Title: Down But Not Yet Out: Depression, Political Efficacy, and Voting

Running Title: Depression, Political Efficacy, and Voting

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Abstract

Depression is one of the most common health problems in the developed world. Previous research has primarily investigated the relationship between depression and voting, largely overlooking its cognitive foundations. We turn to political efficacy as a key political attitude and precondition for political engagement. We build on research into the cognitive aspects of depression to construct arguments linking depression, political efficacy, and voting. Using cross-sectional (European Social Survey) and longitudinal (UK Household Longitudinal Study) data, we find evidence for a negative relationship between depression and political efficacy, that depression reduces external but not necessarily internal political efficacy, and for an accumulation effect of depression on (external) political efficacy. We also show that political efficacy is a crucial mechanism for the depression-voting gap. Our research has important implications for political representation.

Keywords: depression; health; political efficacy; political behaviour; voting

Word Count: 8,889

Depression is a leading cause of disability worldwide and, more than 300 million people suffer from this disorder (WHO, 2018). Furthermore, it is projected to become the world's most burdensome disease in the coming decades (Lépine & Briley, 2011). Hence, depression is proved to have consequences for people's daily life, including politics.

Scholarly attention to depression and political engagement has increased recently, indicating a negative effect of depression on voting. This finding has been replicated across Western democracies (Ojeda, 2015; Ojeda & Pacheco, 2019; Ojeda & Slaughter, 2019; Landwehr & Ojeda, 2020). Although this research has primarily focused on the symptoms of depression and has targeted motivation and resources as primary explanations for the voting gap, we still know little about these mechanisms.

Being associated with pessimism and low self-efficacy, depression is likely to dampen not only a general sense of efficacy but also, by extension, a more specific sense of internal political efficacy (Landwehr & Ojeda, 2020); i.e., the feeling of being able to make sense of politics (Craig et al., 1990). Yet, we know from scholarly consensus that *internal* efficacy is only one of the two dimensions of political efficacy; the other being the perceived governmental responsiveness, namely *external* political efficacy (Morrell, 2003). Although internal political efficacy has been identified as a plausible mechanism for the depression-voting gap, research remains silent on external political efficacy and lacks an empirical test for the mediation of this two-dimensional concept on the depression-voting relationship.

We propose that both types of political efficacy could be mechanisms linking depression and voting. As a major predictor of political participation (Almond & Verba, 1963; Finkel, 1985; Vecchione and Caprara, 2009), political efficacy refers to citizens' belief that, by taking action, they themselves can influence the democratic politics (Campbell et al., 1954, p. 187; Abramson & Aldrich, 1982; Levy, 2013). According to the resource theory of political participation (Verba & Nie, 1972), personal characteristics, such as time, social

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contacts and civic skills, make voting and other forms of participation easier and, therefore, increase turnout. Similarly, efficacy can be seen as a cognitive resource that lowers the threshold for participation; those who feel able and motivated to influence politics are also more likely to engage (Smets & van Ham, 2013). Efficacy makes politics seem more understandable and approachable, which facilitates participation.

We theorise about the links between depression and voting and between depression and political efficacy, the latter only recently receiving scholarly attention in health and political behaviour studies (Shore et al., 2019; Reher, 2020). Following previous research, we expect a negative effect of depression on voting. Further, we expect depression to have a negative effect on both internal and external political efficacy and that this effect is stronger when experiencing multiple depressive episodes. Then, we argue that both internal and external efficacy mediate the depression-voting relationship.

Our study combines cross-sectional data from the European Social Survey (ESS) and panel data from the UK Household Longitudinal Study (UKHLS). The cross-national data enable us to study if the potential link between depression and efficacy is found in countries while the panel data add a temporal perspective to our analysis.

We contribute to existing research in several ways. Firstly, although the impact of health on political participation has been reasonably well studied, specific health problems and the cognitive foundations of political behaviour have received less attention (see Mattila et al., 2017). Moreover, research on depression and political attitudes remains limited. Extant studies only focus on political orientations (Bernardi, 2020) and attitudes to change in referendums (Bernardi & Johns, 2021).

Secondly, by using the UKHLS data we can measure depression both as self-rated symptoms and self-reported diagnosis, which provides a more robust test for the effect of depression on political attitudes.

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Thirdly, to the best of our knowledge, we are first to test (albeit imperfectly) for an accumulation effect of depression on political attitudes. Our data do not allow us to analyse the effect of depression at different moments of its cycle. Yet we can reveal something about whether experiencing more than one episode has a different effect, compared to exhibiting only one. This is important because chronic depression can be more debilitating for political participation.

Fourthly, by exploring the mediation effect of political efficacy we advance the explanation of the depression-voting gap by showing that it is external and not internal efficacy that drives depressed people's non-voting decisions. Hence, we identify perceptions of government responsiveness as important objects of intervention for political actors to target, in order to improve depressed individuals' sense of representation.

How Depression Negatively Influences Voting

The first step of our theoretical framework is based on the relationship between depression and voting. Previous research has argued for and empirically substantiated a negative effect of depression on voting. For example, Sund et al. (2017) showed, based on hospital discharge diagnoses, data on reimbursements for depression drugs and validated turnout data, that persons diagnosed with depression are less likely to vote than others. Similar findings have been reported using self-reported symptoms (Landwehr & Ojeda, 2020). Scholars have argued that symptoms of depression, including anhedonia, sadness, hopelessness and lack of energy, would explain why depressed people are less motivated and lack physical and mental resources to participate in politics. Since these arguments have already received scholarly attention, below we present arguments for our second step, the one between depression and political efficacy, which has instead been largely neglected in previous research.

How Depression Negatively Influences Political Efficacy

Political efficacy, as a psychological determinant of political behaviour, is crucial for understanding political participation. According to Pateman's (1970) influential account, efficacy is a necessary condition for democratic participation and the two virtuously reinforce each other. Though partly genetically inherited (Klemmensen et al., 2012), most studies suggest that political efficacy develops through political socialisation, and that it can be boosted through learning and discussing politics during adolescence and early adulthood (e.g., Morrell, 2005; Kenski & Stroud, 2006).

Political efficacy has its roots in the psychological concepts of self-efficacy (e.g., Bandura et al., 1999; Bono & Judge, 2003) and locus of control (e.g., Renshon, 1974). Self-efficacy refers to a subjective feeling of ability in any domain, while locus of control is the sense of being in control of one's own life rather than feeling powerless in the face of external forces (Levy, 2013). In political science, there is widespread scholarly consensus over the two-dimensional nature of political efficacy. After considerable theoretical development and empirical testing, scholars now consider political efficacy to consist of *internal efficacy*, which refers to citizens' perceptions of their own ability "to understand and to participate effectively in politics" (Craig et al., 1990, p. 290) and *external efficacy*, which refers to perceptions of how responsive political institutions and actors are in reacting to citizens' demands (e.g., Balch, 1974; Morrell, 2003; see also Niemi et al., 1991). In the following sections, we consider the impact of depression on political efficacies in more detail.

Depression and Internal Political Efficacy

Cognitive models of depression are crucial in understanding of how depression affects political efficacy. First, Beck's seminal schema theory (1976; but see Joormann 2009, p. 300) postulates that life stressors activate dysfunctional schemas, which lead individuals to filter

stimuli in such a way that their attention is directed towards information which is congruent with these dysfunctional schemas. Such schemas include themes of loss, separation, failure, worthlessness and rejection. When dysfunctional schemas are activated in depression, a person's thoughts automatically start to revolve around pessimistic views about the self, the world and the future – Beck's cognitive triad. These negative thoughts and biases initiate and maintain depressed mood through a vicious cycle of increasingly negative thinking.

Second, the helplessness/hopelessness model of depression (Abramson, Seligman & Teasdale, 1978; Abramson, Metalsky & Alloy, 1989) is based on Seligman's concept of learned helplessness, which states that expectations of a lack of control over events lead to depressive symptoms (Joorman, 2009). Hopelessness can be defined as the expectation that highly desired outcomes will not occur or that highly aversive outcomes are certain. Thus, hopelessness is the consequence of attributing negative life events to stable and global causes. Attributing these events to internal causes leads to lowered self-esteem and feelings of worthlessness, which further strengthens the symptoms of depression.

Third, response styles theory has related negative automatic thoughts to rumination (Nolen-Hoeksema, 1991), which involves an overall sense of certainty that situations in one's life are uncontrollable (Nolen-Hoeksema et al., 2008). As a maladaptive coping strategy involving repetitive thinking, rumination saps depressed "people's motivation and initiative" and leads them to believe that "they lack the efficacy and wherewithal to engage in constructive behavior" (Nolen-Hoeksema et al., 2008, p. 403). Numerous studies have reported associations among dysfunctional attitudes, attributional styles and other negative cognitions in persons with depression (for reviews, see Joorman, 2009; LeMoult & Gotlib, 2019).

Hence, there are many reasons why depression can negatively affect internal political efficacy: lack of motivation, social isolation and withdrawal (Pietromarco & Rook, 1987),

low self-esteem (Maciejewski et al., 2000), feelings of hopelessness and mistrust of positive emotions (Paulus & Yu, 2012). Furthermore, people with depression tend to believe that future outcomes are uncontrollable and are more likely to make negative self-evaluations, attribute failure internally and be pessimistic about the consequences of actions (Coyne & Gotlib, 1983, p. 495). Additionally, mental illness stigma might reinforce this effect, as individuals with depression are likely to internalise stigma and experience significant decrements in self-efficacy as a result (Link & Phelan, 2001; Corrigan et al., 2011).

