

THE COSTS OF VOTING: EVIDENCE FROM A NATURAL EXPERIMENT

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ABSTRACT: *This paper uses the consolidation of polling places in Los Angeles County during the October 2003 gubernatorial recall election to study the costs of voting. The consolidation afforded an opportunity to observe a natural experiment: those whose polling places were changed in the consolidation should be statistically comparable to those whose polling places are not changed. Thus, we may observe both groups' turnout rates and ascribe any differences to the treatment of the change in polling locus. We find evidence that changing polling place locations does decrease turnout overall by a substantial 1.5 percentage points; a drop in polling place turnout of 3.3 percentage points is offset by an increase in absentee voting of 1.8 percentage points.*

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Almost 50 years ago, Anthony Downs introduced the critical insight that the act of voting has costs, and that when the costs get sufficiently high enough, it is rational for a voter to abstain (Downs 1957). In theory, the cost need be barely greater than non-zero to justify abstention, so low is the probability that one's single vote will affect the outcome of the election and thus produce a benefit. In practice, of course, people do vote, demonstrating that the act of participation is not only an exercise in self interest, but also involves aspects of altruism, civic-mindedness, and expressiveness, thus justifying the personal cost in time, transportation, and inconvenience incurred (Riker & Ordeshook 1973; Green & Shapiro 1994).

However, these higher-minded motivations are not universally sufficient to overcome the costs of voting for all people; while turnout rates are very variable, they never approach 100% in any election of consequence. So, costs do matter to voter turnout. The challenge then is to identify these costs and quantify them, in order to build the best model we can of those factors affecting voter turnout and participation more generally.

The biggest variables in participation involve traits of individual voters which affect costs or perceived costs of voting, such as political interest or education (Campbell, Converse, Miller, & Stokes 1960; Miller & Shanks 1995). However, accessibility issues and convenience factors have been shown to have significant effects (Rosenstone & Wolfinger 1978, Wolfinger & Rosenstone 1980; Squire, Wolfinger, & Glass 1987; Rosenstone & Hansen 1993; Knack 1995; Highton 1997; Stein 1998).

In recent work, Gimpel & Schuknecht (2003) investigated the specific question of whether the difficulty of reaching one's polling place, in terms of distance and impedance

(i.e., the time and effort of the commute). They determined in a 2000 general election study of three suburban Maryland counties that ease of access is positively related to turnout, though the relationship is non-linear and moderated by other factors.

The historic California gubernatorial recall election of 2003 provides an opportunity to study voter turnout and the costs of voting in what amounts to a unique natural experiment. The almost surreal event, governed by a dusty, century-old constitutional clause and covered by a blanket of international media, created major problems for county election officials who had not budgeted for the unexpected recall election. In seeking to cut costs, some counties consolidated voting precincts. Consolidation was possible because of the unique ballot for the Recall election. In a typical election there are scores of different ballots in a county, based on overlapping lines of different types of governmental units for which elections are being held. This makes it hard to consolidate precincts without risking having multiple ballots in the same precinct – a confusing practice at best. In the Recall, however, there were only four, statewide, questions on the ballot, the two part recall question and two initiatives. The first recall question was whether the sitting governor should be recalled, and the second was who, from a list of candidates, should replace him. The only ballot difference across areas was the need to randomize the order of candidates in each of eighty Assembly districts. Consequently, precinct consolidation was both feasible and a reasonable response to budgetary strictures.

Not every county consolidated precincts. In fact, most did not. Despite the cost factor, county administrators were loath to risk the possibility of a decline in voter turnout – and an increase in voter complaints – bound to occur given changes in long-

established polling places and a decrease in the density of the polling places offered. There are two conspicuous ways that voter turnout could be decreased by a decrease in the polling places. First, new polling places could be less accessible to some voters because they are farther away, a “transportation effect”. Second, new polling places require that the voter know that the polling place has changed, know how to get to the new location, and be undeterred by lack of knowledge about a new neighborhood. Problems related to these issues can be called a “disruption effect”. County election administrations have as one of their primary goals the maximization of voter turnout. Since consolidation could at least theoretically lead to a less than maximal turnout, most shied away from it.

A few counties, however, consolidated precincts. Los Angeles County, the biggest county in California and in the United States, reduced the number of distinct voting precincts from almost 5000 to about 1800. This process in Los Angeles County created what we hoped would be a natural experiment with a large number of observations. We hoped that whether or not someone’s polling place was the same or different between 2002 and 2003 would be completely uncorrelated with those characteristics that affect one's predisposition to vote. If this were true, then we could compare two groups, alike in every way, except that one group has had its "cost of voting" increased by the change in polling place, forcing the registrant to assimilate and cope with new information and challenges that the other group need not.

Although the consolidation is not a perfect natural experiment, it is about as close as we normally come with observational data. Consequently, it provides us with a very strong inference that consolidation in Los Angeles County reduced turnout by a

substantial 1.50% in the 70% of the precincts in which the polling location was changed. We also find that voting at the polling place decreases even more, by 3.27% but that an increase of absentee voting of 1.77% makes up for some of this reduction. In addition, we find that the substitution of absentee voting for a reduction in polling place voting is greatest among middle age and older people whereas younger people are more inclined simply not vote at all.

Theory

What Precinct Consolidation Does -- The consolidation of voting precincts consists of three distinct changes. First, for most people whose polling places are changed, the new polling place will be farther away than the old polling place. Hence, there will be additional *transportation costs* for most people. There are also two kinds of *disruption* effects. One is the increased *informational and search costs* associated with finding the new polling place. The other is that the new polling place will typically be in a different neighborhood than the old one, and this neighborhood will usually differ from it in many respects. On average, it seems just as likely that the new neighborhood will be better (more safe, easier to get around, more pleasant to be in, etc.) rather than worse than the old one, but uncertain and risk-averse voters will weigh the costs more heavily than the benefits. Hence, on average, there will be increased *risk aversion costs*.

Our research program involves trying to disentangle these costs by getting information on each of them. Informational and search costs can be proxied by whether or not the polling place location was changed. Transportation costs can be proxied by geo-coding the original 2002 and the new 2003 polling place locations and calculating

the increased distance from voters. Finally, risk aversion costs can be proxied by getting census data (and perhaps crime data) on the characteristics of the neighborhood of the polling places. The first measure, whether or not the polling place was changed, is relatively easy to get, and we have it for this paper. The second measure, distances to the old and new polling places, have already been calculated for some polling places but are not complete. We are still working on collecting neighborhood characteristics.

For the purposes of this paper, we are just using a variable indicating whether or not polling place location was changed. When used alone, this variable will capture the average effects of all the processes described above, and it will allow us to answer the major question confronting those election officials who want to consolidate districts which is whether or not there will be any significant decline in turnout. If there is a significant decline, then one policy response is for election officials to forego precinct consolidation. Another would be to encourage absentee ballots. But it would be useful to know what combination of additional informational and search costs, transportation costs, and risk-aversion costs caused the decline because each of these factors has different policy implications. If the problem is informational, then voters might be better informed about how to get to their new polling location. If the problem is transportation costs, then precinct consolidation might be undertaken to minimize the increase in the distance people must travel, some programs might be instituted to help people get to the polls (especially if the transportation costs seem to fall especially heavily on some portions of the population), and absentee voting might be encouraged. Finally, if the problem is risk aversion costs, then care might be taken to choose new polling places in good neighborhoods or if this is infeasible (due to distance considerations, for example),

in “safe haven” sites in bad ones; also, voters might be given better information about the neighborhood in which the new polling place is located. Absentee voting might also be encouraged.

The Outcomes of Precinct Consolidation -- Turnout, the fraction of people who vote either at the polling place or by absentee ballot, is obviously an important outcome variable for this study, but it is not the only possible outcome measure. There are three possible outcomes for each voter, voting at polling places, absentee voting, and not voting, and turnout is the sum of the first two of them. To clarify what we expect from precinct consolidation, we consider each outcome represented by a letter with a value of one if the voter chooses that outcome and zero otherwise. Thus, the voter can vote at the polling place on election-day (represented by p), the voter can vote via absentee ballot (a), or the voter can decide not to vote at all (n). Probably the most important policy question is the impact of consolidation on voting turnout (t) which consists of voting at the polling place or via absentee ballot ($t = p + a$). Obviously the sum of either turning out (t) or not turning out (n) must be unity because one or the other act must occur. Hence, $t+n = 1$. With this identity and the definition of turnout, any two of the measures p , a , and n provide a full description of a voter’s behavior.

