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1. Introduction[1]

Questions concerning vote recall are widely used in survey-based research on voting behavior. While short-term recall questions are a device to capture vote choice in post-election surveys, long-term recall questions concern voting behavior in elections months or years before. This paper focuses on the latter instrument which serves several purposes in political science. Many studies of vote switching draw on information gleaned from recall questions (e.g., Dalton et al. 2000; Trystan et al. 2003; Anderson and Mendes 2005; Hobolt et al. 2009). Moreover, data on vote recall are also used to create weighing factors that aim at correcting for sample selection or measurement error (e.g., Rattinger and Ohr 1989; Ohr and Rattinger 1993; Curtice and Sparrow 1997).

Prior studies showed that information gleaned from recall questions is error-prone. Using panel data, scholars demonstrated that in various democracies a considerable number of respondents give incorrect answers (Weir 1975; Powers et al. 1978; van der Eijk and Niemöller 1979, 1983; Waldahl and Aardal 1982, 2000). Many respondents report current party preference rather than the party they voted for in the past. As a result, analyses of vote switching based on recall data suggest voting behavior to be more stable than it actually is (Waldahl and Aardal 1982, 2000). Recall error potentially biases also results on the determinants of vote choice and vote switching (Schoen 2003; see Bernstein et al. 2001).

Scholars addressed the sources of validity problems of recalled vote choice from different theoretical perspectives (Waldahl and Aardal 2000, 374-5). The memory perspective suggests that voters are not able to recall which party they voted for months or years before. When answering a question concerning past vote choice, respondents try to reconstruct previous behavior, e.g. by relying on heuristics like current party preference (e.g., Gigerenzer, Todd,

[1] I am grateful to the two reviewers for their very helpful comments and suggestions.

and ABC Group 1999; Joslyn 2003). Moreover, processes of motivated reasoning could lead to unconscious changes in the information stored in long-term memory (Kunda 1990; Taber and Lodge 2006). Accordingly, a respondent might retrieve information from memory that differs considerably from the one stored when she cast her vote. Finally, the consistency view implies that respondents correctly remember vote choice but they do not want to disclose it. For example, they might feel uncomfortable giving a different party than the one they currently prefer (e.g., Festinger 1957). Obviously, these arguments might interact as, for example, memory problems might be conducive to consistency effects.

Relying on these perspectives, empirical analyses of the sources of recall error addressed three sets of factors. First, factors external to the respondent include the length of the interval between subsequent panel waves and changes in the party system (Himmelweit et al. 1978, 1985; van der Eijk and Niemöller 1983; Granberg and Holmberg 1988). Since these factors are constant in a given survey, they can account for differences between surveys but not between respondents within a survey.

The second set of factors comprises rather stable voter characteristics including age, education, interest in politics, political efficacy, political knowledge, and party identification (Converse 1962; Powers et al. 1978, 386; Weir 1975; Waldahl and Aardal 1982). Findings in this literature are interpreted in terms of different models of recall error. While age is used as an indicator of the deterioration of a voter's cognitive capacity, party identification is often conceived as a factor conducive to motivated reasoning or social desirable responses. Irrespective of differences in theoretical perspectives, findings on these determinants suggest that respondents in a cross-section survey giving unreliable answers concerning prior vote choice can be identified by checking a handful of stable voter characteristics. As a result, these observations might be removed from analyses or their answers might be replaced by corrected information.

According to the third line of research, information about the process of forming party preferences is crucial to identify respondents giving incorrect answers when asked to give their prior vote choice. In this view, the clarity of prior vote choice is an important factor (van der Eijk and Niemöller 1979; 1983, 123-128). Wavering and considering different parties before an election increase the probability that a person will recollect ambiguous information when thinking about previous vote choice. Moreover, changes in party preference make inaccurate responses to recall questions substantially more likely (van der Eijk and Niemöller 1979, 1983; Waldahl and Aardal 1982, 2000). Though scholars draw on different theoretical perspectives, they agree on a general implication of this line of reasoning: false answers concerning vote recall are not confined to a subsection of the electorate defined by inert voter characteristics. Data from cross-section surveys are thus not particularly helpful in identifying those respondents who give false answers concerning vote recall.

This analysis extends on the latter line of research. More specifically, it maintains that voters who cast a split ticket are disproportionately likely to give incorrect responses when asked for prior vote choice. Relying on the memory approach, this hypothesis almost suggests itself. For one, a voter who correctly remembers that she cast one vote for Party A and one for Party B might have difficulties in determining which vote she cast for which party. For another, citizens who try to reconstruct prior behavior from vague impressions of previous vote choice might remember that they had positive feelings for different parties (see Joslyn 2003). Therefore, ticket-splitting is hypothesized to be conducive to recall error.