Depression and External Political Efficacy

Some of the arguments developed above may also apply to external political efficacy. Beck's cognitive triad involves pessimistic views not only about the self but also about the world. Similarly, the helplessness/hopelessness model suggests that feelings of lack of control are projected onto the outside world beyond the self, such as the realm of politics. Depressed persons' pessimistic evaluations, lack of motivation, anhedonia and mistrust of positive emotions can negatively affect the way these individuals perceive politicians' responsiveness to their concerns. Additionally, research into decision-making in depression suggests important links between depression and external efficacy.

Decision-theoretic approaches from computational neuroscience (Huys et al., 2015) propose that depression is related to underestimating the benefits of change due to biases in priors. Likewise, portfolio theories (Leahy, 1997, 2001) argue that depressed individuals take a risk-averse strategy to minimise loss, actively attempting to resist change. Depressed persons may weigh risks more heavily in their decisions. Indeed, evidence of higher risk aversion in depressed people was found in a study on attitudes to change in the context of the EU Referendum in the UK (Bernardi & Johns, 2021). If politics is about change and expected

to improve people's living conditions, then the resistance to change bias in depressed individuals might translate into negative perceptions of political system responsiveness.

Research on the cognitive aspects of depression has demonstrated negativity biases in multiple cognitive domains including attention, memory and interpretation (see LeMoult & Gotlib, 2019). Depressive mood is related to negative thoughts, selective attention to negative stimuli, and negative memories (Mathews & MacLeod, 2005). Therefore, self-referential processing may also affect the way in which depressed people perceive political information and evaluate politics more broadly. If depressed people are negatively biased in the way they attend to, recall and process political information, we can expect depression to reduce external political efficacy.

However, some research suggests that depressed individuals perceive the world in a realistic and not in a biased way (Alloy and Abramson, 1979). Studies report that people with mild depression are more likely to engage in a piecemeal style of social information processing (e.g., Edwards & Weary, 1993; Gleitcher & Weary, 1991) and that people in negative moods engage in more systematic processing than people in positive moods do (e.g., Forgas, 1998; Schwarz, 2002). Whether depressed people tend to perceive the world more negatively or more realistically would nevertheless point our argument in the same direction, suggesting a negative effect of depression on external political efficacy.

Accumulation Effect of Depression

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), the essential features of a major depressive episode include depressed mood or markedly diminished interest or pleasure in all or most activities most of the day or nearly every day for at least two weeks as well as the presence of other four symptoms (American Psychiatric

Association, 2013).[1] The probability of experiencing subsequent depressive episodes increases with each episode (Kessing, 1998; Solomon et al., 2000), and 50%-85% of individuals with depression experience multiple repeat episodes throughout their lifespan (Coyne, Pepper & Flynn, 1999), with more than 75% likely to relapse within 2 years of recovery.

Closely monitoring the phases of major depression to disentangle relapse (the person goes on to have a subsequent episode after a remission) from recurrence (the person fully recovers and suffers a subsequent episode) is not straightforward (Dobson & Dozois, 2008). However, literature suggests that relapse into or recurrence of a depressive episode can have enormous consequences for psychological and brain functioning. For instance, there is extensive and robust evidence implicating rumination in the onset and maintenance of depression (Nolen-Hoeksema et al., 2008). Depressed people often find it difficult to inhibit the processing of negative stimuli and expel them from working memory (Hertel, 2004; Joormann, 2005). Relatedly, cognitive models of depression cited above suggest that cognitive biases in people with depression endure beyond discrete episodes, characterising the functioning of individuals even when they are not currently depressed (Joorman, 2009; LeMoult & Gotlib, 2019).

Scholars identified a "cycle acceleration" of depression, i.e. that with each depressive episode the next episode tends to occur sooner and has a more severe treatment-resistant course than the preceding episode (Keller & Boland, 1998; Maj et al., 1992). Further,

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[1] Major depression is not the only form of depressive disorder. For instance, dysthmya (symptoms persisting for at least two years) or minor depression (less than five symptoms required for major depression) are also within the spectrum of depression. However, our measures are not sophisticated enough to be able to disentangle such differences.

neuroimaging and histopathologic studies have found evidence of functional and structural alterations of the brain suggesting that chronic "depression is both predisposed by and perpetuated because of alterations in neuronal function" (see Greden, 2001, pp. 7–8).

Overall, this leads us to expect that the effect of depression on political efficacy may vary cyclically and increase with multiple depressive episodes. Moreover, if depression influences individuals beyond the discrete episode, we should find evidence of this prolonged effect in our panel data. However, ours is an imperfect test because we do not know the complete depression history of our respondents. We can only observe whether the effect of depression on political efficacy is larger when individuals experience depression in previous waves.

How Political Efficacy Mediates the Depression-Voting Connection

We have presented arguments for a direct and negative effect of depression on both internal and external political efficacy and voting, and reported evidence from previous research of the effect of efficacy on voting. We conclude our theoretical section by presenting the mechanism for the depression-voting gap. We expect that, by reducing the sense of political self-efficacy and the feeling of responsiveness of the political system, depression also has an indirect effect on voting, channelled through internal and external political efficacy. As we have argued based on the resource theory of participation, internal and external political efficacy are psychological resources, which lower the threshold of voting. People with high external efficacy feel they can influence the political process are likely to see voting as more meaningful and thus have a higher likelihood of voting. Through a similar logic, high internal efficacy, which gives a person a sense of being able to grasp politics, is likely to facilitate voting.

Empirical Evidence of the Effects of Depression on Political Efficacy

To test whether depressed individuals exhibit lower levels of political efficacy than those who are not depressed, we first use cross-sectional data from Round 7 of the ESS. Then, we rely on panel data from Waves 3 and 6 of the UKHLS which enables us to account for changes in time. With both data, we start by analysing the relationship between depression and the two types of political efficacy. Then we proceed to the mediation analysis where we link depression, efficacy and voting in parliamentary elections. The direct relationships between depression and turnout are reported in the Appendix (Tables A8 and B9).

Although we use two different data, we apply certain rules to keep our empirical approach unified. In the analyses we use only a limited set of control variables (age, gender, education). The main reason is that the potential causal chains between depression, efficacy and socio-economic controls are complex and may, sometimes, be even reciprocal. For example, depression may lead to unemployment and financial problems but, conversely, financial problems may trigger mental health problems. Studies have established that age and gender are related to both efficacy and depression and depression is more common among women (Shore et al. 2019; Rai et al. 2013) and, hence, their effects should be controlled. Education is positively associated with higher efficacy and lower risk of depression, which suggests that education is a confounder that should be controlled for. However, the complication arises as depression at a young age may also lead to problems in school, which, eventually, can result in low levels of adulthood education. Hence, we tested our models also without education, but the results remained substantially similar.

A limited number of control variables makes the models easier to interpret as the likelihood of including variables that exist in the causal chain between depression and efficacy is lower. However, this strategy may lead to missing variable bias, if some important confounders are excluded. Therefore we decided on a two-pronged approach. In the main text

we present results from models with a limited set of controls but, in the online appendix, we repeated the analyses with a fuller set of controls to see if further variables affect the main results. As the data include relatively few missing values, we decided to drop observations with missing values from the analysis, instead of more complex solutions.

Cross-Sectional Analyses with ESS Data

To measure depression in the ESS round 7 data (collected in 2014), we rely on the Center for Epidemiologic Studies Depression Scale (CES-D8) (Radloff, 1977). This is a battery of eight questions pertinent to respondents' mental well-being in the previous week, which we combine into an index for self-rated depression (SRD). These questions tap into many of the depressive symptoms identified by the DSM-5 (see Appendix A). The SRD originally included scores ranging from 8 to 32, but we have rescaled the scale to between 0 and 24 for ease of interpretation, with higher values indicating more depressive symptoms. The Cronbach's alpha for the index is 0.83. 59 percent of the respondents in the sample scored between 0 and 5, indicating low values on the depression scale. The total average depression score equals 5.39 (SD = 4.05).

To measure internal political efficacy, we combine following items: "Able to take an active role in a political group" and "Confident in own ability to participate in politics" (0 = not at all and 10 = completely). External political efficacy is captured by responses to "The political system allows people to have a say in what government says" and "The political system allows people to have an influence on politics" (0 = not at all and 10 = completely). (See Table A5 in the Appendix for correlations and rotated 2-factor solution between the efficacy items.) Internal and external political efficacy both range from 0 to 20, with smaller numbers indicating less efficacy. The correlation for items defining internal political efficacy

is 0.74 and Cronbach's alpha 0.85, whereas the correlation for items defining external political efficacy is 0.68 and alpha 0.81 (see Appendix Table A4).

We analyse the pooled ESS data using a two-level model with a random intercept and random country slopes for the depression variable (see Appendix: Figure A1 for country analyses; Table A2 for variable correlations and Table A3 for descriptive statistics). Although the intraclass correlation coefficient (ICC) in both models is close to zero (0.08 for internal and 0.1 external political efficacy), a likelihood ratio (LR) test indicates that a mixed model should be preferred over a flat linear regression in both Model 1 (LR $\chi^2(2)$ = 3852.54, p < 0.001) and Model 2 (LR $\chi^2(2)$ = 5697.79, p<0.001). Also, an LR test shows a preference for a mixed model where both slope and intercept are allowed to vary over a mixed model where only the intercept is allowed to vary (LR $\chi^2(1)$ = 33.80, p < 0.001 and LR $\chi^2(1)$ = 33.98, p < 0.001 for Model 1 and Model 2, respectively).