If we represent the costs of voting at the polling place by c_p (these costs consist of the sum of c_i --information and search costs, c_t --transportation costs, and c_r --risk aversion costs) and the costs of voting absentee by c_a and if we represent the benefits of voting by b , then the voter will get net benefits $b-c_p$ by voting at the polling place, net benefits $b-c_a$

by voting absentee, and 0 by not voting at all.¹ Clearly, the person will maximize his or her welfare by voting at the polling place ($p=I$) if the net benefits of voting at the polls is greater than zero ($b-c_p > 0$) and the net benefits of voting at the polls exceed the net benefits of absentee voting ($b-c_p > b-c_a$). The person will vote absentee if the net benefits of absentee voting are positive ($b-c_p > 0$) and the net benefits of absentee voting are greater than the net benefits of voting at the polls, ($b-c_a > b-c_p$). And finally the person will not vote if the (zero) net benefits of not voting are greater than the net benefits of voting at the polls ($0 > b - c_p$) and the net benefits of voting absentee ($0 > b - c_a$)

For each voter in the population, we allow b , c_p , and c_a to have different values by assuming that each is a random variable and that they have a trivariate probability distribution. Then the proportion of people voting at the polls, for example, is equal to the following, where we have used capital letters to represent proportions:

$$P = \text{Prob}(p=I) = \text{Prob}(b-c_p > b-c_a \text{ and } b-c_p > 0) = \text{Prob}(c_a > c_p \text{ and } b > c_p).$$

And similarly for the proportion of people voting absentee:

$$A = \text{Prob}(a=I) = \text{Prob}(b-c_a > b-c_p \text{ and } b-c_a > 0) = \text{Prob}(c_p > c_a \text{ and } b > c_a).$$

And for the proportion of people not voting:

$$N = \text{Prob}(n=I) = \text{Prob}(0 > b - c_p \text{ and } 0 > b - c_a) = \text{Prob}(c_p > b \text{ and } c_a > b).$$

Figure 1 presents a graphical depiction of these formulas. Suppose we plot net benefits from polling place voting ($b-c_p$) versus net benefits from absentee voting ($b-c_a$). Each voter will be located somewhere in this space depending upon his or her values of b , c_p , and c_a . If a third dimension were added to this picture, it could represent the density of each kind of voter. The diagonal on the figure represents the place where net benefits

¹ Thus the voter's decision problem is to maximize the expression $[(1-N)*B - (1-N)*A* C_A - (1-N)*P* C_P]$ by choosing P, A, or N.

from voting place voting equals the net benefits from absentee voting. The zero line on each axis represents the place where net benefits are zero. The non-voters, indicated by N on the picture, are in the lower left-hand quadrant where net benefits are negative for both polling place and absentee voting (where $0 > b - c_p$ and $0 > b - c_a$). The polling place voters, P , are above the diagonal ($b - c_p > b - c_a$) where the net benefits of polling place voting exceeds the net benefits of absentee voting, and they are above the zero net benefits line for polling place voting ($b - c_p > 0$). The absentee voters are below the diagonal ($b - c_a > b - c_p$) and to the right of zero net benefits for absentee voting ($b - c_p > 0$). The proportion in each of the three groups depends upon the density of voters in each area.

Now, consider what happens with precinct consolidation. Assume that all precincts are consolidated and the cost of consolidation, c_c , is the same across all precincts. For voters the cost of voting at the polling place increases from c_p to $c_p + c_c$. Then the proportions change to the following:

$$P^* = \text{Prob}(c_a > c_p + c_c \text{ and } b > c_p + c_c).$$

$$A^* = \text{Prob}(c_p + c_c > c_a \text{ and } b > c_a).$$

$$N^* = \text{Prob}(c_p + c_c > b \text{ and } c_a > b).$$

A glance at the first formula indicates that polling place voting will unequivocally decrease if c_c is greater than zero and if there are people for whom this change makes a difference because there will be fewer people for whom the benefits of voting exceed the costs of polling place voting and for whom the costs of absentee voting are greater than the costs of polling place voting. That is, some people will move from polling place voting into absentee voting and others will move from polling place voting into not

voting at all. Those who move into absentee voting will be people who always thought that the benefits of voting outweighed the costs of absentee voting but who formerly found it cheaper to vote at the polling place than through absentee ballots and who now find it better to vote absentee because of the added cost, c_c , to polling place voting. Those who move into non-voting will be those who never voted absentee (and won't now) because they calculate the costs of absentee voting to be greater than the benefits of voting, but they voted in the past because they found the benefits of voting at the polls to be greater than the costs of voting there. With the additional costs of voting at the polls, and with their long-standing belief that absentee voting costs more than the benefits of voting, they decide not to vote at all.

Figure 2 represents these changes by making shifts in two lines. First, the diagonal line in Figure 1 shifts upward by the amount c_c because the net benefits of polling place voting have decreased by that amount. Consequently, the net benefits of polling place voting will now only equal the net benefits of absentee voting for those people for whom their net benefits of polling place voting used to be c_c units bigger than the net benefits of absentee voting. Second, the horizontal "zero" line shifts upward by c_c because the net benefits of polling place voting are now greater than zero only for those people for whom the benefits used to be c units bigger than zero. The resulting picture has two areas where voters move away from polling place voting. $N^\#$ are people who no longer vote. $A^\#$ are people who turn to absentee voting. The relative size of each group will depend upon the size of c_c and the density of voters in these areas. Note that using Figures 1 and 2 we can write the proportions of each kind of voter (P^* , A^* , and N^*) in the

final situation in terms of the proportions in the original situation and those who change their behavior:

$$P^* = P - N^\# - A^\#$$

$$A^* = A + A^\#$$

$$N^* = N + N^\#$$

We can also write turnout as:

$$T^* = P^* + A^* = P + A - N^\#$$

This formula shows that the change in turnout will be the negative of the change in non-voting, and turnout will decrease less than polling place voting because some people will move away from polling place voting into absentee voting.

Empirical Results

What was Done to Get Data – Conceptually, getting the data ready for this paper was straightforward, but the sheer size of the data files and lists involved made it anything but simple. We obtained voter lists, along with their addresses and precincts, for both the 2002 (Gubernatorial and midterm election) and the 2003 recall election. We also obtained lists of polling place locations in 2002 and 2003. Matching and cleaning the files provided the bulk of the work. In the end, we have, for each voter who appears on both the 2002 and 2003 voting lists, the location of their polling place in each year, whether or not they voted in 2002, and whether or not they voted in 2003. In addition, we have other information of varying quality about people's sex, age, nationality and party registration. Appendix 1 describes the data matching project in more detail.

Initial Results – If we assume that the decision in 2003 about which polling places were changed was essentially random (an assumption about which we will have much more to say), then the precinct consolidation constitutes a natural experiment for comparing what happens with and without changes in polling places. We can use those precincts that were unchanged to get estimates of P, A, N, and T, and we can use those precincts that were changed to get estimates of P*, A*, N*, and T*. Table 1 provides these estimates. Note that there is an absolute 3.27% move away from polling place voting. But more than half of this, 1.77%, is made up by a turn to absentee ballots. Hence, the total decline in turnout is only 1.50%.

Statistical Significance -- From a substantive perspective, a decline of turnout of 1.50% is clearly significant, but is it statistically significant? At first blush, it appears that it must be because there are over three million voters in the data. In fact, if the treatment had been randomly assigned to these voters, then the 1.50% figure would be associated with a confidence interval of 1.39% to 1.62% and a t-statistic of 25.7. But the actual units that were assigned one treatment or another were actually about 12,000 “sub-precincts” with about 250 people in each unit. Hence, the standard statistical methods exaggerate the statistical significance of the result. Eventually, we intend to use hierarchical linear models to get the proper confidence interval for our results, but for the moment, we will use some other statistical tests which provide a strong confirmation of the significance of our results.

To do this, it is very useful, and instructive, to plot polling place voting, turnout, and absentee voting by age. We can do this because we have year of birth for about 87% of the voters on the file. Figure 3 plots polling place vote by treatment for ages between

20 and 90 – those for which we have large enough numbers of people to make relatively smooth plots. One simple test of any hypothesis is a sign test in which we look for the number of times that one quantity is larger than another. In this case, the average polling place voting for those with unchanged precincts is greater than the same average for those with changed precincts for every age – seventy of them. If, in fact, there is no difference between these two groups, then we would expect the two lines to cross and re-cross—in fact each would be on-top about half the time. The probability of always having the unchanged precincts line on-top for seventy different trials if the null hypothesis of no difference is correct is $(1/2)^{70} = (1024)^7 = 10^{21}$ – which is not very likely. Figure 4 does the same for turnout by age, and the result is similar although there is one place (age 23) where the “unchanged” line dips slightly below the changed line. Finally, Figure 5 provides the same kind of result. Unless there were systematic differences between the groups to begin with, it seems extraordinarily unlikely that the lower turnout, greater absentee voting, and lower polling place voting among those with changed precincts is a statistical fluke.