This hypothesis will be tested using panel data from Germany. In German federal elections voters have two votes which they can cast for different parties. The district ballot is cast for a local candidate, while the so-called second ballot, which is more important in determining the composition of parliament, is cast for a party. While up until the 1970s, in federal elections less than 10 percent split-tickets were cast, in recent elections the proportion split-tickets

increased to roughly 25 percent (Hilmer and Schleyer 2000; Namislo et al. 2006). The rise in split tickets is likely to have diminished the quality of vote recall if ticket-splitting is conducive to recall problems. Whether this effect exists will be analyzed in the remainder of this paper.

2. Data and Methodology

This paper utilizes data from three panel surveys conducted from 1998 to 2008. As Table 1 shows, initial interviews were conducted during the 1998 to 2005 German federal elections. Respondents in the 1998 and 2002 panels were re-interviewed at the subsequent election, while 2005 interviewees were asked for another interview at midterm. Like many panel surveys, these panels suffer from considerable panel attrition. While in 2002 half of the 1998 respondents were re-interviewed, the two remaining studies feature much lower re-interview rates.

– Table 1 about here –

Recall accuracy is measured by the wave-2 question whether respondents happen to remember for which party they cast their party vote in the preceding federal election. If a respondent gives the same party as in the wave 1-interview she is coded 1 while incorrect answers are coded 0. Respondents had considerable problems giving correct answers when asked for which party they had cast their second ballot. At least one third of the re-interviewed persons responded that they could not remember or gave an incorrect response (Table 2). These rates of recall error are rather high as compared to results from other

countries (Himmelweit et al. 1978; van der Eijk and Niemöller 1983; Waldahl and Aardal 2000).

The results reported in Table 2 suggest that ticket-splitters have considerably greater difficulties to answer the recall question correctly than straight-ticket voters. In the latter group, at least seven in ten respondents managed to give a correct answer. By contrast, almost two in three ticket-splitters responded erroneously when asked which party they voted for in the previous election.[2]

As the 2005-2008 data include information on the recall of both district and party votes, these data allow a further exploration of the relationship between patterns of ticket-splitting and recall accuracy. The evidence shows that 12 percent of the straight-ticket voters happened to give inaccurately a split ticket, whereas more than 50 percent of the ticket-splitters said that they had cast a straight ticket in 2005. Accordingly, recalling straight-tickets appears to be easier than remembering split tickets. Taking a closer look at the misreports given by ticket-splitters, 8 out of 72 respondents reported a straight ticket for a party they had cast neither the district nor the party vote in 2005. A majority of the remaining respondents reported a straight-ticket for the party they voted for with the district, rather than the party, vote. As in Germany major parties generally receive more district than party votes, it comes as no surprise that major parties got more recalled votes than actual votes in the 2005 election, whereas small parties tend to do worse in retrospect than at the actual election.

– Table 2 about here –

[2] Nonvoters were excluded from the analysis because they cast neither a straight nor a split ticket. Since only a tiny proportion of wave-1 respondents indicated non-voting this decision does not alter the substantive findings.

Though valuable, these analyses rest on a debatable assumption: it cannot be taken for granted that the wave-1 reports of voting behavior in general and ticket-splitting in particular are valid. Prior research demonstrated that after an election the accuracy of recall concerning vote choice drops quite quickly (e.g., Wright 1993; Atkeson 1999; Belli et al. 1999). It might also be objected that pre-election vote intentions differ from actual voting behavior (e.g., Chan and Yeung 1991; DeSart and Holbrook 2003; Callegaro and Gasperoni 2008). Although the data used in this analysis do not permit to validate responses concerning vote choice, this issue might be tackled indirectly. Prior research suggests that the validity of vote intentions and vote recalls decreases as the temporal distance to the election increases (e.g., Crespi 1988; Lau 1994). Accordingly, survey reports on ticket-splitting might become less accurate as the time lapse between an interview and the Election Day increases. Given the comparatively low rate of correctly recalled split-tickets reported in the previous paragraph, this hypothesis appears to be particularly plausible.

To address this issue, I ran logistic regressions with reported ticket-splitting as dependent variable and the temporal distance between interview and the election as predictor. In the first set of regressions, only post-election interviews were included to test whether voters forget split-tickets particularly quickly. The second set of analyses includes both pre- and post-election interviews and thus permits testing whether the lapse of time between the interview and Election Day increases the inaccuracy of voters' reports on ticket-splitting. As the results reported in Table 3 and 4 demonstrate, neither hypothesis is borne out by the evidence. While voters appear to face considerable difficulties recalling ticket-splitting over a four-year-period, within the weeks before and after an election the likelihood of reporting ticket-splitting is not correlated with the timing of interviews. Accordingly, we might conclude that measurement error in reports of ticket-splitting, though probably considerable, is not correlated with the timing of interviews.