Weights are applied at two levels: a combination of design and population weights at the observation level, and population size weights at country level. The results are presented in Table 1. Regarding our main independent variable, we find that SRD decreases both internal and external political efficacy in Model 1 and Model 2.[2] These results remain robust even with the inclusion of additional controls (Table A6 in the Appendix).

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[2] Since our second set of analyses is based on UK panel, we have re-estimated our ESS-based analyses with only the UK respondents. These analyses produce very similar results (Appendix Table A7).

Table 1. The effect of depression on internal and external political efficacy (Data: ESS-round 7)

	ESS (21 countries)	
	Internal political efficacy (1)	External political efficacy (2)
Depression	-.073** (.013)	-.102** (.011)
Age	-.017 (.010)	-.008 (.006)
Gender: Male	1.414** (.171)	.220* (.095)
Education: Advanced vocational Upper secondary Lower secondary Less than lower secondary	-1.960** (.162) -2.998** (.206) -3.657** (.147) -5.011** (.283)	-1.175** (.069) -1.649** (.208) -1.403** (.322) -1.837** (.333)
Constant	10.781** (.597)	8.932** (.662)
sd (Depression) sd (Constant) sd (Residual)	.027 (.006) 1.374 (.224) 4.741 (.093)	.035 (.009) 1.413 (.236) 4.22 (.066)
N	37,866	37,576

Notes: * p < 0.05, ** p < 0.01. Reference category: 'Female' (Gender); 'Tertiary' (Education).

Longitudinal Analyses with the UKHLS Data

The UKHLS data have been collected annually since 2009 from over 40,000 households. We use Waves 3 and 6 as only these include political efficacy items. As the data collection for a single wave was scheduled across 24 months, our data come from the 2011–13 and 2014–16 periods. We use weights to correct for possible biases (Knies, 2018).

The UKHLS offers questions on both diagnosed and self-rated depression. The first measure indicates a (self-reported) clinical depression diagnosis (CD) based on the question: "Has a doctor or other health professional ever told you that you have any of these

conditions?" Respondents were then shown a list of conditions, including "Clinical depression". Next, respondents were asked whether they still had the condition. According to this measure, about 1.3% of respondents reported being clinically depressed.

The second measure, self-rated depression (SRD), is based on questions on mental well-being, captured by the 12-Item Short Form Health Survey (SF-12) (Ware et al., 1996). This health inventory describes health states that encompass the typical effects of depression (Sugar et al., 1998). We only use the Mental Component Summary (MCS) of this scale, which consists of six questions about respondents' emotional health during the previous four weeks (see Appendix B). Although not a depression inventory, the MCS sub-scale has been validated as a means of detecting depression in population samples (Vilagut et al., 2013; Kiely & Butterworth, 2015). Questions contain five categories, forming an overall index from 6 to 30, with lower values denoting poor mental health (Cronbach's alpha = 0.85). We use 15 as a cut-off point so that all respondents scoring less than 16 on the scale are classified as depressed. Although setting a threshold to disentangle clinical versus non-clinical levels is far from easy, our cut-off point categorises about 5% of respondents in the data as depressed, which is roughly in line with the WHO's (2017) estimates of the prevalence of depression in the UK. Furthermore, as the chosen threshold is always somewhat arbitrary, we also tested alternative models where the change in the SRD score in consecutive waves for each respondent is used.

Our political efficacy measures are based on four Likert-style statements. The first two measure internal efficacy ("I think I am better informed about politics than most people"; "I consider myself to be well qualified to participate in politics") and the two latter measure external efficacy ("Public officials don't care much about what people like me think"; "People like me don't have any say in what the government does"). To produce an index for the two types of political efficacy, responses were summed together (for external efficacy, the

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scales were first reversed). As the original scales for all statements ranged from 1 to 5, the new scales varied between 2 and 10. For easier interpretation, we subtracted 2 from each scale to make them vary between 0 and 8, with higher values indicating stronger efficacy. The Pearson's correlation coefficient for internal efficacy items was 0.65 (Cronbach's alpha = 0.79) and 0.61 (Cronbach's alpha = 0.76) for external efficacy items (see Appendix Table B3; see also Table B4 for 2-factor solution between the efficacy items).

Table 2 shows the mean values of internal and external political efficacy for non-depressed individuals and those with clinical or self-reported depression. As the possible values vary between 0 and 8, the averages for all groups are slightly below the midpoint of the scale (4). For both types of efficacy, respondents with depression report lower levels, and the differences between those with and without depression are similar in size. The difference in internal efficacy levels between the two groups is about 0.4, while for external efficacy the difference is slightly larger.

Table 2. Means of internal and external political efficacy on a scale from 0 to 8 among those with and without depression (Data: UKHLS)

	Clinical depression (depressed / not depressed)	**Self-reported depression** (depressed / not depressed)
Internal efficacy	3.08 / 3.48 (t=-3.93, d.f.=413, p<0.01 Cohen's d = -0.20)	3.02 / 3.48 (t=-9.83, d.f.=2147, p<0.01 Cohen's d = -0.24)
External efficacy	2.58 / 3.30 (t=-7.65, d.f.=397, p<0.01 Cohen's d = -0.39)	2.53 / 3.34 (t=18.83, d.f.=2137, p<0.01 Cohen's d = -0.44)

Notes: Results from t-tests with unequal variances assumed in parentheses. .

As measures of efficacy are available from two waves only, we model the effects of depression on efficacy by using the latest measurement of efficacy as the dependent variable. We assume that current levels of internal or external efficacy are affected by their previous levels and to account for this we add the lagged value of efficacy in the model. The idea is that attitudes are "sluggish"; they change relatively slowly, and current levels of efficacy are hence affected by their past values. The coefficients on these lagged efficiency variables show how much current efficacy is affected by past efficacy.

Our main interest, however, is on the depression variables. We test if both the current and the previous values of depression variables are related to efficacy. If only the variable measuring current depression is significant, this suggests that there are no observable long-term effects of depression. A significant coefficient on the lagged depression variable suggests that there might be longer term effects of depression on efficacy. Finally, we add an interaction variable of the current and the lagged depression to capture the potential accumulative effect of two experienced depression incidences. A statistically significant interaction would mean that these two depression incidences have a combined accumulative effect on efficacy that is larger than just two individual episodes added together would have.

The value 1 of the clinical depression dummy variable refers to (self-reported) diagnosed depression. The SRD variable, measuring self-rated depression symptoms, is rescaled to vary between zero and one (by subtracting the minimum value from it and dividing it by its maximum value). This way the magnitudes of the coefficients are (roughly) comparable.

We present the estimates of the models visually in Figure 1 (full results reported in Appendix B5). The figure shows sizes of the depression variable coefficients and the coefficient of the lagged efficacy variable and corresponding 95% level confidence intervals when the dependent variable was internal efficacy (panels on the left) and external efficacy

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(panels on the right). The model also includes control variables (gender, age, education) but to keep the figure easy to read these are not shown (full results reported in Appendix Table B5).

Figure 1. Effects of depression and lagged efficacy on current levels of efficacy with 95% confidence intervals (Data: UKHLS)
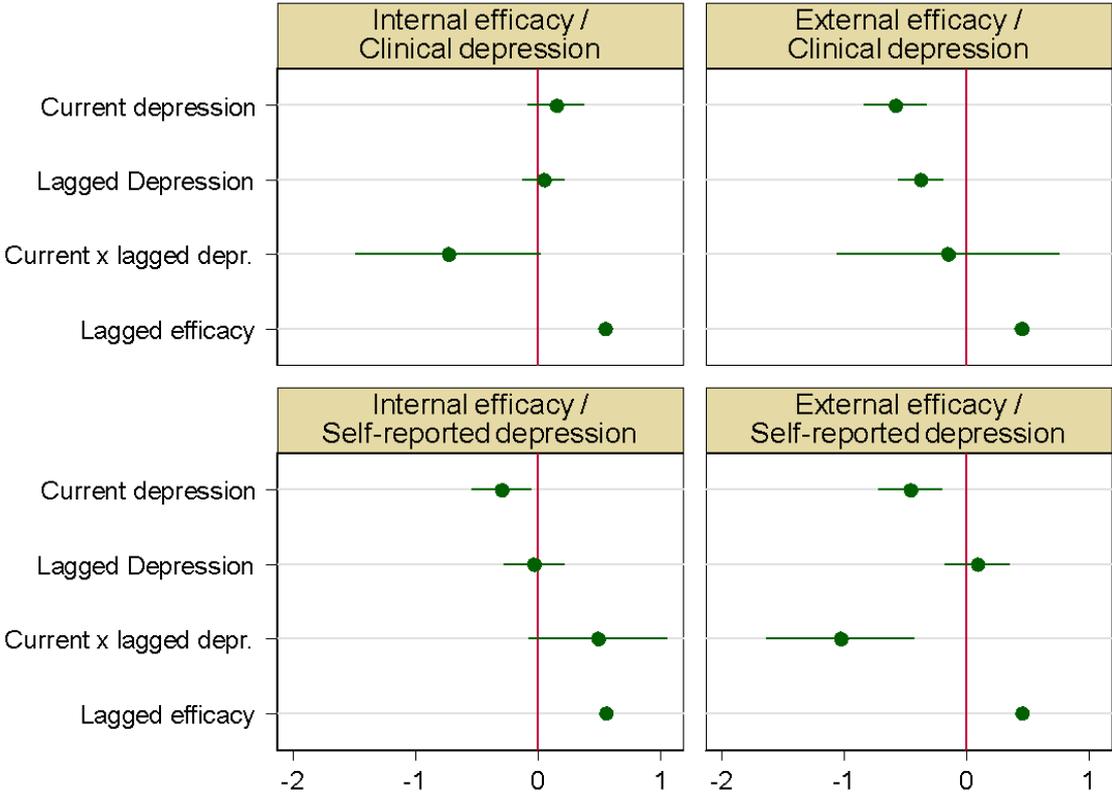
Figure 1 shows that there is no relationship between internal efficacy and depression when using the clinical measure depression (top left panel). Neither the coefficient for the current nor the lagged measure of clinical depression are statistically significant. The same is true for the interaction effect. The situation is somewhat different with self-rated depression symptoms (lower left panel). Here the variable measuring current depression is significant, indicating that persons scoring high on this measure are more likely to have lower levels of

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internal efficacy. However, in the overall evaluation of the results regarding internal efficacy one needs to be very cautious as the results are not consistent in the two models.