Changes in Voting with Age -- Figure 3 is also substantively interesting. It displays the well-known inverted U of voting which increases with age until the mid-fifties and then slowly declines to low levels by the 80's. In addition, it provides a very strong suggestion that polling place voting may have decreased more among older people than younger people. Figure 4, which displays turnout, provides additional evidence for this notion, although as we would expect, turnout decline is less than the decline in polling place voting. Finally, Figure 5 shows that absentee voting accounts for the smaller impact on turnout than polling place voting. It also provides very strong

evidence that absentee voting not only increases with age, but the impact of changing precincts is greatest among older people.

Randomization Checks

The Randomization Process -- The preceding conclusions were based upon the presumption that there were no pre-existing differences between the two groups, those with changed precincts and those without. In effect, the conclusions were based upon the presumption that this was truly a randomized experiment. In truth, it seems unlikely that this was so because of the way that precinct consolidations takes place. Clearly it makes no sense to “consolidate” precincts by randomly linking one precinct with another – the result could be the conjunction of precincts miles and miles away from one another with no common boundary. A better way to consolidate precincts is to take a group of contiguous precincts and to join them into a larger precinct. Then some polling location in a precinct near the center of agglomeration is chosen as the polling location for the consolidated precinct. Because adjoining precincts are probably similar in many ways this process amounts to “matching” or “pre-stratifying” precincts, and then choosing the polling location for the consolidated precinct from one of the matched precincts. If the polling location were chosen randomly from those available in the matched precincts, then this would be a good randomized experiment with some stratification that might substantially improve statistical efficiency. But the polling location is probably not chosen randomly, it is probably chosen to be near the middle of the matched precincts. Nevertheless, it seems likely that this amounts to a relatively random procedure for choosing polling locations. In fact, it is essentially the geographic analog of classic

random sampling procedures from lists in which a random starting place was chosen and then every tenth name was added to the sample.

One other factor, however, might diminish the randomness of this procedure. Decision-makers might have taken some characteristics of the voters into account when they consolidated precincts and chose polling place locations. If these characteristics affect turnout in a significant way, then there could be substantial differences between the voters with changed and unchanged polling locations. In the worst case scenario, a highly partisan Registrar of Voters might change polling locations for precincts with large concentrations of partisans of one particular party. This kind of machination might occur in some places (Texas and Illinois come to mind) with highly partisan County Registrars of Voters, but it seems unlikely in California with its Progressive tradition of choosing Registrars based upon their efficiency and effectiveness and not their partisan identification. It is still possible, however, that the Registrar might consider ostensibly non-political factors. The most likely, it seems to us, are those factors that have to do with the perceived mobility of voters. We would expect, for example, that decision-makers might have decided not to change polling locations for concentrations of elderly residents.

Were Polling Places Changed Randomly? -- Figure 6 explores this hypothesis and finds some confirmation for it. The percentage of unchanged precincts clearly rises with age – with the inflection point just about the time of retirement. We suspect, in fact, that the Registrar of Voters decided not to consolidate precincts in old-age homes and other places with large concentrations of elderly residents. Nevertheless, despite this clear relationship to age, the average age of those voters with changed polling locations was

46.44 years while the average age of those voters with unchanged polling locations was 46.66 years – only eighty days older. Moreover, although age is correlated with turnout, it is not clear that this difference could account for the results we found earlier.

Perhaps of more importance is any difference in partisan makeup. Table 2 shows that the percentage of changed and unchanged polling places was practically identical across Democrats, Republicans, and those with other party registrations (including no identification with any party). The biggest difference is only 0.32% which is very tiny.

Pre-Existing Differences in Voting -- Clearly of most importance is whether or not there were any pre-existing differences in turnout across the two kinds of areas. Table 3 presents data on this from 2002 in the same format as those in Table 1. If there was true randomization, then there should be no significant differences in the bottom row of Table 3. In fact, there were some pre-existing differences in voting, but they were entirely confined to absentee voting and polling place voting – absentee voting was 0.65% higher among those precincts that changed and 0.60% lower among those that were unchanged. These differences are small, but they might explain some of the results in the bottom line of Table 1. In a later section, we adjust for these differences.

Further Tests of Randomization – Figures 7, 8, and 9 are analogs of figures 3, 4, and 5 except for 2002 data. If randomization were perfect, we would not expect to see any significant differences on these graphs between those people with changed and with unchanged polling locations. In fact, there are clearly some significant differences among older people on Figures 7 and 9. Figure 8 for turnout presents the pattern we were hoping to find throughout – the two lines cross and re-cross one another. Each line is on top of the other just about as often as the other one. These results suggest that

randomization was pretty good with respect to turnout, but it was not so good with respect to absentee voting. It seems likely, in fact, that decisions to refrain from consolidating precincts with high proportions of older people created pre-existing differences between the two treatment groups for absentee voting and polling place voting.

Difference in Difference Results

Overall Results – One way to correct the original results in Table 1 for pre-existing differences found in Table 3 is to take “difference-in-differences” that adjust the 2003 differences by the 2002 differences. The next-to-the-last row of Table 3 includes the 2003 differences and the last row presents the difference-in-difference estimates. The major change from this adjustment is that the decline in polling place voting is somewhat less and the increase in absentee voting is somewhat less, but the decrease in turnout is actually slightly greater. These adjustments do not change the fundamental results.

Results by Age -- Figures 10, 11, 12 are analogs of Figures 3, 4, and 5 but with adjustments for 2002 behavior by taking the difference between each outcome variable in 2003 and its value in 2002 and plotting the average by age for each treatment group. These figures provide further evidence for not only the substantive significance of these differences, but their statistical significance as well because the lines virtually never cross. In addition, they provide more tests of the notion that older people were affected in a different way than younger people by changing polling locations. Unlike the earlier results in Figures 3, 4, and 5 where there were differences across all three outcome measures, the only measure for which there is a clear-cut relationship with age is

absentee voting. Table 4, which presents difference-in-difference estimators by age groups, confirms this result. The only obvious pattern on this table is that changing polling locations produces increasing absentee ballot rates as people get older. In fact, roughly speaking, the percentage of absentee voters increases by about one-third of a percent (.33%) for each ten years of age.

Conclusions

The preceding only provides a taste of what is possible with this dataset. From a technical perspective, future work involves calculating standard errors correctly, doing more randomization checks, and making even more sophisticated corrections. From a substantive perspective, the geo-coding of the addresses and adding neighborhood level data will make it possible to disentangle the reasons for why people are discouraged from voting when their precinct polling place is changed. It should also make it possible to estimate a cost function for voters. Although there is much more work to be done, this paper, we believe, clearly shows that precinct consolidation decreases voting turnout by a significant 1.5%.

Appendix 1

All the data acquired came from the Los Angeles County Registrar-Recorder/County Clerk. The voter data were obtained routinely; the polling place data less so. Individual-level voter data includes a voter's name, registration precinct, residential address, mailing address, phone, party registration, sex, birth date, birth place, date of registration, date of last transaction, permanent absentee voter status, and turnout records (in person voting, absentee voting, or abstention), along with several fields of identifying information and miscellaneous other data. Some of these data are incomplete; for example, dates and places of birth are missing in many cases, and sex is missing more often than not, although it can be inferred from the title field (Mr., Mrs., Miss) as well in some cases. However, the critical data of name, precinct, address, and turnout are always present.

The Registrar only maintains official records of polling places in hard copy. These records include polling place precincts, polling place addresses, and a description of the polling place (residence, business, church, school, etc). While 2003 turned out to be available electronically via a stroke of luck, 2002 had to be scanned in using OCR software, and then reviewed line-by-line for correctness. We are grateful for the assistance of several colleagues at UC DATA and the Survey Research Center in executing this technically challenging and labor intensive task, including Ilona Einowski, Jon Stiles, Eva Seto, Lyn Civitello, and Virginia Nee.

We then had to match each voter to their polling place for both 2002 and 2003. This was a challenge, because the precincts reported for the voters were at a different level of precision than those reported for the polling place. Voters were associated with

their registration precincts. Polling places were associated with their polling place precinct, which is composed of one or more (often many more) registration precincts. We needed to acquire “crosswalk” data to merge the two files so that each voter could be associated with a polling place precinct and its corresponding address. We obtained these data from both the Los Angeles County Registrar itself and from Karin McDonald of the Statewide Database at the Institute of Governmental Studies; we are grateful to both.

Having created complete files for 2002 and 2003, the final step was to match voters from the two years and look at voting behavior changes between 2002 and 2003, contingent upon whether one’s polling place was moved or not. We used the unique identifier Voter ID to match voters from both years; approximately 3% were not matched, probably because of normal churning (residential moving, mortality, etc.) in the electorate.

