13,500 (n=42)	\$13,500- \$15,999 (n=81)	\$16,000- \$18,500 (n=68)	\$18,500 and over (n=52)
School Taxes (S)	-0.050	-0.023	0.096	0.326
Town Taxes (T)	0.104	0.467	0.394	0.430
School Share (P)	-0.137	-0.406	-0.216	-0.198
Lowest r that is significantly different from zero at $\alpha = 0.10$	0.257	0.183	0.211	0.231
Least significant difference between $r(H,S)$ and $r(H,T)$ at $\alpha = 0.10$	0.374	0.264	0.290	0.333

Sources: Annual tax revenue and property valuation data are from Annual Reports (1980-82) of the Division of Property Valuation and Review (DPVR), Agency of Administration, State of Vermont; housing units and median household income are from the 1980 Census; the multiyear averages, ratios, and statistics were compiled by the authors.

2. A positive correlation between W and P--signifying that, as wealth increases, the school proportion of local tax revenues tends to increase as well.
3. A higher (more positive) correlation between W and S than between W and T--implying that school tax revenues are more closely related to community-wealth than are town tax revenues.

Precisely these results, however, are found in only one of the four community-size brackets--2,000 households or more. Here the correlation coefficients $r(W,S)$ and $r(W,P)$ are quite high (0.817 and 0.800, respectively) and readily exceed the minimum correlation required for statistical significance at the 10-percent level (shown as 0.378 in the last column, the next to the bottom row). Although S is far more highly correlated with W than T is (0.817 vs. 0.194), it barely exceeds the 0.549 minimum difference for statistical significance at the 10-percent level.

Had this configuration of correlations emerged right across the community-size brackets, we would have dramatic confirmation of hypothesis (1a). The remaining results, however, are observably weaker: while we do find significantly positive correlations between W and S, the correlations between W and P are not significantly above zero.

Finally, we can observe that $r(W,S)$ is higher than $r(W,T)$ in all four community-size brackets--the difference between $r(W,S)$ and $r(W,T)$ being statistically significant at $\alpha=.10$ in the two largest size-brackets. Thus, there is moderate empirical support for the belief that school tax levels are significantly more wealth-related than are town tax levels.

Hypothesis (1b): If community wealth is held constant, tax revenues assessed for town services will tend to increase as community size increases, both absolutely and as a proportion of total local revenues. Symbolically, as H (size) increases, holding W (wealth) constant, T (town taxes) will rise and P (school share of total local revenues) will fall.

If hypothesis (1b) is sound, then the coefficients in table 4 should reveal:

1. Positive correlations between T and H.
2. Negative correlations between H and P--because, as H increases, the town proportion of local revenues is expected to rise; hence, the school proportion (P) will fall.
3. Correlations for H and T that are higher than the analogous correlations for H and S.

The results for each of the middle two wealth-brackets provide statistically significant support for hypothesis (1b) in all three respects. T is positively correlated with H, P is negatively correlated with H, and $r(H,T)$ is significantly higher than $r(H,S)$.

In the wealthiest communities (the last column), the correlations all have the hypothesized sign, but the only statistically significant result is the positive correlation for H and T (0.430). The correlation for H and P is too low for significance even at $\alpha=.10$, and $r(H,T)$ does not exceed $r(H,S)$ by a statistically significant amount. Finally, in the wealth-bracket representing the poorest town, nothing but "noise" (insignificant correlations) emerges.

Overall, we consider the evidence from tables 3 and 4 to be qualitatively supportive of hypothesis (1), although the observed pattern of generally weak correlations is not conclusive.

Much more satisfactory is the evidence displayed in table 5, for the twenty-one communities containing at least 2,000 households. These twenty-one communities, with a total of 82,587 households in 1980, accounted for 37 percent of all Vermont households that year.