The results related to external efficacy are easier to interpret. Current depression is significant for both the clinical and self-rated measures of depression, indicating a negative relationship between depression and feelings of external efficacy. For self-rated depression, the interaction term is also statistically significant. This indicates that scoring high on this measure in both time points has an additional negative joint effect: the effect on efficacy is larger than just two individual depression incidences added together, suggesting a cumulatively increasing effect of multiple depression incidences.[3]

However, the previous results were based on a cross-sectional analysis (although with some lagged variables included) of the UKHLS data. Panel data can also be used to study how changes in one's depressive status affect political efficacy. Although efficacy is measured only in two waves, the self-rated depression measures are available in all waves. We utilize this to analyse if a change in the amount of self-reported depression symptoms between the current and previous wave affects efficacy.

We use both random and fixed effect models. Random-effects models (RE) produce estimates that account for both between- and within-variation of the independent variables. This means that they factor in both the differences between the panel participants and changes in time for individual participants. Random-effects models enable the inclusion of time-invariant variables, such as gender. Fixed-effects models (FE) automatically control for all

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[3] In Appendix Table B8 we replicate the accumulation effect analysis with an alternative specification. Results are largely consistent with the ones reported in Figure 1, whereby the effect of depression on external political efficacy increases with the number of times respondents indicated that they suffered from either CD or SRD.

time-invariant factors, thus alleviating the potential problem of missing variable bias, which is always a problem with observational data. In fixed-effects models, we know that time-invariant variables, such as genetic influences, childhood experiences or even stable personality traits, are controlled for.

Figure 2 shows results from analyses where we analysed how a change in the SRD score influences efficacy. Again, internal efficacy is not robustly related to depression, but the situation is different for external efficacy. Results from both random- and fixed-effects models show that when depressive symptoms for a respondent increase compared to the previous year, the level of external efficacy decreases. The within-person changes in the SRD score vary between 0 and 1. Thus the largest within-person change in SRD would imply a change of about -0.28 in external efficacy in the fixed-effects model.

Figure 2. Coefficients on the change in self-reported depression (SRD) scores on political efficacy with 95% confidence intervals. Fixed (FE) and random effects (RE) models (Data: UKHLS)
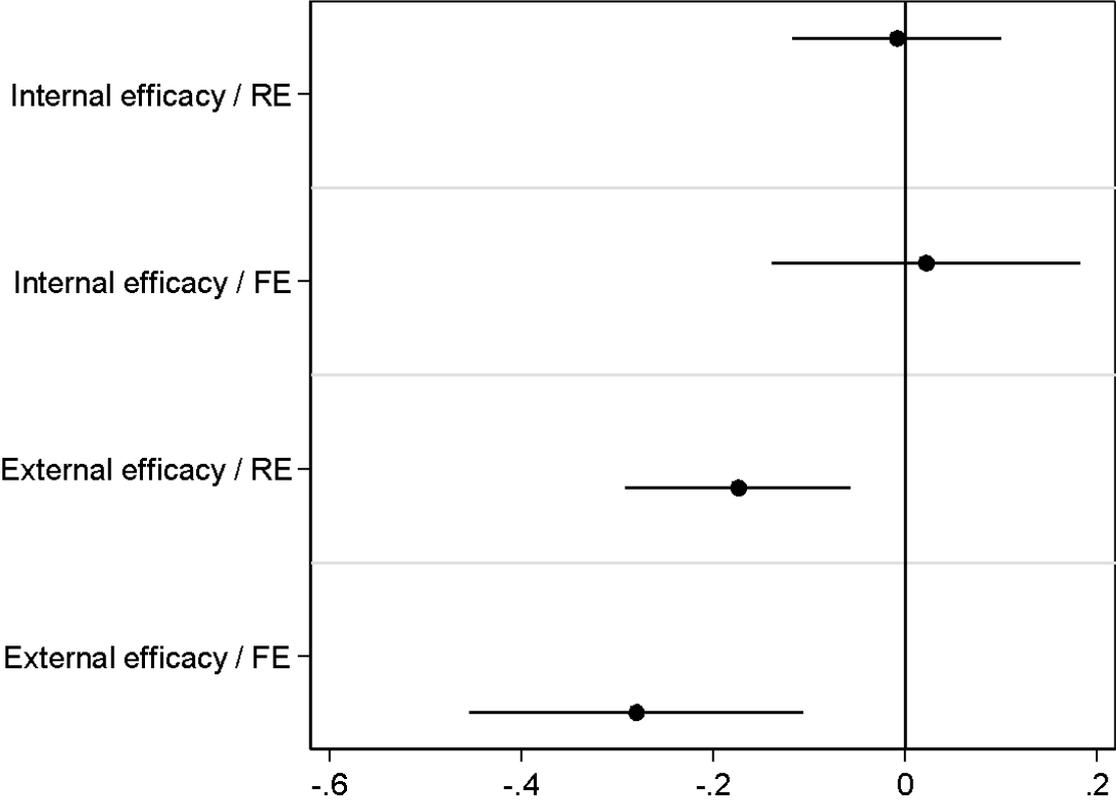
Mediation Analysis

Lastly, we perform mediation analyses where we assume that depression firstly affects feelings of efficacy, which, in turn, affect the likelihood of a respondent voting in parliamentary elections. We apply the *medsem* package developed by Mehmetoglu (2018) to decompose the effect of depression on voting, distinguishing between direct and indirect

parts. If the indirect effect is strong, we can ascertain that lowered efficacy is one mechanism through which depression impacts voting behaviour.

In the ESS data, voting is measured by asking whether respondents voted in the previous national parliamentary elections. In the UKHLS data, voting intentions were elicited with the question "Thinking of a scale that runs from 0 to 10, where 0 means very unlikely and 10 means very likely, how likely is it that you will vote in the next general election?" With both dependent variables, we used linear regression.

With the cross-sectional ESS data, it is only possible to use concurrently measured variables. However, the situation is different for the UKHLS data. Ideally, we would like to use variables for depression, efficacy and voting intention, each measured at separate times. Unfortunately, this set-up is problematic for theoretical and practical reasons. Depression is cyclical, which presents a problem as the UKHLS waves were collected annually. This means that separating the measurement of depression from the measurement of efficacy, and efficacy from the measurement of voting intentions, would mean that depression would be measured two years before voting intention, which is a long time given fluctuations in depression periods. A further problem is that voting intentions are measured only in the same modules as political efficacy. This means that we cannot separate the measurement of these two factors in time. However, depression is measured in every wave and we can lag it by one year in our mediation analysis. As one year is also a relatively long period, we decided to perform the mediation analysis in two ways. Firstly, we use data with all three variables simultaneously measured in the same wave. In the second analysis, we exploit the panel data characteristics of the UKHLS data by lagging the depression variable by one year.

Table 3. Mediation percentages of depression through efficacy for voting in previous parliamentary elections (ESS) and voting intention (UKHLS).

	ESS	*UKHLS (depression concurrent)*		*UKHLS (depression lagged)*	
		Clinical depression	Self-reported depression	Clinical depression	Self-reported depression
Internal efficacy	11% ** (-.007/ -0.001)	0 % (-0.701 / 0.003)	7% (-0.333 / -0.026)	4% (0.257 / 0.010)	8% (0.052 / -0.037)
External efficacy	10% ** (-.007 / -0.001)	23% ** (-0.701 / -0.207)	38% ** (-0.333 / -0.201)	31% * (-0.257 / -0.113)	26% ** (-0.526 / -0.185)

Notes: Direct / indirect effects in parenthesis; *p<0.05, **p<0.01.

Table 3 shows the extent to which internal and external efficacy mediate the effects of depression on voting or vote intentions (coefficients for direct and indirect effects are in parentheses, see Appendix C for details). The figures are percentages, which show how much of the effect of depression on voting is mediated through efficacy. With ESS data, results show that about 11% of the effect of depression on voting is mediated by internal efficacy, and 10% is mediated through external efficacy. In more practical terms, this means that, of the total effect depression has on voting intentions, 10% is channelled through external efficacy and the rest takes place through other mechanisms.

The UKHLS data indicate that no statistically significant mediation takes place through internal efficacy, which is unsurprising as we did not find a consistent relationship between internal efficacy and depression in these data. However, approximately 23% to 38% of the total effect of depression is mediated through external efficacy, depending on whether we use concurrent or lagged measurements of depression. Hence, the mediated effect seems to be larger in the UKHLS than in the ESS data, but the substantive significance of these

differences is difficult to evaluate as the voting questions were not formulated identically in these two surveys.