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TABLE 1
Voting in Los Angeles County in 2003

	<i>Polling Place (P)</i>	<i>Absentee Voting (A)</i>	<i>Turnout (T)</i>	<i>No Vote (N)</i>
<i>Changed Precincts</i>	929,169 44.066%	320,992 15.223%	1,250,161 59.289%	854,904 40.544%
<i>Unchanged Precincts</i>	499,135 47.339%	141,858 13.454%	640,993 60.793%	411,644 39.041%
<i>Percentage Difference</i>	-3.27%	1.77%	-1.50%	1.50%

TABLE 2
Partisan Differences in Precincts (2002)

	<i>Democratic</i>	<i>Republican</i>	<i>Other/No party affiliation</i>
<i>Changed Precincts</i>	52.562%	28.098%	19.341%
<i>Unchanged Precincts</i>	52.241%	28.204%	19.555%
<i>Percentage Difference</i>	0.321%	-0.106%	-0.214%

TABLE 3
Voting in Los Angeles County in 2002

	<i>Polling Place (P)</i>	<i>Absentee Voting (A)</i>	<i>Turnout (T)</i>	<i>No Vote (N)</i>
<i>Changed Precincts</i>	929,169 44.066%	320,992 15.223%	1,250,161 59.289%	854,904 40.544%
<i>Unchanged Precincts</i>	499,135 47.339%	141,858 13.454%	640,993 60.793%	411,644 39.041%
<i>Percentage Difference in 2002</i>	-0.60%	0.65%	0.05%	-0.05%
<i>Percentage Difference in 2003</i>	-3.27%	1.77%	-1.50%	1.50%
<i>Difference in Difference</i>	-2.67%	1.12%	-1.55%	1.55%

TABLE 4
Difference in Difference Estimates by Age Group

<i>Age Group</i>	<i>Polling Place (P)</i>	<i>Absentee Voting (A)</i>	<i>Turnout (T)</i>	<i>No Vote (N)</i>
18-29	-1.85%	0.38%	-1.48%	1.48%
30-39	-2.54%	0.70%	-1.84%	1.84%
40-49	-3.03%	0.80%	-2.23%	2.23%
50-59	-2.63%	1.19%	-1.44%	1.44%
60-69	-2.96%	1.59%	-1.38%	1.38%
70-90	-3.67%	2.09%	-1.57%	1.57%