– Table 3 and 4 about here –

So, now I turn to the analysis of the determinants of recall accuracy. The main predictor variable of recall accuracy is (reported) ticket-splitting in the previous election. It might be argued that ticket-splitting in the current election might also be conducive to inaccurate recall of prior voting behavior since it might increase the likelihood of voter confusion. To test this hypothesis, the analysis controls for current ticket-splitting. As shown in the above review, ticket-splitting is not the only potential factor of recall accuracy. To avoid interpreting spurious correlations as substantive effects this analysis controls for all individual-level variables prior studies have demonstrated to make a difference in recall accuracy. Specifically, the following control variables are included: age, education, interest in politics, internal efficacy, political knowledge, party identification, clarity of partisan preference, and change in vote choice. In addition, the timing of interviews in the previous election is included as control variable because this variable might play a role in recall accuracy after other factors are controlled for.

A methodological objection against this analysis stems from the high rates of panel attrition. It is well-known from prior research, that panelists are not a random sample out of the respondents of an initial cross-section (Kalton, Kasprzyk, and McMillen 1989; Couper 1997). Selective panel mortality might thus inhibit generalizations from panel data to the public as a whole. To address this issue, I ran Heckman probit selection models to test whether the findings on the determinants of recall accuracy are sensitive to sample selection bias. As the results presented in Table A1 in Appendix B show, the hypothesis that the outcome equation and the selection equation are independent cannot be rejected. What is more, the analyses

accounting for sample selection bias confirm the substantive findings on the role of ticket-splitting (and all other predictors) resulting from logistic regression. Thus, in the next section the results from logistic regression will be reported.

3. Results

The results reported in Table 5 show that voter characteristics do not contribute much to explaining recall accuracy. The respondent's age and education virtually do not make any difference. The effects of party identification, political knowledge, and internal efficacy do not pass conventional levels of statistical significance. Moreover, the signs on the coefficients of these predictors are not always in accordance with prior research and theory. In the 2005-to-2007/8 panel, for example, political knowledge tends to decrease, rather than increase, recall accuracy. To account for this surprising finding, we might speculate that knowledgeable voters learned which party they should have voted for in the prior election. Alternatively, it might be argued that election campaigns temporarily increase political knowledge in the electorate, thereby rendering it a less valuable indicator of politically relevant cognitive capacities and processes.

High levels of interest in politics, however, rather consistently increase recall quality by a substantive margin. Likewise, clarity of partisan preference considerably affects the quality of recall. Respondents who had a strong issue-based preference for the party they voted for are much more likely to give correct responses than citizens who did not prefer this party in terms of issues. The timing of interviews does not exhibit consistently sizable effects. The evidence suggests, however, that the likelihood of correctly recalling the 1998 vote choice in 2002

depends on the timing of the 1998 interview, with reports given near Election Day being particularly likely to be accurately recalled four years later.

– Table 5 about here –

The analysis reveals that ticket-splitting is indeed a factor detrimental to the accuracy of vote recall three or four years later, even when relevant behavioral and attitudinal variables are controlled for. The coefficients on ticket-splitting are, as expected, negatively signed and pass the 1-percent-level of statistical significance. In order to assess the substantive significance I calculated probabilities of accurate recall from the results reported in Table 5, while setting the remaining variables in the model to their mean, median, and mode, respectively. The results depicted in Figure 1 show that among voters who did not switch party preference ticket-splitting decreased the probability of correctly answering the question concerning previous voting behavior by 12 point in 2002, by 11 points in 2005, and by 25 points in 2008. When it comes to vote switchers, the negative effect of ticket-splitting on recall accuracy is even stronger. Casting a split-ticket in the previous election decreased the likelihood of correct recall by 22 points in 2002, by 26 points in 2005, and by 42 points in 2008. Leaving aside the findings from the 2002-2005 panel, the differences in probabilities are statistically significant at the 95-percent-level. Thus, it is warranted to conclude that ticket-splitting is a factor of low quality-answers to recall questions concerning prior voting behavior in Germany.