Discussion

Depression affects individuals' cognitive processes in many ways. Although results somewhat vary, we have demonstrated a link between depression and political efficacy. The cross-sectional data show that levels of both internal and external efficacy were lower among those with depression in most European countries. The panel data indicate that depression is related to lower external efficacy but the results concerning internal efficacy were less convincing. Importantly, more incidences of depression were found to have larger effects on external efficacy than just a single incident.

Our data cannot provide an answer for the discrepancy between internal and external efficacy, but the implications can be discussed. We report a negative association between depression and internal political efficacy with the ESS data, which aligns with other studies reporting associations between depression and low self-esteem, self-efficacy and sense of hopelessness. However, the results with the UKHLS data were less conclusive. Furthermore, we did not find evidence for a long-term effect on internal efficacy. Thus, it could be that, like many subjective feelings, internal political efficacy is more a trait which tends to be lower for people vulnerable to depression rather than a state subject to change. Moreover, it is possible that while depression makes it hard for persons to get things done and to function normally in everyday life, it does not necessarily affect their believes in their capacity to understand the surrounding world. Put differently, it may be that depression has an attitudinal influence on the "taking action" but not the self-perception of whether one's action matters. However, the impact of depression on internal political efficacy may be indirect. For instance, if rumination leads depressed people to believe that they lack the efficacy to engage in constructive

behaviour (Nolen-Hoeksema et al., 2008), repetitive negative thinking may be a significant mediator between depression and internal political efficacy, which future research should explore further.

Our finding that depression is negatively associated with external political efficacy may be explained by cognitive biases associated with depression (Joormann, 2009; LeMoult & Gotlib, 2019). If depressed people are negatively biased in the way they interpret information, they would also perceive government responsiveness to be lower. Hence people prone to depression would attribute bad outcomes to global, stable and internal factors (Seligman et al., 1979) – i.e., the government does not care about people like me. However, depressed individuals' worldviews, said to be more critical and realistic by some scholars (Alloy & Abramson, 1979; Gleitcher & Weary, 1991), might alternatively explain why depressed people exhibit more negative views of government responsiveness.

We also show that depression reduces external political efficacy and that an overtime accumulation of symptoms dampens external efficacy even more severely. These results make sense from a cognitive viewpoint if depressed people show negative biases which are likely to last longer than the discrete episode. As depression is not only (negatively) associated with external efficacy, but also reduces it, has important implications when trying to understand the causal effects of depression on politics.

We have also discussed whether the negative relationship between depression and political efficacy is further reflected in actual political behaviour. We examined if political efficacy can function as a mechanism, which mediates the effect of depression on voting. Again, we observed a discrepancy. The cross-sectional data suggest that internal and external efficacy both play a role in explaining the turnout gap between people with and without depression. However, the panel data show that it is only external efficacy that channels the effect of depression on voting, supporting findings from the first phase of the analysis. This

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finding may be related to the potential difference between internal and external efficacy that we pointed out above. If internal efficacy is more a trait than a state, - i.e. less likely to follow changes in persons depressive symptoms than external efficacy -, it is understandable that depression is more likely to be mediated by external than internal efficacy.

The challenge of studying the impact of depression on political behaviour is that both occur cyclically. People are not depressed all the time but typically have recurring episodes. Similarly, people do not engage in politics all the time either (usually only during elections). It is difficult to obtain data where depression and political behaviour occur within the right temporal distance from each other. We have sought to deal with this issue by using different types of data, and both lagged and unlagged variables.

Nevertheless, our findings underline the importance of mental health problems as an understudied driver of political behaviour and the significance of efficacy as a mediator between cognitive patterns and political action. Approximately one quarter to one third of the total impact of depression on voting propensity is due to low external efficacy. Our analysis reveals a mechanism through which depression lowers voting propensity by lowering a person's belief in the responsiveness of the political system. This not only pinpoints the relevance of external efficacy as a mediator between thinking and acting but also highlights the significance of responsiveness as a feature of democracy: if we wish to lower the threshold of political engagement for depressed people, it is essential to ensure that the political system is perceived as being responsive to citizens' demands. Therefore, we suggest, for instance, policy interventions that tackle policymakers' agenda representation on the mental health issue. Paying attention to policy issues people care about is a necessary condition for policy representation to occur (Bevan and Jennings, 2014; but see also Bernardi, 2021).

Following the health and political behaviour tradition, our research analysed depression as an independent variable. However, we cannot rule out that decreased levels of political efficacy might contribute to depressive symptoms. More research in this direction is needed. Relatedly, future research should consider the political environment as a factor that can negatively affect the way individuals perceive politicians' responsiveness to their needs. It would be interesting to explore whether policy implementation and feedback influenced political efficacy (Mettler & Soss, 2004), which in turn might have implications for the mental health of citizens affected by those policies.

Furthermore, alternative mechanisms, such as trust (see Mattila & Rapeli, 2018; Mattila, 2020), are likely to play a part in mediation between depression and voting, and future research should evaluate also other possibilities. Finally and crucially, future work needs to analyse whether perceived unresponsiveness translates into actual policy unresponsiveness. Evidence of under-representation in policy was found across other groups, including health groups (Pacheco & Ojeda, 2020). This leaves us pessimistic regarding mental health and perhaps may posit a tougher test for our optimistic "down but not yet out" aphorism.

References

Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness Depression: A Theory-Based Subtype of Depression. *Psychological Review* 96(2), 358–372.

Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned Helplessness in Humans: Critique and Reformulation. *Journal of Abnormal Psychology* 87(1), 49–74.

Abramson, P. R., & Aldrich, J. H. (1982). The Decline of Electoral Participation in America. *American Political Science Review* 76, 502-521.

Almond, G. A., & Verba S. (1963). *The Civic Culture: Political Attitudes and Democracy in Five Nations*. Princeton: Princeton University Press.

American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition. Washington DC: American Psychiatric Association.

Balch, G. (1974). Multiple Indicators in Survey Research: The Concept of 'Sense of Political Efficacy. *Political Methodology*, 1(1), 1-43.

Bandura, A. W., Freeman, H., & Lightsey, R. (1999). Self-Efficacy: The Exercise of Control. 158-166.

Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York: International Universities Press.

Bernardi, L. (2020). Depression and Political Predispositions: Almost Blue? *Party Politics*.

Bernardi, L. (2021). Mental Health and Political Representation: A Roadmap. *Frontiers in Political Science*.

Bernardi, L., & Johns, R. (2021). Depression and Attitudes to Change in Referendums: The Case of Brexit. *European Journal of Political Research* 60(2): 339-358.

Bevan, S., & Jennings, W. (2014). Representation, Agendas, and Institutions. *European Journal of Political Research* 53(1): 37-56.

Bono, J. E., & Judge, T. A. (2003). Core Self-Evaluations: A Review of the Trait and its Role in Job Satisfaction and Job Performance. *European Journal of Personality*, 17(1_suppl), S5-S18.

Corrigan, P.W., Rafacz, J., & Rüsch, N. (2011). Examining a progressive model of self-stigma and its impact on people with serious mental illness. *Psychiatry Research* 189(3), 339–343.

Coyne, J. C., Pepper, C. M., & Flynn, H. (1999). Significance of prior episodes of depression in two patient populations. *Journal of consulting and clinical psychology* 67(1), 76–81.

Craig, S. C., Niemi, R. G., & Silver, G. E. (1990). Political efficacy and trust: A report on the NES pilot study items. *Political Behavior*, 12(3), 289-314.

Dobson, K. S., & Dozois, D. J. A. (2008). Introduction: Assessing Risk and Resilience in Models of Depression. In K. S. Dobson & D. J. A. Dozois (Eds.). *Risk Factors in Depression* (pp. 1-16). San Diego and Burlington: Academic Press.

Edwards, J. A., & Weary, G. (1993). Depression and the Impression Formation Continuum: Piecemeal Processing Despite the Availability of Category Information. *Journal of Personality and Social Psychology* 64(4), 636-645.

Finkel, S. E. (1985). Reciprocal Effects of Participation and Political Efficacy: A Panel Analysis. *American Journal of Political Science* 29(4), 891-913.

Forgas, J. P. (1998). On Being Happy and Mistaken Mood Effects on the Fundamental Attribution Error. *Journal of Personality and Social Psychology* 75(2), 318-331.

Gleicher, F., & Weary, G. (1991). Effect of Depression on Quantity and Quality of Social Inferences. *Journal of Personality and Social Psychology* 61(1), 105-114.

Greden, J. F. (2001). The Burden of Recurrent Depression: Causes, Consequences, and Future Prospects. *Journal of Clinical Psychiatry* 62, 5–9.

Hertel, P. T. (2004). Memory for emotional and nonemotional events in depression: A question of habit? In. D. Reisberg & P. Hertel (Eds.), *Memory and emotion* (pp. 186-216). New York: Oxford University Press.

Huys, Q. J. M., Daw, N. D., & Dayan, P. (2015). Depression : A Decision-Theoretic Analysis. *Annual Review of Neuroscience* 38, 1–23.

Joormann, J. (2005). Inhibition, rumination, and mood regulation in depression. In R.W. Engle, G. Sedek, U. von Hecker, and D.N. McIntosh (Eds.). *Cognitive Limitations in Aging and Psychopathology: Attention, Working Memory, and Executive Functions* (pp. 275-312). New York: Cambridge University Press.

Joormann, J. (2009). Cognitive Aspects of Depression. In I. H. Gotlib and C. L. Hammen (Eds.). *Handbook of Depression* (2nd ed., pp. 298-321*)*, New York: The Guilford Press.