FIGURE 1
Voter Decision Making

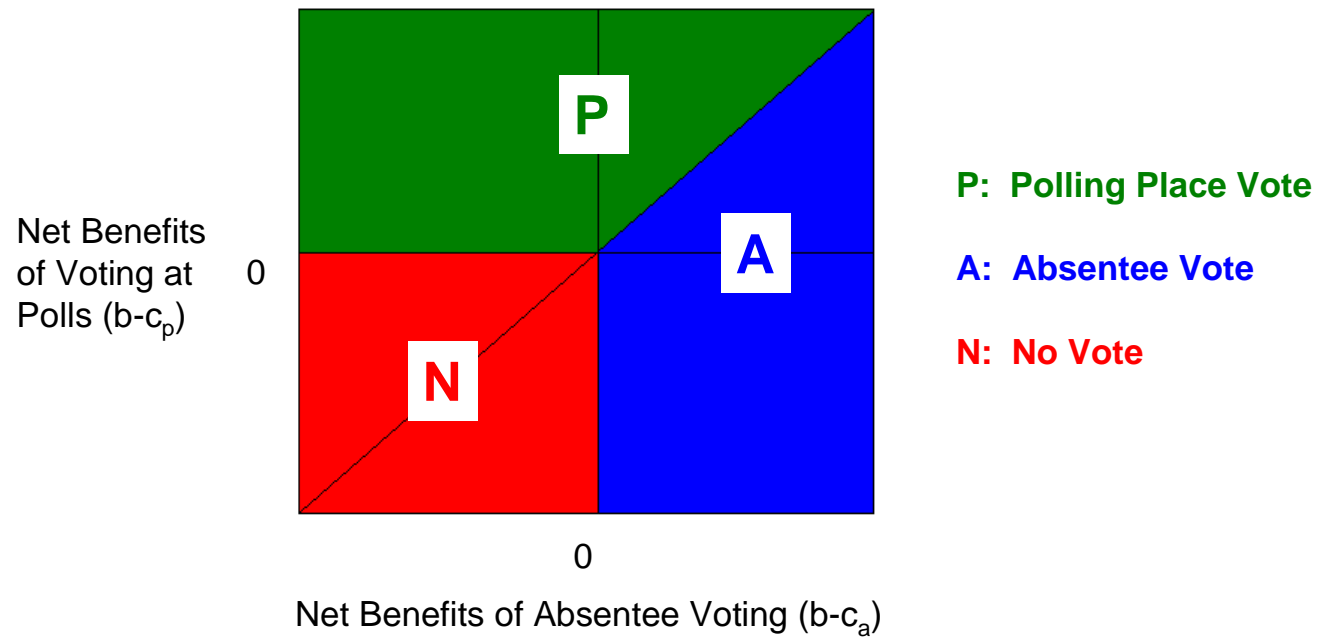


FIGURE 2
 Voter Decision Making With Shift in
 Cost of Polling Place Voting

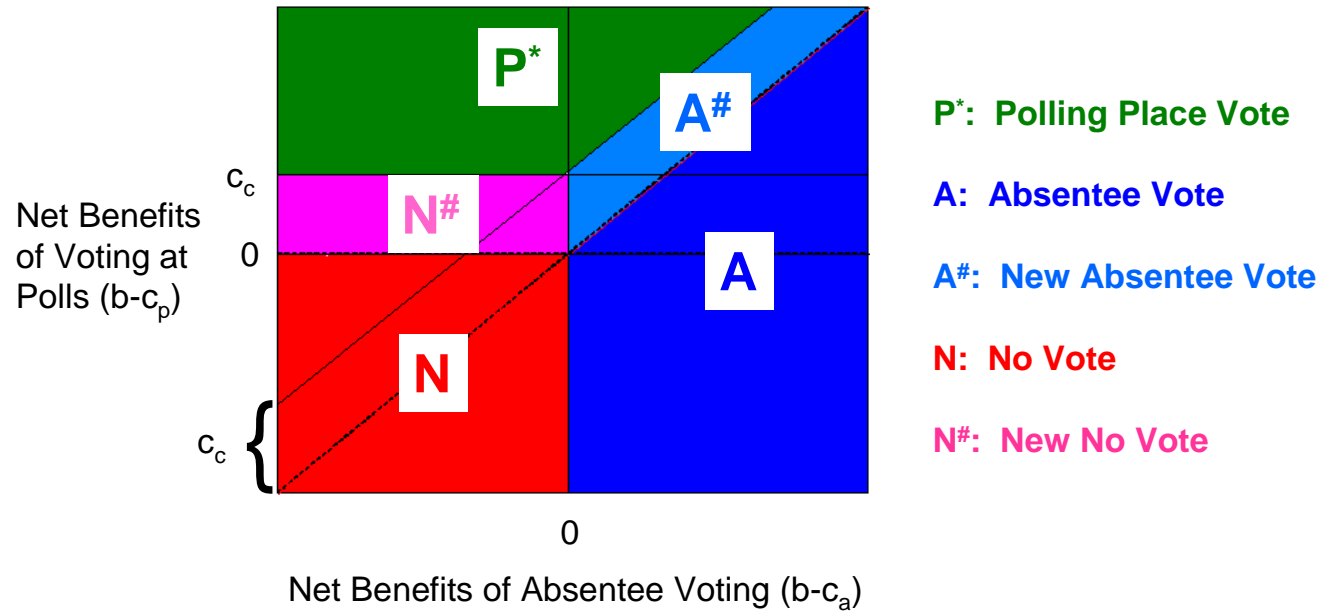


Figure 3: Polling Place Vote by Age by Treatment for 2003

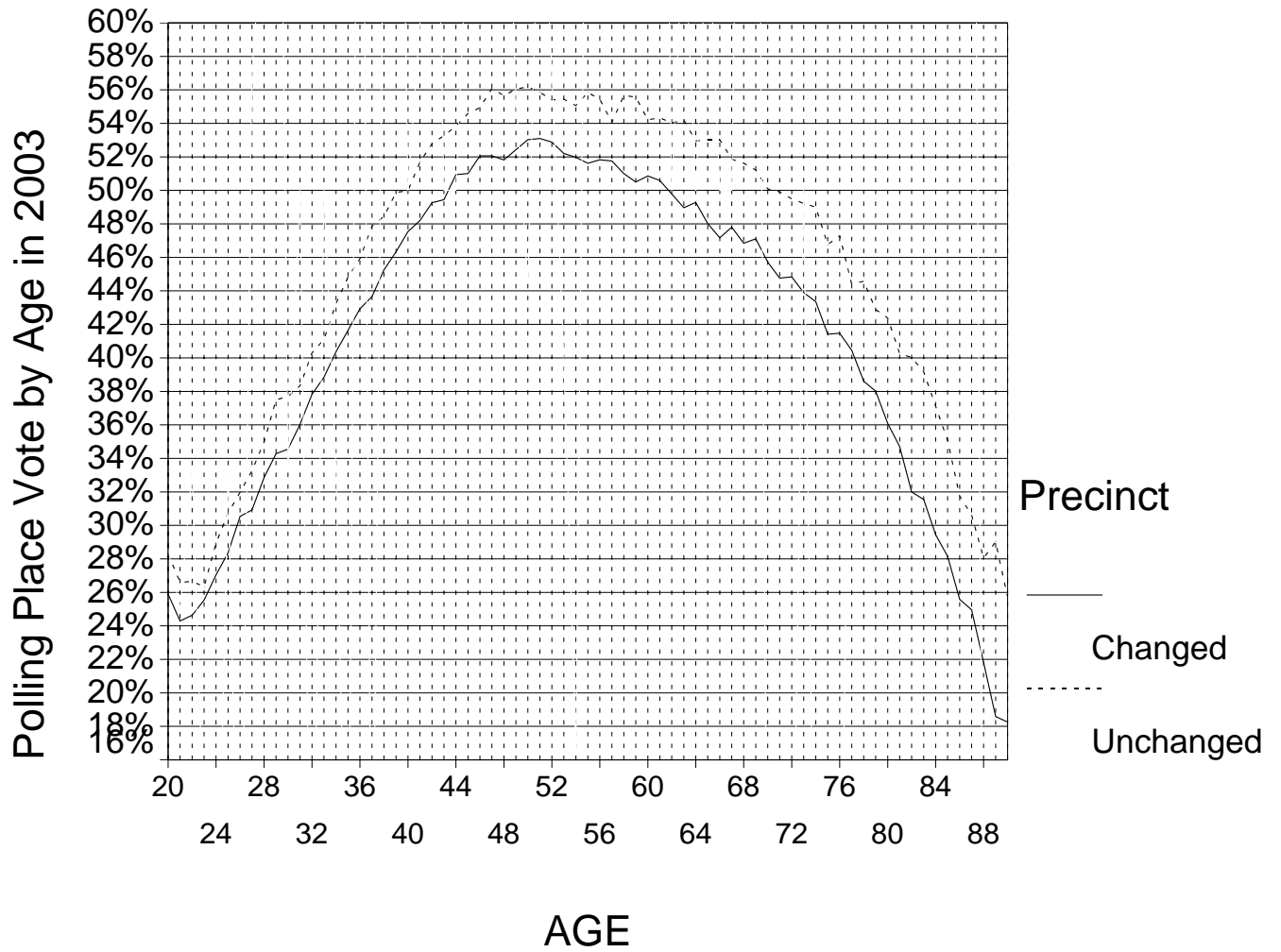