– Figure 1 about here –

At the same time, ticket-splitting is not as powerful in shaping recall quality as changes in vote choice. As the results displayed in Figure 1 indicate, in the 1998-2002 panel, among ticket-splitters vote switching decreased recall accuracy by more than 50 points, while among straight-ticket voters the negative effect is more than 40 points. These effects are considerably stronger than those exhibited by ticket-splitting. In the 2005-2008 panel survey, however, ticket-splitting rivals changes in party preference in deteriorating recall quality. This finding underscores the role of ticket-splitting in decreasing the accuracy of answers concerning previous voting behavior in Germany.[3]

Reported ticket-splitting in the election held shortly before or after the interview, by contrast, does not affect recall accuracy. Information about currently casting votes for different parties thus appears not to confuse respondents when recalling prior vote choice. As this finding holds even when ticket-splitting in the previous election is removed from the equation (not reported in tables), the evidence suggests that this information does not play any role in the processes preceding voters' responses concerning vote choice in an election held several years ago.

4. Conclusion

This analysis demonstrated that ticket-splitting is an important source of recall error in Germany. Ticket-splitting in turn is driven by election-specific factors, including strategic

[3] Additional analyses (not reported in tables) are not particularly supportive of the notion that high levels of political involvement decrease the negative impact of previous ticket-splitting on recall accuracy. Only the 2005-8 analysis provides some mildly confirming evidence. Moreover, there is no support for the hypothesis that the effect of reported ticket-splitting is moderated by the timing of the interview.

incentives and conflicting evaluations of parties and candidates, rather than by inert voter characteristics (Fiorina 1992; Born 1994; Burden 2009). As a consequence, ticket-splitters in one election are not particularly likely to cast a split-ticket in the next election.[4] Thus, information gathered in a survey is not very valuable in identifying which respondents cast split tickets in the previous election and are thus likely to give false responses to recall questions concerning prior vote choice. In this respect, ticket-splitting resembles other factors that are powerful in explaining recall accuracy. So, this analysis lends credence to the notion that recall accuracy is not a stable voter characteristic.

This result leaves us with an uncomfortable situation. Scholars utilizing data from cross-section surveys have to rely on vote recall to measure prior vote choice but they virtually do not have any information valuable in determining which responses are correct. As a result, this measurement error can hardly be corrected. This implies that employing weights gleaned from vote recall is an error-prone procedure. It is thus not very powerful in correcting for bias, or it might even increase bias. Likewise, analyses of vote-switching that build on recall data might produce biased results and lead to false conclusions. As processes of partisan dealignment and increasing volatility suggest that vote-switching should be a main focus of electoral research, this conclusion turns out to be particularly far-reaching.

Given the considerable measurement error, it is tempting to think about completely abandoning recall questions concerning prior vote choice. Before accepting this conclusion, we should take a look at the putative costs and benefits of this decision. Abandoning recall questions implies giving up analyzing vote switching – unless we have valid panel data. Though particularly valuable, panel data are neither abundant nor without their own problems. Accordingly, many scholars in the field are likely to deem this price too high. A viable

[4] In the data sets utilized in this analysis, ticket-splitting in two subsequent elections is only mildly correlated (Cramer's $V < 0.20$).

strategy thus might look somewhat different: If better data are available recall data, of course, should be avoided. In the absence of better data, however, scholars might utilize recall data – and should spend as much effort as possible on critically assessing the validity of their findings. Given real-world constraints, this strategy is likely to improve our understanding substantive issues without giving up methodological rigor.

The role of ticket-splitting in shaping recall accuracy suggests that the increase in split-tickets in recent German federal elections probably led to a decline in recall accuracy.[5] Moreover, the findings imply that electoral systems make a difference in recall accuracy. By providing voters with an opportunity to cast two or more votes, some electoral systems facilitate ticket-splitting. For one, voters who harbor conflicting evaluations of parties and candidates can express them in split tickets under two (or multiple) vote systems while in single-vote systems they cast a vote for a single candidate or party. For another, two- and multiple vote systems provide strategic incentives to cast split tickets (Fiorina 1992). Electoral systems thus do not only offer voters an opportunity to express political preferences in a more nuanced way but are also likely to affect the validity of vote recall.

Finally, this discussion suggests two avenues for future research. Aggregate-level analyses might address the role of various multiple-vote systems in shaping the rate of incorrect answers concerning vote recall. Individual-level analyses are suitable to analyze whether ticket-splitting under different electoral systems and social contexts exhibit effects on recall accuracy similar to those presented in this analysis. Since a considerable and increasing number of electoral systems provides citizens with at least two votes (e.g., Shugart and Wattenberg 2001), this line of research appears to be particularly fruitful.

[5] Assuming that cognitive involvement improves the accuracy of vote recall, the present findings suggest that ticket-splitting does not necessarily imply much more complex political information- processing than casting a straight ticket.