In table 5, the communities are listed in increasing order of community-wealth, from the poorest--St. Albans--to the wealthiest "urban" community--Essex Junction. Among this group, Swanton is the median in terms of community-wealth; therefore, we may refer to the ten towns following Swanton as the "relatively wealthy" communities and the ten towns preceding Swanton as the "relatively poor" communities.

Since we have isolated the "large" communities--those that can be expected to provide the fullest array of town services--we would expect that wealth differences should be associated principally with differences in school tax levels rather than town tax levels (hypothesis [1a]). In turn, the school proportion of total local revenues (P) should be higher for the relatively wealthy (large) communities than for the relatively poor (large) communities.

Support for this hypothesis from table 5 is overwhelming.

1. Among the ten relatively poor towns, the school share (P) varies from 49.9 to 65.2 percent with a median of 56 percent. In seven of these ten communities, P is below 60 percent. Among the relatively wealthy towns, the school share lies within the range, 60.8-84.7 percent, with a median of 68.5 percent.

TABLE 5

Comparisons between Wealthy and Poor Urban Communities

Community (Listed from low to high in terms of community-wealth)	School Share P	School Taxes S	Town Taxes T	<u>MEDIANS</u>
1. St. Albans	58.0%	\$453	\$329	
2. Barre City	54.6	394	328	
3. Newport	55.1	517	421	
4. Winooski	65.2	456	244	
5. Burlington	56.8	572	435	P = 56.0%
6. Rockingham	52.3	669	609	S = \$540
7. Brattleboro	52.1	747	686	T = \$382
8. St. Johnsbury	64.0	562	316	
9. Bennington	64.7	628	342	
10. Rutland	49.9	499	500	
(Median: Swanton)	72.8	498	186	
11. Montpelier	60.8	719	463	
12. Middlebury	68.9	877	397	
13. Hartford	61.2	785	499	
14. Springfield	61.0	860	549	
15. Milton	71.0	606	247	P = 68.5%
16. Barre Town	62.6	680	405	S = \$823
17. Colchester	74.1	637	223	T = \$414
18. Essex Town	68.1	1173	567	
19. South Burlington	73.9	1361	482	
20. Essex Junction	84.2	1869	349	

Sources: Annual tax revenue and property valuation data are from Annual Reports (1980-82) of the Division of Property Valuation and Review (DPVR), Agency of Administration, State of Vermont; housing units and median household income are from the 1980 Census; the multiyear averages, ratios, and statistics were compiled by the authors.

2. Town tax levels (T) do not differ very much between the relatively poor and the relatively wealthy communities. As shown in table 6 (see p. 30), the median T is \$382 in the ten relatively poor towns, \$434 in the ten relatively wealthy towns, a difference of less than 15 percent. In contrast, the median S (\$823) in the relatively wealthy towns is 52 percent higher than the median S (\$540) in the relatively poor towns.

PART IV. Correlations between School and Town Taxes

The analysis of the preceding section concerned the effects of community size and community wealth on the levels and mix of school and town tax revenues. On balance, the results suggested the importance of community size as a factor influencing the taxing behaviors. In this section, we extend our previous results to investigate the form of relationship between school and town tax levels and whether the form of relationship differs as a function of community size.

Hypothesis 2: The form of relationship between school tax revenues per household (S) and town tax revenues per household (T) will change as community size increases. Competition in voter choices is more likely to emerge among small communities than among large communities. Conversely, complementarity in voter choices has a higher probability of being detected within a class of large communities than within a class of small communities.

The rationale for the second hypothesis requires a bit of additional explanation. As discussed previously, in the smaller communities in Chittenden County (table 2) town taxes are allocated largely for road maintenance, a relatively non-discretionary function. In those small jurisdictions that face a requirement to levy high tax rates for road

maintenance, voters can limit their total tax liability only by exercising discretion upon (i.e., restricting) the size of the school budget.