Figure 4: Turnout by Age by Treatment for 2003

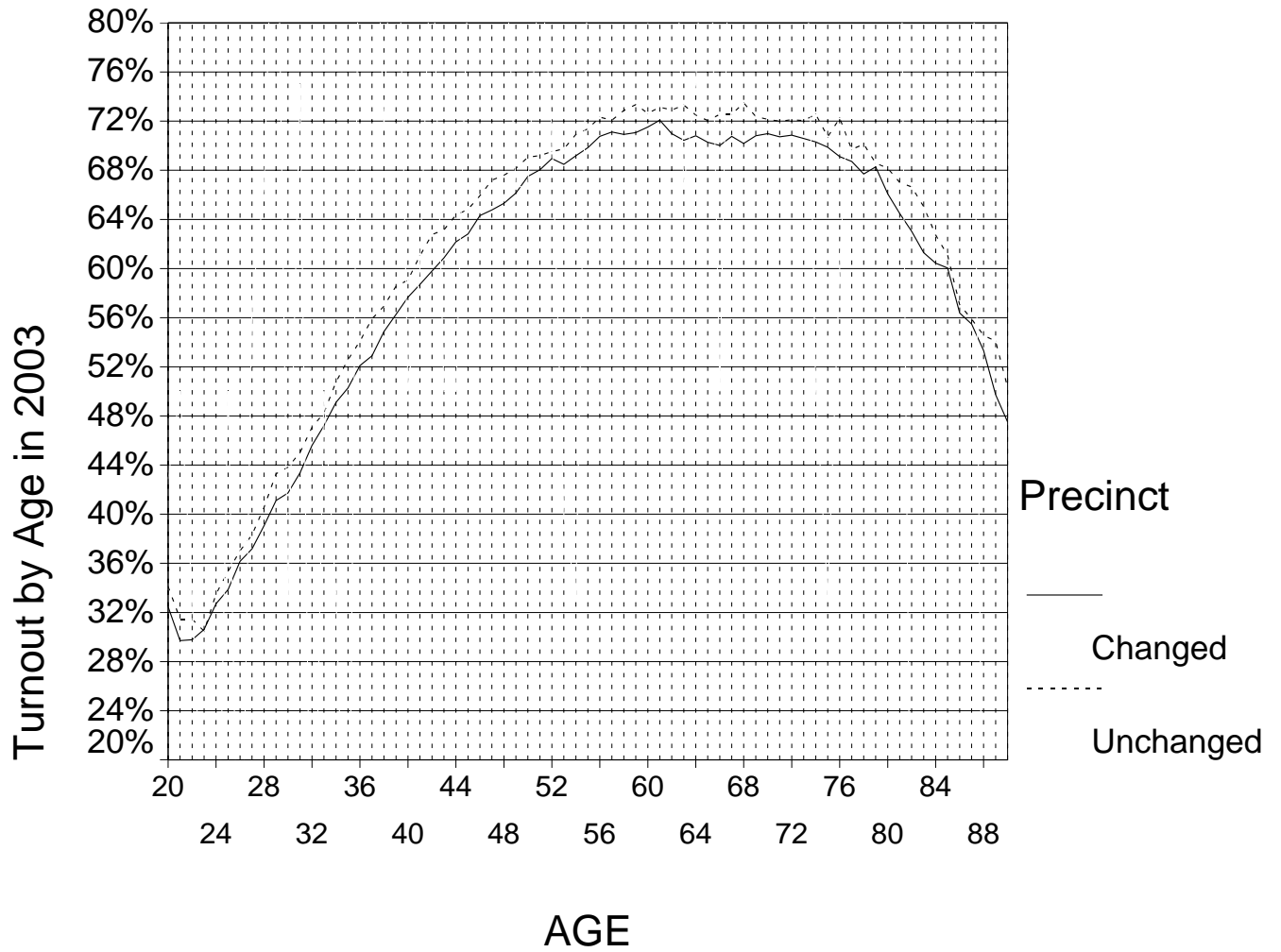


Figure 5: Absentee Vote by Age by Treatment for 2003

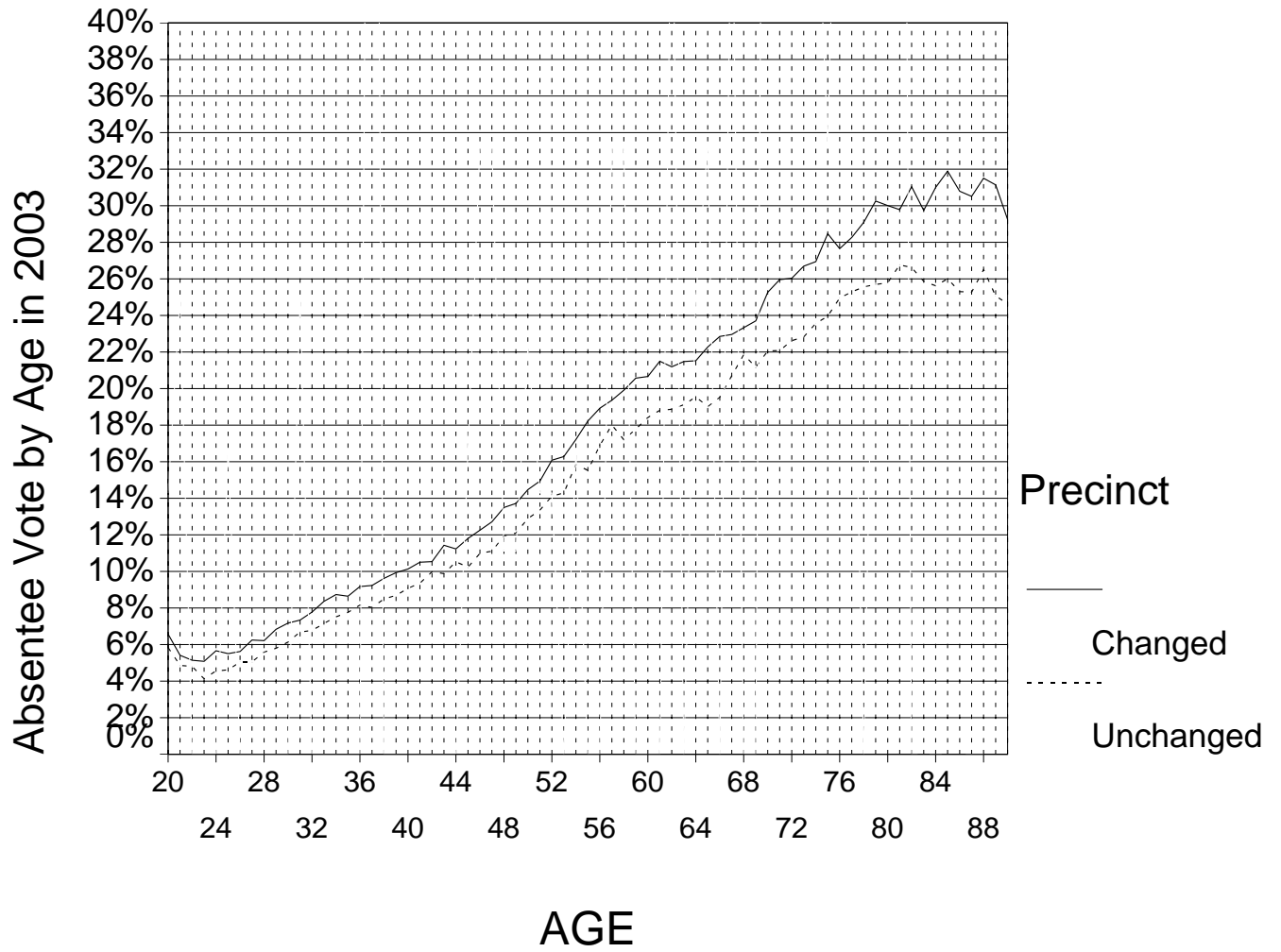


Figure 6: Percent Unchanged Precinct by Age

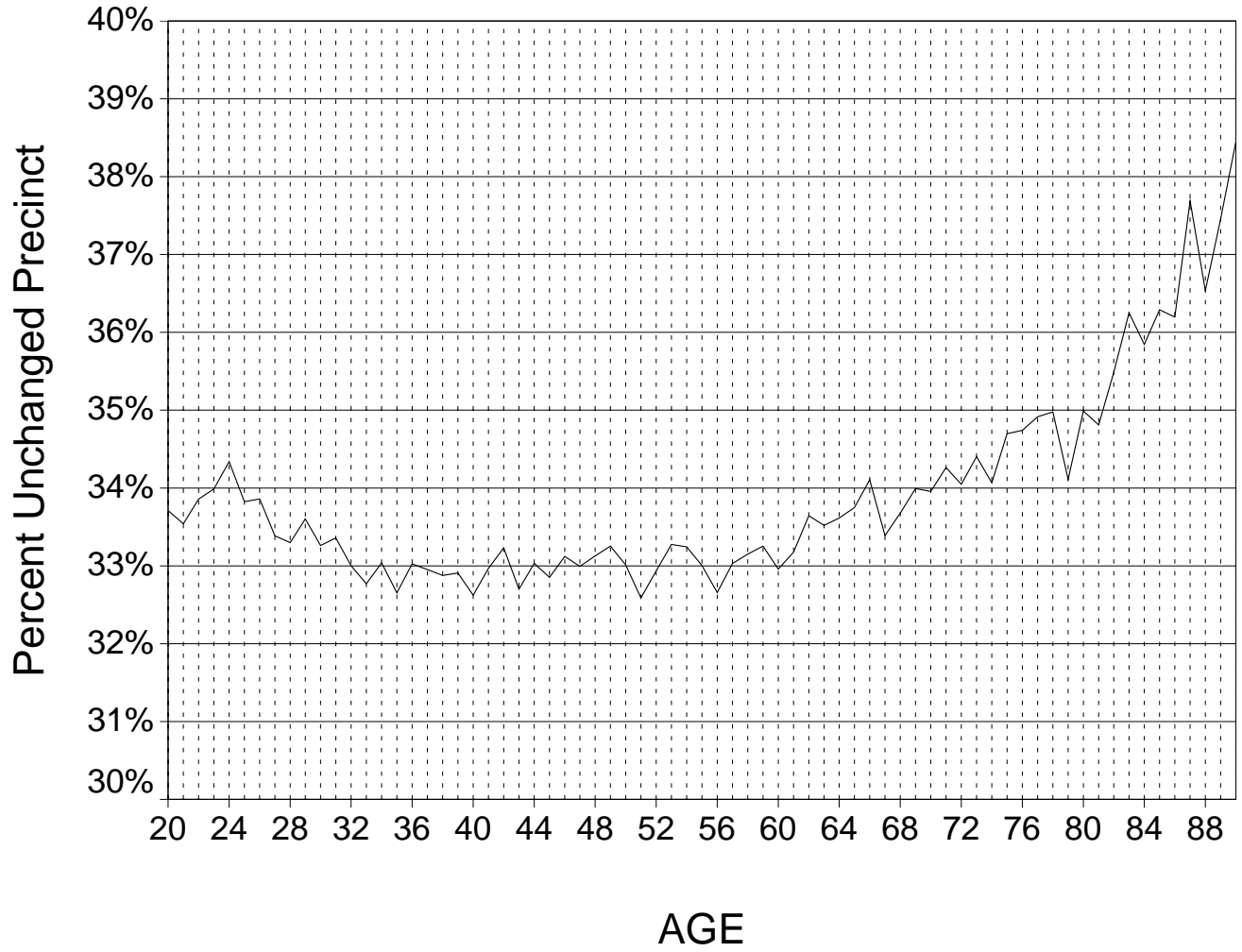