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Table 1: Details of the three panel surveys

	1998-2002	2002-2005	2005-2008
Time of interview and re-interview	Pre/post election (08/26/1998-11/28/1998) – pre/post election (08/04/2002-12/23/2002)	Pre/post election (08/04/2002-12/23/2002) – pre/post election (08/04/2005-11/09/2005)	Post election (09/23/2005-10/13/2005) – midterm (11/11/2007-07/24/2008)
Mode	CAPI – CAPI	CAPI – CATI	CAPI – CATI
N (wave 1 – wave 2)	3337 – 1744	3263 – 902	2540 – 623
Attrition rate (%)	48	73	75

Respondents in the initial surveys were randomly drawn from the German population eligible to vote. The 1998-2002 and the 2002-2005 data sets are available at the GESIS data archive in Cologne. The 2005-2008 is available at http://www.dgfw.info/daten.php.

Table 2: Recall accuracy by ticket-splitting (in percent)

	1998-2002	2002-2005	2005-2008
Straight-ticket	72	70	79
Split-ticket	36	36	38
Total	64	61	66

Table 3: Effect of timing of interview on (reported) ticket-splitting (post-election interviews; logistic regression)

	1998-2002	2002-05	2005-07/8
Timing of interview$_{t-1}$	0.01	0.004	-0.01
	(0.01)	(0.004)	(0.02)
Constant	-1.96**	-1.64**	-1.13**
	(0.31)	(0.17)	(0.16)
Adj. P-R² (McFadden)	-0.002	-0.002	-0.002
N	1254	1230	2021

Entries are unstandardized logit coefficiencts with robust standard errors in parentheses.

Significance levels: # $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Table 4: Effect of timing of interview on (reported) ticket-splitting (pre- and post-election interviews; logistic regression)

	1998-2002	2002-05	2005-07/8
Timing of interview$_{t-1}$	-0.0001	-0.002	--
	(0.005)	(0.002)	
(Timing of interview$_{t-1}$)^2	-0.00001	0.0001	--
	(0.0002)	(0.0001)	
Constant	-1.57**	-1.46**	--
	(0.10)	(0.09)	
Adj. P-R^2 (McFadden)	-0.003	-0.002	--
N	2319	2110	--

Entries are unstandardized logit coefficiencts with robust standard errors in parentheses.

Significance levels: # $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Table 5: Determinants of recall accuracy in three German panel studies (logistic regression)

	1998-2002	2002-05	2005-07/8
Age	0.02*	-0.03	-0.002
	(0.01)	(0.06)	(0.011)
Education – low	-0.10	0.39	-0.20
	(0.25)	(0.37)	(0.41)
Education – high	0.33	-0.08	0.08
	(0.25)	(0.36)	(0.38)
Interest in politics	1.23*	1.80*	0.99
	(0.48)	(0.70)	(0.74)
Internal efficacy	0.20	-0.94#	-0.35
	(0.40)	(0.51)	(0.65)
Political knowledge	-0.24	0.02	-0.58#
	(0.20)	(0.33)	(0.35)
Party identification	-0.17	0.47	0.30
	(0.31)	(0.43)	(0.43)
Clarity of party preference	0.85**	0.65#	1.35**
	(0.24)	(0.34)	(0.38)
Change in vote choice	-2.49**	-2.39**	-1.82**
	(0.22)	(0.31)	(0.33)
Ticket-splitting $_{t-1}$	-1.00**	-1.08**	-1.84**
	(0.27)	(0.39)	(0.36)
Ticket-splitting $_{t}$	-0.01	0.36	--