In larger communities, voter choices must encompass a broader array of town services in addition to public schooling. Hence, the necessity of high tax assessment for road maintenance may lead voters to fund other, more discretionary town services at a lower level. Competition then may be diffused among the components of the town budget and not manifest itself in the choice between town and school services.

Of course, differences in community size alone cannot be expected to explain all differences in voter preferences between school and town services. The demographic composition of a community's voters as well as the locality's zoning and subdivision policies will affect the types of services demanded. Properly controlling for these factors is difficult, if not impossible, to do statistically. Our expression of hypothesis 2 recognizes this difficulty: It asserts implicitly that, above and beyond these other considerations, an increase in community size accentuates a tendency toward complementarity in voter choices, and conversely, a decrease in community size reinforces a tendency toward competition in voter choices.

Shown in table 6 are correlations between S (school taxes) and T (town taxes) for each community-size bracket. Unqualified support for hypothesis 2 would require that the degree of correlation between S and T becomes increasingly

TABLE 6

Correlation Coefficients for School Taxes (S) and Town Taxes (T)

<u>Community-Size Bracket</u>	<u>Simple Correlation: r(S,T)</u>	<u>Wealth-Adjusted Correlation r(S,T/W)</u>
(Number of Households)		
<400 (n=74)	0.242*	0.153
400-799 (n=84)	0.420*	0.348*
800-1999 (n=64)	0.376*	0.234*
2000 or more (n=21)	0.549*	0.690*

* Significantly different from zero $\alpha = 0.10$

Sources: Annual tax revenue and property valuation data are from Annual Reports (1980-82) of the Division of Property Valuation and Review (DPVR), Agency of Administration, State of Vermont; housing units and median household income are from the 1980 Census; the multiyear averages, ratios, and statistics were compiled by the authors.

positive (or decreasingly negative) as we proceed from the smallest to the largest communities.

Note that in each size-bracket we show a pair of correlation coefficients: a simple correlation coefficient, $r(S,T)$ and a wealth-adjusted correlation coefficient, $r(S,T/W)$. The latter is offered as added precaution that the comparisons across size-brackets are not confounded by differences in wealth.

The patterns revealed by the simple and partial correlations are quite similar. First, we observe that all correlation coefficients are positive. This result indicates that in general voters seem to express complementary demands for school and town services. Within any community size-bracket in Vermont, towns that vote higher school taxes per household also tend to vote higher town taxes per household. While these results are qualitatively similar to the findings of Sacks, they provide somewhat stronger affirmation of complementarity in voter choice. Sacks's data represent a single fiscal year, whereas our data are a composite of three consecutive years. Sacks's data are aggregated over all community-sizes; ours are disaggregated by community-size brackets.

We also can see from table 6 that $r(S,T)$ appears to be substantially higher for communities with at least 2,000 households than it is within the smaller size-brackets. Descriptively, this result is supportive of hypothesis 2, suggesting a stronger degree of complementarity in voter

choice within large communities than that which prevails within smaller communities. However, a statistical test of the differences in $r(S,T)$ across size brackets shows that overall the differences are not statistically significant (Chi-Square, $\alpha = 0.10$). Thus we cannot reject the null hypothesis that the form of relationship between S and T is independent of community-size: the greater degree of complementarity observed for the largest communities could be due to chance.

PART V. Qualifications and Extensions

When the data fail to offer substantive and statistically significant support for a hypothesis, there are two types of possible explanations. First, the hypothesis itself may be overly simplistic or simply unsound. Second, the data may be inadequate for the test. In principle, before one dismisses the hypothesis, one should investigate possible deficiencies of the data base and research design. In this regard, the analyses we have reported suffer from at least two substantive shortcomings.

First, our local-tax variables are too highly aggregated, distinguishing school taxes only from the aggregate of town taxes. Our hypotheses rest partly on the belief that the road maintenance component of town taxes is a relatively non-discretionary (wealth-insensitive) commitment. Accordingly, proper tests of the hypotheses require a further disaggregation of local town taxes between road maintenance and other

functions. While such an effort is in progress, it appears that only a minority of the Vermont communities report their annual tax assessments for road maintenance (to the DPVR) in a distinct line item. So data collection in this pursuit will be a challenging task.