Kaelber, C. T., Moul, D.E. & Farmer, M. E. (1995). Epidemiology of depression. In E. E. Beckham and W. R. Leber (Eds.). *Handbook of Depression* (2nd ed., pp. 3-35). New York: Guilford Press.

Keller, M. B. & Boland, R. J. (1998). Implications of failing to achieve successful long-term maintenance treatment of recurrent unipolar major depression. *Biological Psychiatry* 44(5), 348–360.

Kessing, L. V. (1998). Recurrence in affective disorder: II. Effect of age and gender. *The British Journal of Psychiatry* 172(1), 29–34.

Kenski, K., & Stroud, N. J. (2006). Connections between Internet use and political efficacy, knowledge, and participation. *Journal of Broadcasting & Electronic Media*, 50(2), 173–192.

Klemmensen, R., Hatemi, P. K., Hobolt, S. B., Petersen, I., Skytthe, A., & Nørgaard, A. S. (2012). The genetics of political participation, civic duty, and political efficacy across

cultures: Denmark and the United States. *Journal of Theoretical Politics*, 24(3), 409–427.

Kiely, K. M., & Butterworth, P. (2015). Validation of four measures of mental health against depression and generalized anxiety in a community based sample. *Psychiatry Research*, 225(3), 291-298.

Knies, G. (Ed.). (2018). *Understanding Society. The UK Household Longitudinal Study Waves 1-7 User Guide*. Institute for Social and Economic Research, University of Essex. July 2018.

Landwehr, C. & Ojeda, C. (2020). Democracy and Depression: A Cross-National Study of Depressive Symptoms and Nonparticipation. *American Political Science Review*.

Leahy, R. L. (1997). An Investment Model of Depressive Resistance. *Journal of Cognitive Psychotherapy* 11(1) 3–19.

Leahy, R. L. (2001). Depressive Decision Making: Validation of the Portfolio Theory Model. *Journal of Cognitive Psychotherapy* 15(4), 341–62.

LeMoult, J. & Gotlib, I.H. (2019). Depression: A cognitive perspective. *Clinical Psychology Review 69*(August 2017): 51–66.

Lépine, J. P. & Briley, M. (2011). The increasing burden of depression. *Neuropsychiatric Disease and Treatment* 7(SUPPL.): 3–7.

Levy, B. L. M. (2013). An empirical exploration of factors related to adolescents' political efficacy *Educational Psychology*, 33(3), 357-390.

Link, B. G., & Phelan, J. C. (2001). Conceptualizing stigma. *Annual Review of Sociology* 27, 363-385.

Maciejewski, P. K., Prigerson, H. G., & Mazure, C. M. (2000). Self-efficacy as a mediator between stressful life events and depressive symptoms. *British Journal of Psychiatry* 176, 373-378.

Maj, M., Veltro, F., Pirozzi, R., Lobrace, S., et al. (1992). Pattern of recurrence of illness after recovery from an episode of major depression: A prospective study. *American Journal of Psychiatry* 149(6), 795–800.

Mathews, A., & MacLeod, C. (2005). Cognitive Vulnerability to Emotional Disorders. *Annual Review of Clinical Psychology* 1, 167-195.

Mattila, M. (2020). Does poor health mobilize people into action? Health, political trust, and participation. *European Political Science Review* 12(1), 49-65..

Mattila, M. & Rapeli, L. (2018). Just sick of it? Health and political trust in Western Europe. *European Journal of Political Research*, 57(1), 116-134.

Mattila, M., Rapeli. L., Wass, H., & Söderlund, P. (2017). *Health and political engagement.* Routledge: Abingdon.

Mehmetoglu, M. (2018). `medsem`: a Stata package for statistical mediation analysis, *International Journal of Computational Economics and Econometrics* 8, 63–78.

Mettler, S., & Soss, J. (2004). The Consequences of Public Policy for Democratic Citizenship: Bridging Policy Studies and Mass Politics. *Perspectives on Politics* 2(1), 55–73.

Morrell, M. E. (2003). Survey and Experimental Evidence for a Reliable and Valid Measure of Internal Political Efficacy *The Public Opinion Quarterly*, 67(4), 589-602.

Morrell, M. E. (2005). Deliberation, democratic decision-making and internal political efficacy. *Political Behavior*, 27(1), 49–69.

Niemi, R. G., Craig, S. C., & Mattei, F. (1991). Measuring Internal Political Efficacy in the 1988 National Election Study. *The American Political Science Review*, 85(4), 1407-1413.

Nolen-Hoeksema, S. (1991). Responses to Depression and Their Effects on the Duration of Depressive Episodes. *Journal of Abnormal Psychology*, 100(4), 569-582.

Nolen-Hoeksema, S., Wisco,, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science*, 3(5), 400-424.

Ojeda, C. & Slaughter, C. M. (2019). Intersectionality, Depression, and Voter Turnout. *Journal of Health Politics, Policy and Law*, 44(3), 479-504.

Ojeda, C. (2015). Depression and Political Participation. *Social Science Quarterly* 96(5), 1226–1243.

Ojeda, C., & Pacheco, J. (2019). Health and Voting in Young Adulthood. *British Journal of Political Science* 49(3), 1163-1186.

Pacheco, J., & Ojeda, C. (2020). A Healthy Democracy? Evidence of Unequal Representation Across Health Status. *Political Behavior* 42(4), 1245-1267.

Pateman, C. (1970). *Participation and Democratic Theory*. Cambridge: Cambridge University Press.

Paulus, M. P., & Yu, A. J. (2012). Emotion and decision-making: Affect-driven belief systems in anxiety and depression. *Trends in Cognitive Sciences* 16(9), 476–483.

Pietromonaco, P. R., & Rook, K. S. (1987). Decision Style in Depression : The Contribution of Perceived Risks Versus Benefits. *Journal of Personality and Social Psychology* 52(2), 399–408.

Radloff, L. S. (1977). The CES-D scale: a self-report depression scale for research in the general population. *Journal of Applied Psychological Measurement* 1, 385-401.

Rai, D., Zitko, P., Jones, K., Lynch, J., & Araya, R. (2013). Country- and individual-level socioeconomic determinants of depression: Multilevel cross-national comparison. British Journal of Psychiatry, 202(3), 195-203

Reher, S. (2020). Mind This Gap, Too: Political Orientations of People with Disabilities in Europe. *Political Behavior 42*(3), 791–818.

Renshon, S. A. (1974). *Psychological needs and political behavior a theory of personality and political efficacy*. New York, NY: Free Press.

Schwarz, N. (2002). Feelings as Information: Moods Influence Judgments and Processing Strategies. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.). *Heuristics and Biases. The Psychology of Intuitive Judgments*. New York, NY: Cambridge University Press.

Seligman, M. E. P., Abramson, L. Y., Semmel, A., & von Baeyer, C. (1979). Depressive Attributional Style. *Journal of Abnormal Psychology* 88(3), 242–247.

Shore, J., Rapp, C., & Stockemer, D. (2019). Health and political efficacy in context: What is the role of the welfare state? *International Journal of Comparative Sociology 60*(6), 435–457.

Smets, C. & van Ham, C. (2013). Embarrassment of riches? A meta-analysis of individual-level research on voter turnout. *Electoral Studies* 32(2), 344-359.

Solomon, D. A. et al. (2000). Multiple recurrences of major depressive disorder. *American Journal of Psychiatry* 157(2), 229–233.

Sugar, C. A., Sturm, R., Lee, T. T., Sherbourne, C. D., Olshen, R. A., Wells, K. B., & Lenert, L. A. (1998). Empirically Defined Health States for Depression from the SF-12. *Health Services Research* 33 (4 Pt 1), 911–928.

Sund, R., Lahtinen, H., Wass, H., Mattila, M., & Martikainen, P. (2017). How voter turnout varies between different chronic conditions? A population-based register study. *Journal of Epidemiology and Community Health,* 71(5), 475-479.

Vecchione, M., & Caprara, V. (2009). Personality Determinants of Political Participation: The Contribution of Traits and Self-Efficacy Beliefs. *Personality and Individual Differences* 46(4), 487-492.

Verba, S., & Nie, N.H. (1972). *Participation in America. Political Democracy and Social Equality*. New York, NY: Harper & Row.

Vilagut, G., Forero, C. G., Pinto-Meza, A., Haro, J. M., de Graaf, R., Bruffaerts, R., et al. (2013). The mental component of the Short-Form 12 Health Survey (SF-12) as a measure of depressive disorders in the general population. *Value in Health*, 16, 564–573.

Ware, J. E., Kosinski, M., & Keller, S. D. (1996). A 12-Item Short-Form Health Survey: Construction of Scales and Preliminary Tests of Reliability and Validity. *Medical Care* 34(3), 220–233.

WHO. (2017). Depression and Other Common Mental Disorders. Global Health Estimates. Geneva: World Health Organization. License: CC BY-NC-SA 3.0 IGO.

WHO. (2018). Depression. Retrieved from: http://www.who.int/news-room/fact-sheets/detail/depression

Online Appendix for "Down But Not Yet Out:

Depression, Political Efficacy, and Voting"

Appendix A: European Social Survey (ESS), Round 7

Section A1: Self-reported depression

Table A1: Average scores and number of cases (N) for dependent and independent variables

Figure A1: Coefficient estimates of self-reported depression on internal and external political efficacy for each country

Table A2: Correlations of the main variables

Table A3: Descriptive statistics of the main variables

Table A4. Bivariate regression of the depression and political efficacy variables

Table A5: Correlations & rotated 2-factor solution between the efficacy items

Figure A2. Predicted values of external and internal efficacy by different levels of self-rated depression.