Figure 7: Polling Place Vote by Age by Treatment for 2002

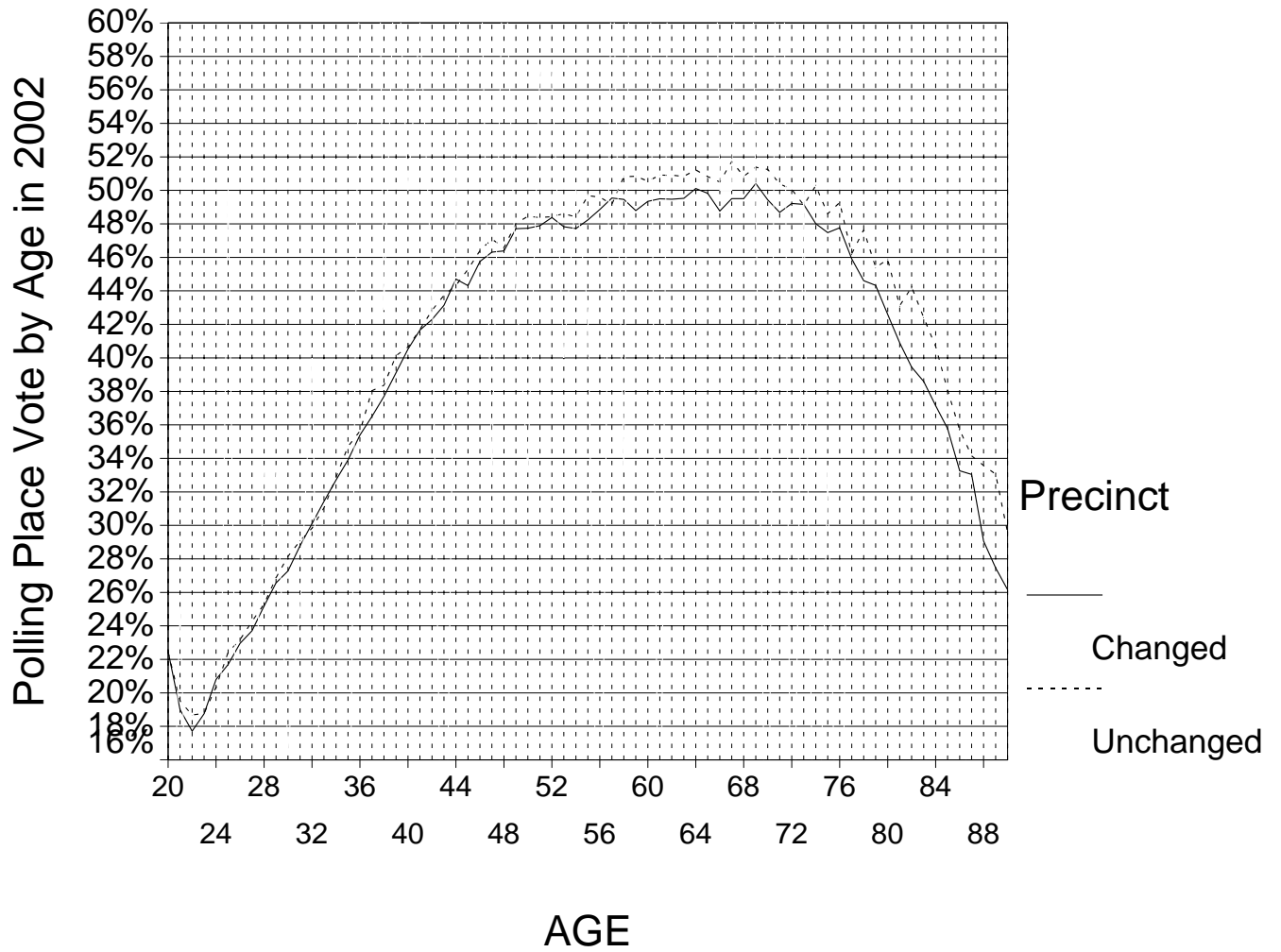


Figure 8: Turnout by Age by Treatment for 2022

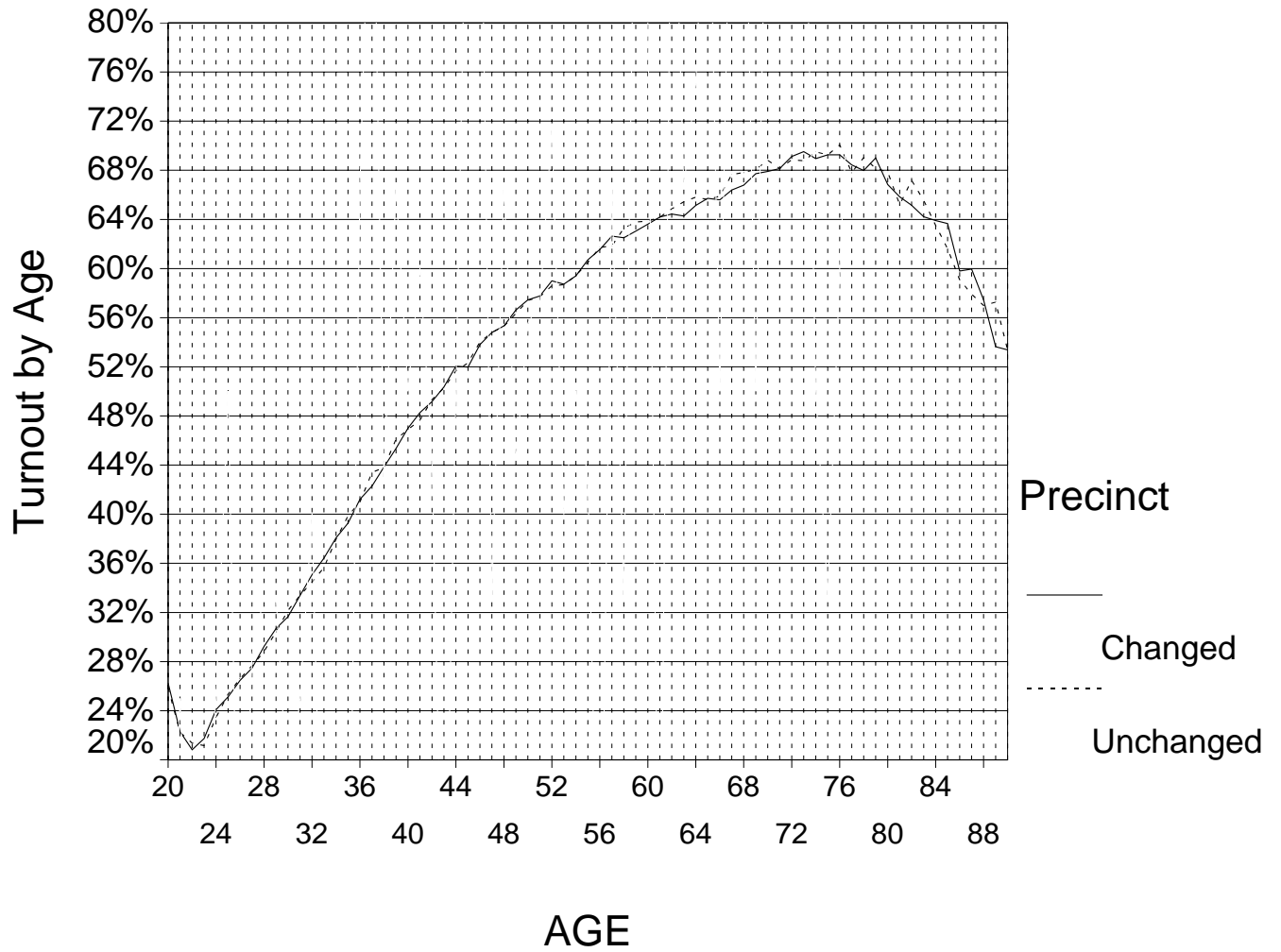


Figure 9: Absentee Vote by Age by Treatment for 2002

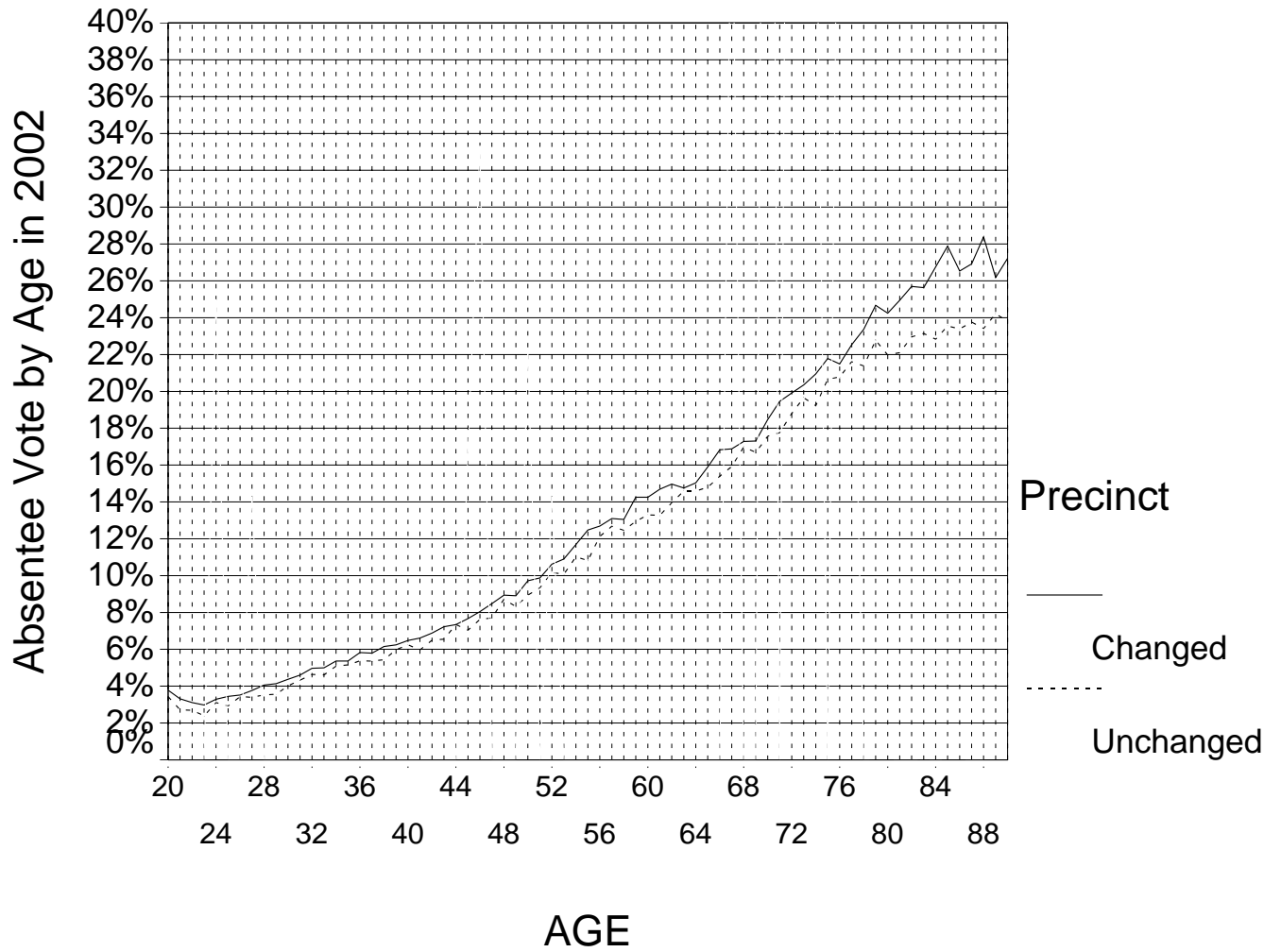