Second and as noted earlier, community size and community wealth are not the only variables that are relevant to an explanation of tax choices. In our further investigations, we will incorporate data measuring the number of pupils per household in a community, the density of housing in a community, and the mix of property between residential and "business." Between-community variation in these variables should be statistically controlled when assessing the effects of differences in community size and wealth. Doing so will not necessarily lead to stronger support for our hypotheses; however, it will serve to diminish the risk that our analytical results are being confounded by the behavior of these factors.

NOTES

1. A data appendix providing individual-town figures on the measures created for the study is available from the authors on request.
2. At town meeting time voters often are told the official estimate of the grand list for the upcoming fiscal year as well as estimates of federal and state funding for local programs. Hence, adoption of a local budget proposal is tantamount to approval of the property tax rate that will have to be assessed. Moreover, since each property owner is cognizant of the assessed (or listed) value of his or her property, a tax rate can be translated readily into an estimate of the property owner's tax liability.
3. Helen F. Ladd, "Local Education Expenditures, Fiscal Capacity, and the Composition of the Property Tax Base," National Tax Journal 28, no. 2 (June 1975):152.
4. Ibid.
5. Seymour Sacks et al., "Competition between Local School and Non-school Functions for the Property Tax Base," in Property Taxation and the Finance of Education, ed. Richard W. Lindholm (University of Wisconsin Press, 1974), 176.
6. For each $P = \frac{S}{S + T}$ and the three-year average is:
 $(P_{1979} + P_{1980} + P_{1981}) / 3.$
7. The Annual Reports contain numerous omissions as well as occasionally erroneous figures. We corrected errors for approximately twenty jurisdictions, after consultation with town clerks.
8. The figure does not mean that the "average" household in a community is liable for \$600 a year in school taxes. A portion of the taxes assessed in any community is paid by business establishments, open-land owners, and vacation homeowners. We assume, however, that the "burden" of taxes assessed on all property, residential and other, is borne by the resident households. Support for this assumption is provided by Michael C. Lovell whose examination of Connecticut school districts suggests "that voters feel they carry much of the burden of the (property) tax on business property" ("Spending for Education: The Exercise of Public Choice," Review of Economics and Statistics 60 [November 1978]:91).

9. Actual school expenditures per household are approximately 40 percent higher on average and are less widely disparate than are school tax revenues per household. The excess of expenditure over local revenue reflects state and federal aid to local school districts. State aid (under the Miller Formula--in effect through FY1982) in general supplemented the revenues of the low-taxing towns to a greater extent than it supplemented the revenues of the high-taxing towns.

10. Note that a correlation coefficient between any two variables must assume a value between -1.0 (perfect negative correlation) and +1.0 (perfect positive correlation). The value 0.0 indicates no (linear) correlation at all. Values above (approximately) 0.120 are significantly different from zero at the 1 percent level of significance (George W. Snedecor and William G. Cockran, Statistical Methods, 7th ed. [Ames: Iowa State University Press, 1980], table a-11, p. 477).

11. Michael J. Munson, "Residential Property Tax Burden in Chittenden County" (Mimeo, December 1981).

12. From table 1, the correlation $r(S,H) = 0.151$, which is not significantly different from zero, while $r(T,H) = 0.417$ which is significantly above zero.

13. Walter McMahon, "A Broader Measure and Wealth and Effort for Educational Equity and Tax Equity," Journal of Education Finance 4 (Summer 1978):65-88.

14. "Holding community-size constant" really means "within a given size-bracket." Although size still varies among communities within a given size-bracket, this variability is severely restricted, and thus much less likely to confound behavioral relationships with wealth.