Table A6: Replication of analyses in Table 1 with additional controls

Table A7. The effect of depression on internal and external political efficacy in the UK with additional controls

Table A8. The effect of depression on voting intentions

Appendix B: UK Household Longitudinal Study (UKHLS)

Section B1. Clinical depression

Section B2. Self-reported depression

Table B1. Correlations between main variables

Table B2. Descriptive statistics of the main variables

Table B3. Bivariate regression of the depression and political efficacy variables.

Table B4. Correlations & rotated 2-factor solution between the efficacy items

Table B5. Effect of depression on internal and external political efficacy

Figure B1. Predicted values of external and internal efficacy by different levels of current self-rated depression (left) and lagged self-rated depression (right).

Figure B2. Predicted values of internal and external efficacy by different levels of current clinical depression (left) and lagged clinical depression (right). Clinical depression was measured with a dummy (1=yes, 0=no). The results for the interaction term are not displayed as it was not statistically significant in these regressions.

Table B6. Effect of depression on internal and external political efficacy with additional controls

Appendix A

European Social Survey (ESS), Round 7

Section A1: <u>Self-reported depression</u>: E20-E27

I will now read out a list of the ways you might have felt or behaved during the past week. Using this card, please tell me how much of the time during the past week…

[E20]...you felt depressed?

[E21]...you felt that everything you did was an effort?

[E22]...your sleep was restless?

[E23]...you were happy?

[E24]...you felt lonely?

[E25]...you enjoyed life?

[E26]...you felt sad?

[E27]...you could not get going?

<u>Values and categories</u>:

1 None or almost none of the time

2 Some of the time

3 Most of the time

4 All or almost all of the time

Table A1: Average scores and number of cases (N) for dependent and independent variables

Country	Outcome		Independent Variables			
	EPE [0-20]	IPE [0-20]	SRD [0-24]	Age	Gender [0 /1]	Education [1/5]
Austria (AT)	6.13 (N=1,756)	8.0 (N=1,745)	4.91 (N=1,757)	49.22 (N=1,789)	.48 (N=1,795)	2.90 (N=1,790)
Belgium (BE)	6.95 (N=1,752)	7.24 (N=1,765)	4.96 (N=1,761)	46.94 (N=1,769)	.51 (N=1,769)	2.74 (N=1,757)
Switzerland (CH)	11.04 (N=1,474)	9.93 (N=1,488)	4.20 (N=1,526)	47.36 (N=1,531)	.5 (N=1,532)	2.76 (N=1,529)
Czech Republic (CZ)	6.17 (N= 2,076)	5.63 (N=2,088)	6.41 (N=2,013)	46.80 (N=2,138)	.47 (N=2,126)	2.74 (N=2,132)
Germany (DE)	7.48 (N=3,009)	9.36 (N=2,998)	5.44 (N=3,012)	49.87 (N=3,030)	.51 (N=3,045)	2.46 (N=3,031)
Denmark (DK)	10.35 (N=1,440)	10.74 (N=1,446)	4.50 (N=1,483)	48.09 (N=1,501)	.52 (N=1,502)	2.54 (N=1,496)
Estonia (EE)	5.33 (N=1,994)	5.54 (N=2,008)	6.28 (N=1,983)	50.32 (N=2,045)	.41 (N=2,051)	2.41 (N=2,049)
Spain (ES)	5.41 (N= 1,822)	7.22 (N=1,880)	5.91 (N=1,878)	48.51 (N=1,924)	.51 (N=1,925)	3.34 (N=1,921)
Finland (FI)	7.73 (N=2,048)	9.39 (N=2,054)	4.38 (N=2,055)	51.29 (N=2,086)	.49 (N=2,087)	2.69 (N=2,084)
France (FR)	6.29 (N=1,883)	7.68 (N=1,890)	5.30 (N=1,901)	49.88 (N=1,914)	.48 (N=1,917)	2.85 (N=1,912)
United Kingdom (GB)	7.11 (N=2,183)	8.20 (N=2,225)	5.38 (N=2,240)	52.20 (N=2,243)	.45 (N=2,264)	2.90 (N=2,197)
Hungary (HU)	4.54 (N=1,647)	4.81 (N=1,630)	7.0 (N=1,663)	49.87 (N=1,698)	.43 (N=1,698)	2.86 (N=1,690)
Ireland (IE)	6.32 (N=2,269)	7.47 (N=2,289)	4.58 (N=2,347)	49.39 (N=2,380)	.46 (N=2,390)	2.98 (N=2,349)
Israel (IL)	5.03 (N=2,461)	5.95 (N=2,491)	5.65 (N=2,397)	47.63 (N=2,537)	.45 (N=2,562)	2.52 (N=2,534)
Lithuania (LT)	5.58 (N=2,108)	5.89 (N=2,063)	7.09 (N=2,093)	49.73 (N=2,249)	.39 (N=2,250)	2.67 (N=2,239)
Netherlands (NL)	8.66 (N=1,877)	7.31 (N=1,912)	4.68 (N=1,914)	50.74 (N=1,916)	.45 (N=1,919)	2.82 (N=1,905)
Norway (NO)	10.50 (N=1,389)	10.56 (N=1,414)	4.03 (N=1,424)	46.73 (N=1,435)	.53 (N=1,436)	2.40 (N=1,431)
Poland (PL)	6.55 (N=1,495)	5.68 (N=1,534)	5.32 (N=1,535)	47.30 (N=1,615)	.46 (N=1,615)	3.05 (N=1,614)
Portugal (PT)	5.76 (N=1,200)	5.88 (N=1,234)	7.13 (N=1,254)	52.90 (N=1,265)	.45 (N=1,265)	3.77 (N=1,263)
Sweden (SE)	9.68 (N=1,729)	10.01 (N=1,762)	4.73 (N=1,763)	49.67 (N=1,789)	.50 (N=1,791)	2.59 (N=1,777)
Slovenia (SI)	3.66 (N=1,164)	5.11 (N=1,173)	5.06 (N=1,182)	49.58 (N=1,224)	.46 (N=1,224)	2.84 (N=1,219)
Total Sample	**6.90 (N=38,776)**	**7.52 (N=39,089)**	**5.39 (N=39,181)**	**49.27 (N=40,078)**	**.47 (N=40,163)**	**2.78 (N=39,919)**

Notes: EPE: External political efficacy; IPE: Internal political efficacy; SRD: Self-reported depression. Values of Gender: 0 'Female', 1 'Male'; Values of Education: 1 'Tertiary', 2 'Advanced vocational', 3 'Upper secondary' 4 'Lower secondary', 5 'Less than lower secondary'.

Figure A1. Coefficient estimates of self-reported depression on internal and external political efficacy for each country
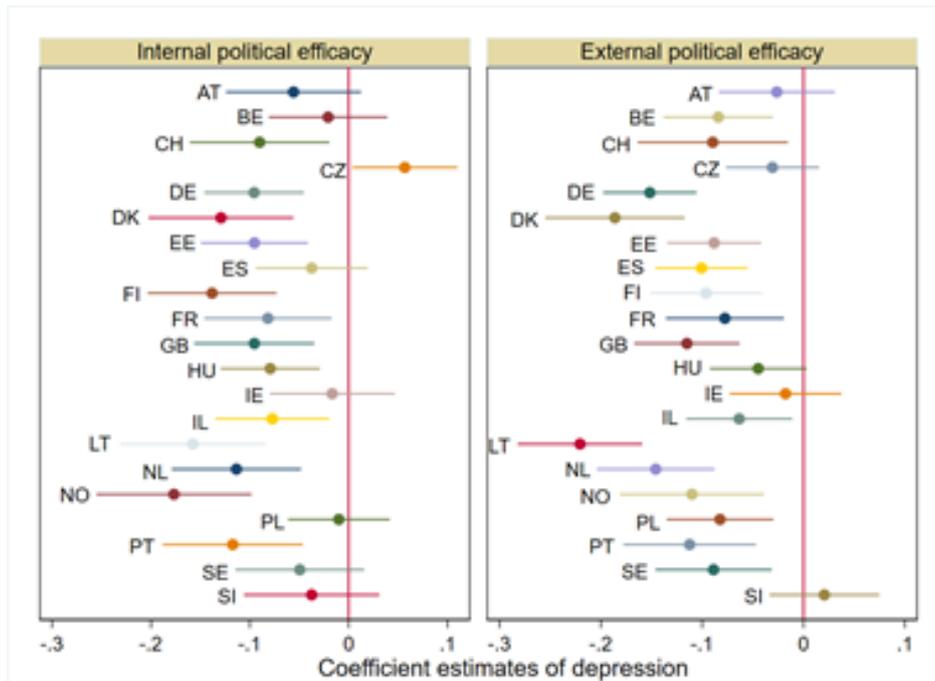
Notes: Coefficient estimates and 95% CI from linear regressions in each country (For country abbreviations see Table A1 in the Appendix).