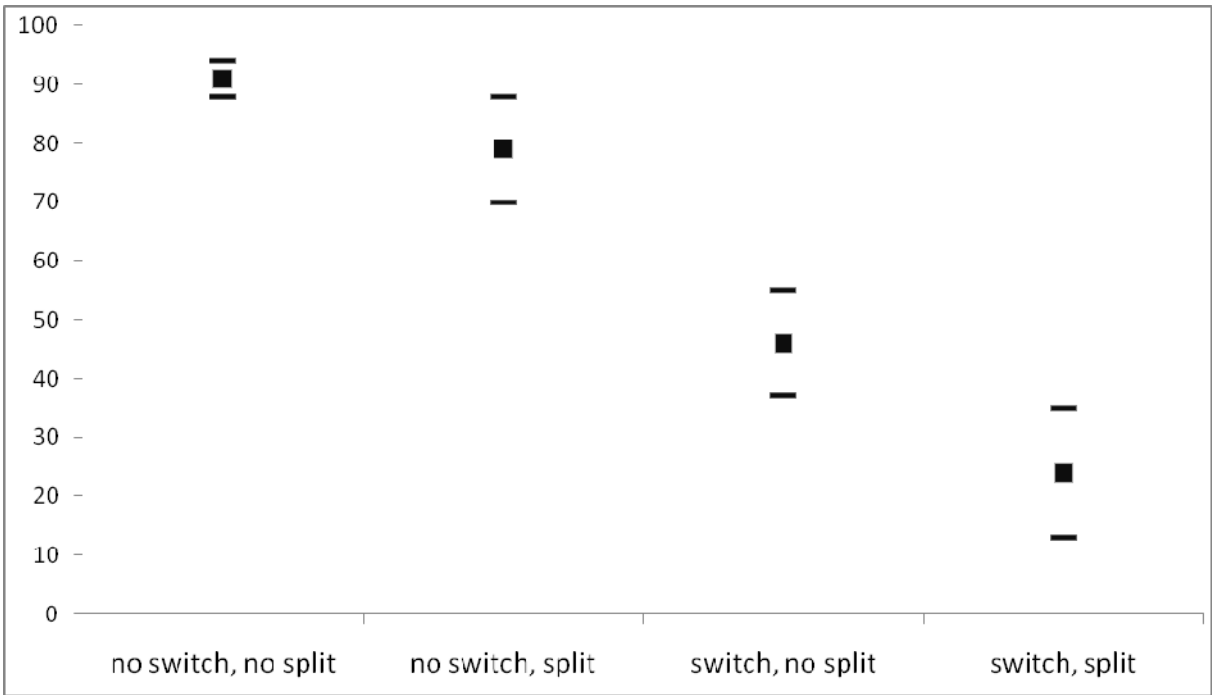
	(0.26)	(0.36)	
Timing of interview $_{t-1}$	0.01*	0.008	0.04
	(0.01)	(0.005)	(0.03)
(Timing of interview $_{t-1}$)²	-0.0004#	0.0001	--
	(0.0002)	(0.0002)	
Constant	0.47	1.01	1.25
	(0.54)	(0.78)	(0.98)
Adj. P-R² (McFadden)	0.29	0.28	0.32
N	1107	635	446

Entries are unstandardized logit coefficiencts with robust standard errors in parentheses.

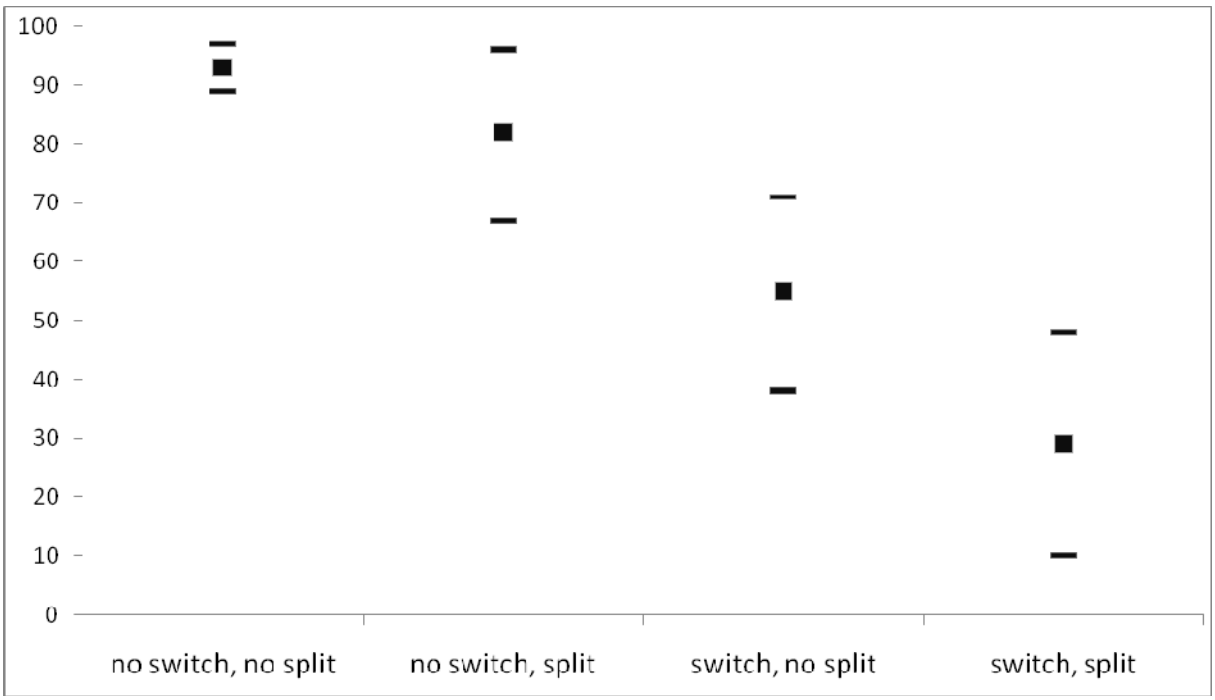
Significance levels: # p < 0.10, * p < 0.05, ** p < 0.01.