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LIST OF PUBLICATIONS

Occasional Papers Series

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Occasional Paper No. Three, "Goal Setting in Planning: Myths and Realities," by Robert L. Larson, 41 pp., 1980. Discusses and evaluates "rational planning models" for goal setting in educational systems with particular emphasis upon the Vermont application of these models.

Occasional Paper No. Four, "Research and Lawmakers: A Student Perspective," edited by Barry Salussolia and David Rider, 66 pp., 1981. Incorporates edited transcripts of seminars among legislators and policy analysts exploring the interaction of research and policy making, especially legislation, presented during a Center-sponsored UVM course, "Applied Research on Vermont Topics"; includes a bibliography.

Occasional Paper No. Five, "Social Service in Vermont: The Community and the State," by Marshall True, 27 pp., 1981. Contains two papers: "Insanity, Society and the State: Some Perspectives on Mental Health in Vermont" examines attitudes and treatment of insanity and mental health problems in Vermont; "From Relief Society to Mental Health Center: The Changing Role of the Howard in Burlington, Vermont" traces the evolution of voluntary neighborhood charities into highly specialized and institutionalized public agencies.

Occasional Paper No. Six, "The French in Vermont: Some Current Views," by Peter Woolfson and Andre J. Senecal, 39 pp., 1983. Contains two papers: Woolfson's "The Franco-Americans of Northern Vermont: Cultural Factors for Consideration by Health and Social Services Providers" examines some of the general cultural patterns of Franco-Americans and seeks to assist health and social services practitioners, in particular, to better understand clients who share this heritage; Senecal's "Studies on Vermont/Quebec Relations: The State of the Art," a bibliographical essay, surveys a wide range of works treating Vermont/Quebec relations from a number of different perspectives and disciplines.

Occasional Paper No. Seven, "From Ferment to Fatigue? 1870-1900: A New Look at the Neglected Winter of Vermont," by H. Nicholas Muller, III, 24 pp., 1984. Examines Vermont's history in the post-Civil War era and assesses the historiography of the period, finding its emphasis on decline incompatible with recent evidence; concludes by calling upon researchers to develop greater understanding of a neglected period in Vermont's past.

Catalogue:

University of Vermont Bailey/Howe Library Folklore and Oral History Catalogue, 58 pp., 1981. Provides descriptive listings and shelf numbers for five collections housed in the UVM Archives of Folklore and Oral History: College of Medicine, Institutional, Political, Vermont Landscape Artists, and Folklore; includes index to Folklore Collection.

Conference Proceedings:

Focus: Vermont 1975, edited by George B. Bryan, 21 pp., 1975. Presents papers delivered at a March 22, 1975 conference sponsored by the Center on such diverse subjects as music in Vermont, Vermont in maps, and the Vermont Data Bank; concludes with a plea to publish so that Vermonters might become more conscious of their heritage.

Data Collection: Individual Rights to Privacy Versus Public Program Needs, edited by D. Gregory Sanford, Mary B. Deming, and Frederick E. Schmidt, 55 pp., 1977. Summarizes addresses and remarks delivered at a November 6, 1976 conference sponsored by the Center and funded in part by a grant from the Vermont Council on the Humanities and Public Issues, and the UVM College of Arts and Sciences.

Vermont's Heritage: A Working Conference for Teachers--Plans, Proposals, and Needs, edited by Marshall True, Mary Woodruff, and Kristin Peterson-Ishaq, 127 pp., 1983. Incorporates scholars' presentations and curricular projects developed by participants at a July 8-10, 1983 conference partially supported by a matching grant from the Vermont Council on the Humanities and Public Issues.

Supplement:

"University of Vermont Graduate College Theses on Vermont Topics in Arts and Sciences," 30 pp., 1982, supplement to Occasional Paper No. One; provides abstracts of theses on Vermont topics in arts and sciences completed between Spring 1978 and Fall 1982.