Figure 10: Polling Place Vote 2003 Minus 2002 by Treatment by Age

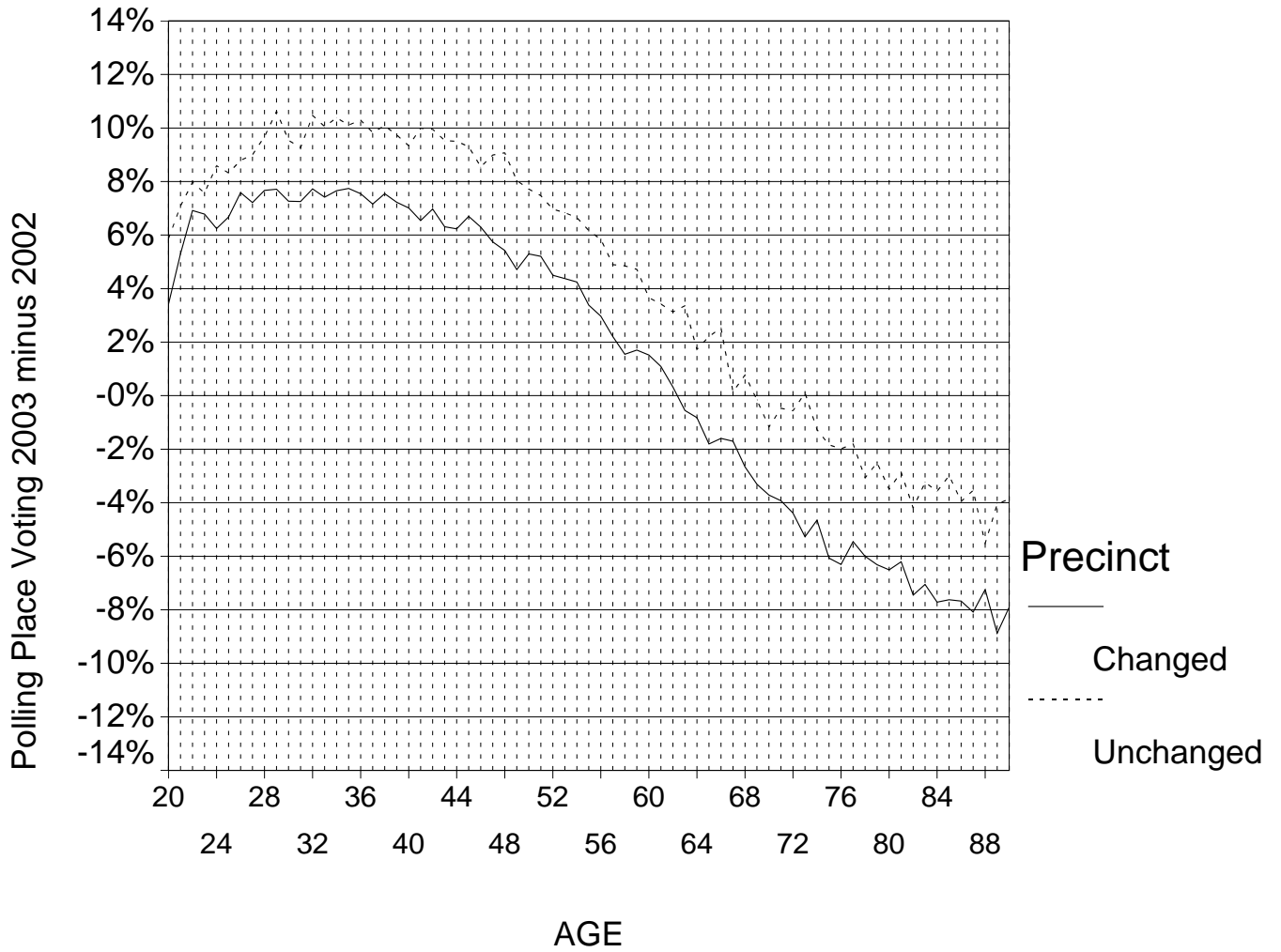


Figure 11: Turnout 2003 Minus 2002 by Treatment by Age

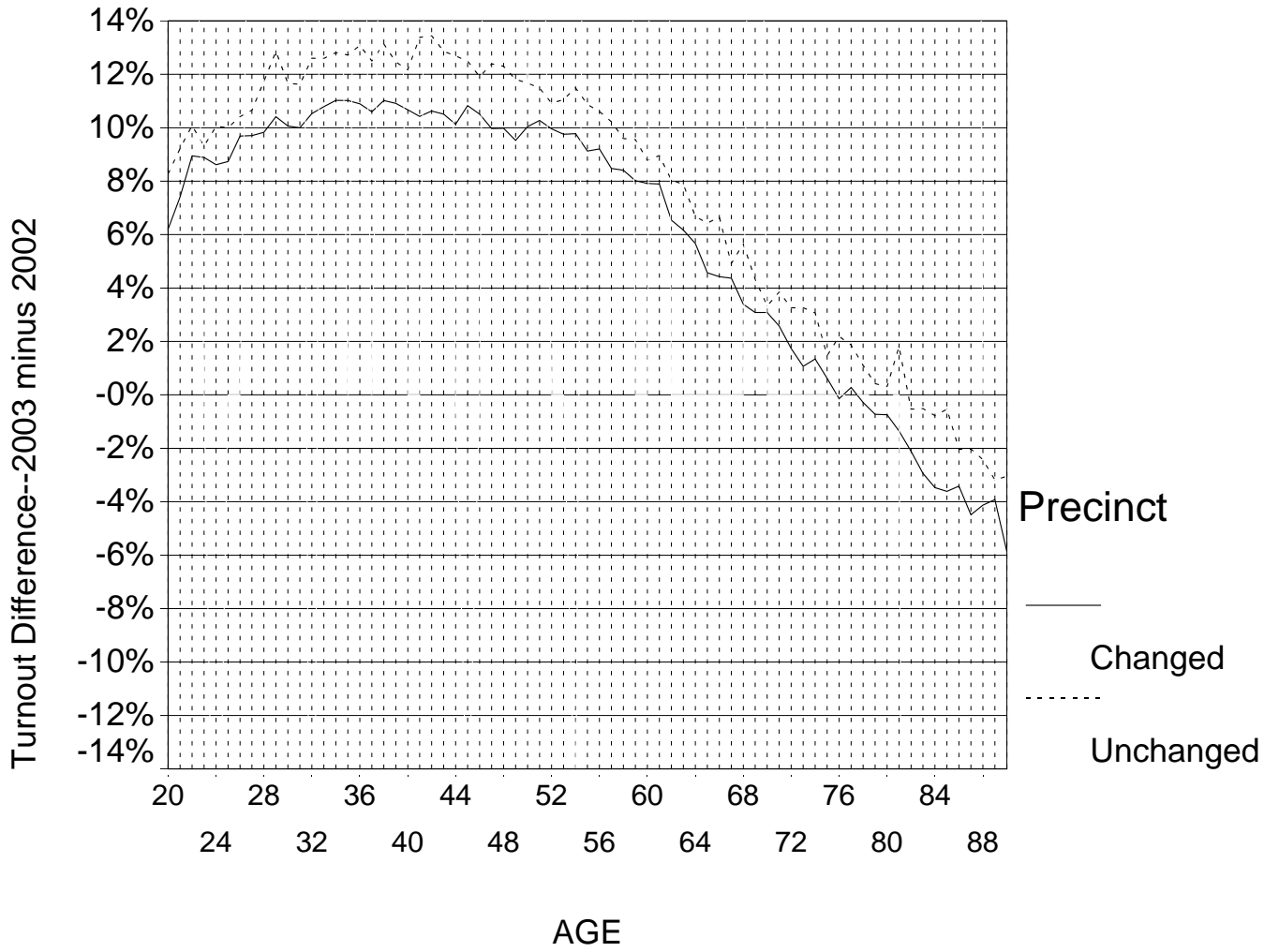


Figure 12: Absentee Voting 2003 Minus 2002 by Treatment by Age