Figure 1: Recall accuracy by ticket-splitting and vote switching (in percent, with 95-percent confidence intervals)

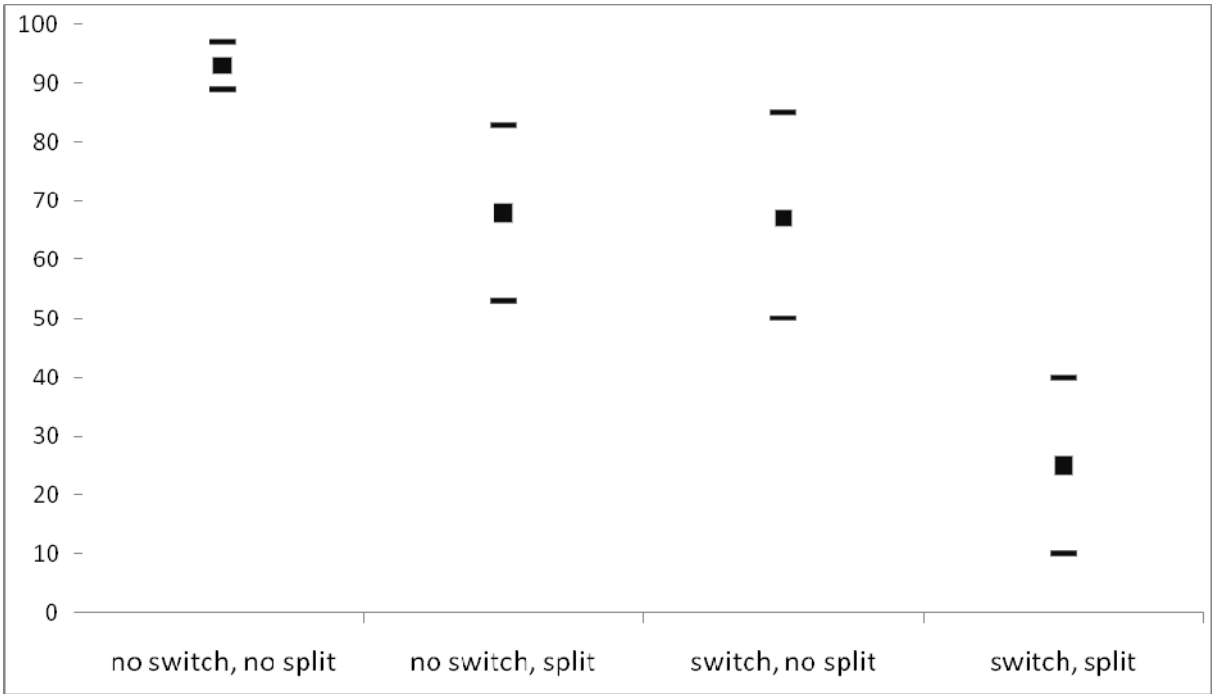
a. Panel 1998-2002



b. Panel 2002-2005



c. Panel 2005-2008



Appendix A: Indicators

Age: respondent's age in years.

Education – low: 1: primary education, 0: otherwise.

Education – high: 1: high school diploma, 0: otherwise.

Interest in politics: "How strongly are you interested in politics?" five-point scale, rescaled to 0 (not at all) – 1 (strongly interested).

Internal efficacy: 2002-2005: "Political issues are so complicated that I cannot understand them." (five-point scale), 2007/8: "Often for me it is hard to understand political issues." (seven-point scale). Re-scaled to 0 (not efficacious) – 1 (highly efficacious).

Political knowledge: "In federal elections voters have two votes. Do you happen to know which one is more important in determining the relative strengths of the parties represented in the Bundestag? Is it the first vote, the second vote, or are both votes equally important?" 1: correct answer (second vote); 0: wrong answer or don't know.

Party identification: "In the Federal Republic, many people lean towards a political party for an extended period of time although they vote for a different party now and then. How about you: Do you—generally speaking—lean towards a political party? And if so: Which party?" "How strongly do you lean towards this party?" 0: no identification; 0.5: (very) weak or medium identification; 1: (very) strong identification).

Clarity of party preference: Respondents were asked for the two most important problems and which party they consider most capable of addressing each of these issues. 0: no mention of the chosen party; 0.5: one mention of the chosen party; 1: two mentions of the chosen party.

Change in vote choice: 0: respondent gives the same party in wave 2 interview when asked for vote choice in the previous election as she gave in the wave 1 interview when asked for

current vote choice; 1: respondent gives not the same party in wave 2 interview when asked for vote choice in the previous election as she gave in the wave 1 interview when asked for current vote choice.

Ticket-splitting: 0: first and second vote, according to responses in the wave 1 interview, cast for the same party; 1: first and second vote, according to responses in the wave 1 interview, cast for different parties.

Additional variables in Heckman models

Gender: 0: male; 1: female.

Married: 1: married; 0: otherwise.

Citizen duty: "In democracy it is the citizens' duty to participate in elections." Five point-scale, rescaled to 0 (strongly disagree) – 1 (strongly agree).

Inclination to answer: "Do you want to be interviewed again at the next federal election?" (1998, 2002): 1: yes; 0: no; interviewer-rating of the respondent's inclination to answer questions; five-point scale, rescaled to 0 (not very inclined) – 1 (strongly inclined).

Appendix B

Table A1: Heckman probit selection models for recall accuracy in three panel surveys

	1998-2002	2002-05	2005-07/8
Second Stage: Recall accuracy			
Age	0.008*	-0.002	-0.001
	(0.004)	(0.005)	(0.006)
Education – low	-0.02	0.25	-0.07
	(0.15)	(0.20)	(0.23)
Education – high	0.15	-0.06	0.02
	(0.14)	(0.19)	(0.22)
Interest in politics	0.64*	0.87*	0.46
	(0.26)	(0.39)	(0.41)
Internal efficacy	0.10	-0.51#	-0.10
	(0.21)	(0.27)	(0.34)
Political knowledge	-0.20#	-0.05	-0.30
	(0.11)	(0.17)	(0.19)
Party identification	-0.07	0.24	0.16
	(0.17)	(0.23)	(0.24)
Clarity of party preference	0.46**	0.36*	0.75**

	(0.14)	(0.18)	(0.21)
Change in vote choice	-1.40**	-1.33**	-1.03**
	(0.13)	(0.18)	(0.18)
Ticket-splitting t-1	-0.56**	-0.62**	-1.06**
	(0.15)	(0.21)	(0.20)
Ticket-splitting t	-0.03	0.16	--
	(0.14)	(0.19)	
Timing of interview t-1	0.19	0.004	0.02
	(0.11)	(0.003)	(0.02)
(Timing of interview t-1)²	-0.60*	0.0001	--
	(0.29)	(0.0001)	
Constant	0.69	1.14#	0.71
	(0.37)	(0.59)	(0.99)
First stage: re-interview			
Age	-0.001	0.004#	0.005*
	(0.002)	(0.002)	(0.003)
Gender	0.07	-0.14*	0.01
	(0.06)	(0.07)	(0.08)
Education – low	-0.15	-0.07	-0.25*

	(0.08)	(0.09)	(0.11)
Education – high	-0.07	0.01	0.19#
	(0.08)	(0.09)	(0.10)
Married	0.23**	0.27**	0.05
	(0.06)	(0.07)	(0.09)
Interest in politics	0.47**	0.92**	0.92**
	(0.14)	(0.16)	(0.20)
Party identification	0.38**	0.30**	0.45**
	(0.08)	(0.10)	(0.11)
Citizen duty	0.59**	0.71**	--
	(0.13)	(0.16)	
Political knowledge	0.10	0.30**	0.13
	(0.06)	(0.07)	(0.09)
Inclination to answer	0.60**	0.56**	2.10**
	(0.08)	(0.11)	(0.59)
Constant	-1.97**	-2.98**	-4.14**
	(0.16)	(0.20)	(0.59)
ρ	-0.30	-0.30	-0.01
	(0.22)	(0.26)	(0.40)

p (test of independence)	0.20	0.28	0.98
Censored N	1607	2132	1714
N	2714	2767	2160

Entries are unstandardized probit coefficients with robust standard errors in parentheses.

Significance levels: # $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

Voter characteristics in the first-stage equation are gleaned from wave 1, in the second-stage equation from wave 2. Replacing wave 2 information by wave 1 information in the second stage equation does not alter the substantive findings.

Appendix C: Descriptive statistics

	1998-2002	2002-05	2005-07/8
Recall	0.71	0.76	0.73
Age	51.36	53.42	53.25
Education – low	0.32	0.32	0.28
Education – high	0.29	0.35	0.41
Interest in politics	0.62	0.66	0.64
Internal efficacy	0.62	0.44	0.61
Political knowledge	0.59	0.42	0.52
Party identification	0.65	0.64	0.67

Clarity of party preference	0.65	0.58	0.57
Change in vote choice	0.37	0.33	0.36
Ticket-splitting in t-1	0.18	0.21	0.27
Ticket-splitting in t	0.20	0.22	--
Timing of interview	11.06	5.78	10.35
N	1107	635	446