Table A2. Correlations between main variables

	inteff	exteff	srd	age_dv	male	edlev1	edlev2	edlev3	edlev4	edlev5
inteff	1.000									
exteff	0.511	1.000								
srd	-0.170	-0.165	1.000							
age_dv	-0.144	-0.095	0.120	1.000						
male	0.148	0.056	-0.127	-0.035	1.000					
edlev1	0.268	0.190	-0.103	-0.069	-0.028	1.000				
edlev2	0.053	0.013	-0.031	0.002°	-0.007°	-0.221	1.000			
edlev3	-0.075	-0.067	-0.008°	-0.068	0.037	-0.406	-0.304	1.000		
edlev4	-0.113	-0.056	0.058	-0.045	0.002°	-0.245	-0.184	-0.338	1.000	
edlev5	-0.176	-0.106	0.119	0.257	-0.013	-0.183	-0.137	-0.252	-0.152	1.000

Notes: All correlations are statistically significant at least with p<0.05 apart from °

Table A3. Descriptive statistics of the main variables

Variable	Obs	Mean	Std. Dev.	Min	Max
inteff	39,089	7.521	5.429	0	20
exteff	38,776	6.901	4.680	0	20
srd	39,181	5.393	4.051	0	24
age_dv	40,078	49.271	18.727	14	99
male	40,163	.470	.499	0	1
edlev1	39,919	.228	.419	0	1
edlev2	39,919	.142	.349	0	1
edlev3	39,919	.358	.480	0	1
edlev4	39,919	.169	.375	0	1
edlev5	39,919	.102	.303	0	1

inteff: Internal political efficacy

exteff: External political efficacy

srd: self reported depression symptoms

age_dv = age
male = gender (1 = male)

edlevel1: tertiary education

edlevel2: advanced vocational education

edlevel3: upper secondary education

edlevel4: lower secondary education

edlevel5: less than lower secondary education

Table A4. Bivariate regression of the depression and political efficacy variables

	External efficacy	Internal efficacy
	SRD	**SRD**
Constant	7.965**	8.784**
	(.040)	(.046)
Depression	-.192**	-.228**
	(.006)	(.007)
N	37,883	38,185

Notes: **$p<0.01$; CI: 95%.

Table A5. Correlations & rotated 2-factor solution between the efficacy items

	eff1	**eff2**	**eff3**	**eff4**
eff1	1.000			
eff2	0.741	1.000		
eff3	0.378	0.358	1.000	
eff4	0.513	0.494	0.683	1.000

Notes: All entries are statistically significant with $p<0.001$.

Variable	**Factor 1**	**Factor 2**	**Uniqueness**
eff1	0.759	0.295	0.338
eff2	0.758	0.273	0.351
eff3	0.238	0.704	0.448
eff4	0.384	0.710	0.348

eff1: Able to take an active role in a political group (internal efficacy)

eff2: Confident in own ability to participate in politics (internal efficacy)

eff3: The political system allows people to have a say in what government says (external efficacy)

eff4: The political system allows people to have an influence on politics (external efficacy)

Figure A2. Predicted values of external and internal efficacy by different levels of self-rated depression. Self-rated depression was scaled to vary between 0 and 24
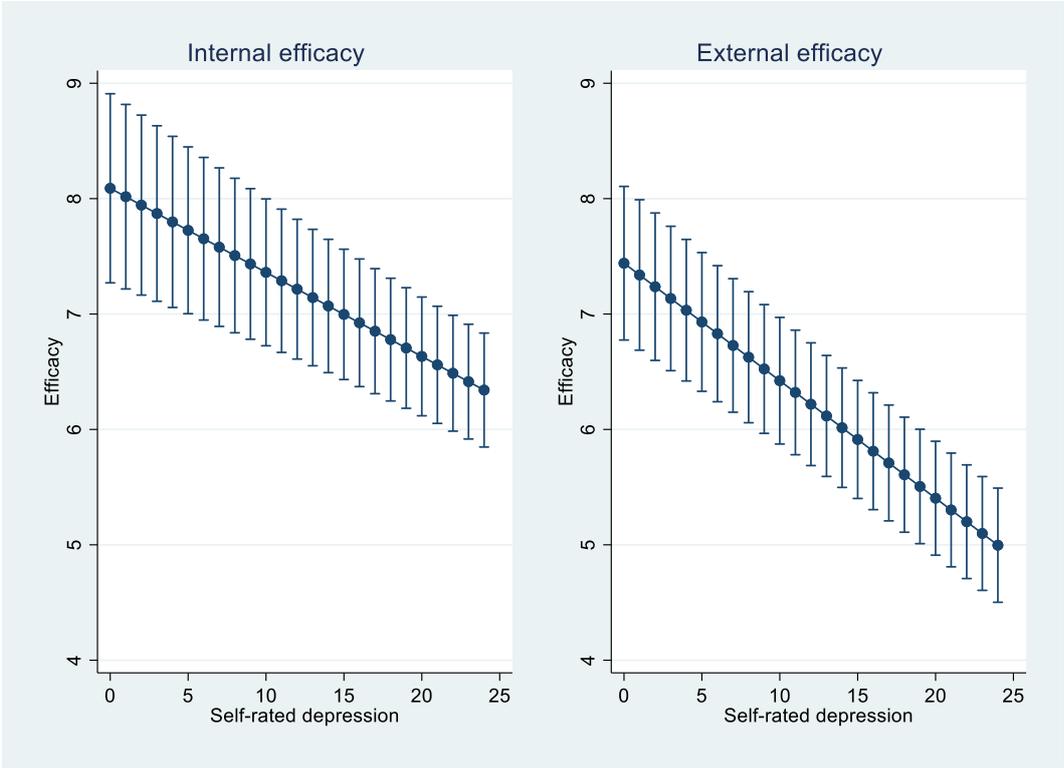
Table A6: Replication of analyses in Table 1 with additional controls

	ESS	
	Internal political efficacy	**External political efficacy**
Self-reported depression	-.060** (.012)	-.099** (.012)
Age	-.013 (.009)	-.001 (.008)
Gender (Male)	1.432** (.132)	.235* (.107)
Education		
Advanced vocational	-1.696** (.220)	-.830** (.112)
Upper secondary	-2.566** (.171)	-1.203** (.155)
Lower secondary	-3.147** (.237)	-1.057** (.189)
Less than lower secondary	-3.907** (.375)	-.958** (.267)
Marital status		
Married	-.140 (.153)	-.366** (.126)
Separated	.572 (.314)	-.479* (.208)
Widowed	-.232 (.184)	-.072 (.261)
Work type		
Central or local government	.566** (.145)	.621** (.173)
Other public sector	.648** (.242)	.749** (.115)
State owned enterprise	-.206 (.405)	-.061 (.166)
Self-employed and other	.659** (.179)	.313 (.183)
Born in country (Yes)	.139 (.464)	-.784 (.540)
Household income		
2nd decile	-.105 (.244)	-.304 (.251)
3rd decile	.124 (.344)	-.028 (.197)
4th decile	.530* (.219)	.064 (.121)
5th decile	.854** (.325)	.326** (.052)
6th decile	.538** (.175)	.378 (.238)
7th decile	.742** (.255)	.497** (.132)
8th decile	1.812** (.266)	.693** (.182)
9th decile	1.338** (.259)	.942** (.206)
10th decile	1.896** (.218)	1.073** (.238)
Constant	9.150** (.516)	8.605** (.480)
sd(Depression)	.030 (.006)	.034 (.005)
sd(Constant)	1.359 (.217)	1.421 (.238)
sd(Resudual)	4.672 (.098)	4.155 (.075)
N	28,278	28,096

Notes: Reference category: 'Female' (Gender); 'Tertiary' (Education); 'Single' (Marital status); 'A private firm' (Work type); 'No' (Born in country); * p <0.05, ** p <.001

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Table A7. The effect of depression on internal and external political efficacy in the UK with additional controls

	ESS (UK only)	
	Internal political efficacy	**External political efficacy**
Self-reported depression	-.082* (.033)	-.140** (.028)
Age	.031** (.010)	-.001 (.008)
Gender (Male)	1.408** (.262)	.240 (.224)
Education		
Advanced vocational	-2.505** (.374)	-1.050** (.316)
Upper secondary	-2.936** (.368)	-.845** (.321)
Lower secondary	-3.363** (.444)	-.488 (.374)
Less than lower secondary	-4.447** (.467)	-1.338** (.378)
Marital status		
Married	-.296 (.354)	-.174 (.292)
Separated	-.385 (.470)	.225 (.425)
Widowed	-1.029 (.555)	.781 (.456)
Work type		
Central or local government	.420 (.461)	.365 (.389)
Other public sector	.259 (.348)	.858** (.292)
State owned enterprise	-1.571 (.996)	-.631 (.723)
Self-employed and other	.934* (.396)	.989** (.351)
Born in country (Yes)	.343 (.407)	-1.915** (.363)
Household income		
2nd decile	.230 (.508)	.422 (.434)
3rd decile	.707 (.520)	.123 (.429)
4th decile	.809 (.557)	.495 (.498)
5th decile	1.186* (.550)	.222 (.505)
6th decile	.645 (.593)	.904 (.501)
7th decile	1.297* (.596)	.525 (.454)
8th decile	1.703** (.561)	.928* (.471)
9th decile	1.686** (.589)	1.493** (.487)
10th decile	2.690** (.620)	.828 (.490)
Constant	7.881** (.703)	9.365** (.618)
N	1,752	1,729

Notes: Reference category: 'Female' (Gender); 'Tertiary' (Education); 'Single' (Marital status); 'A private firm' (Work type); 'No' (Born in country); * $p < 0.05$, ** $p < 0.01$.

Table A8. The effect of depression on voting (standard errors in parentheses)

Self-reported depression	-.009*
	(.001)
Age	.015***
	(.001)
Age squared	-.091**
	(.011)
Gender (1=Male)	.014*
	(.007)
Education°	
Advanced vocational	-.053**
	(.011)
Upper secondary	
	-.106**
Lower secondary	(.009)
Less than lower secondary	-.178**
	(.012)
	-.197**
	(.015)
Country dummies	Yes
Constant	.407***
	(.032)

Notes: ° Reference category for Education is "Tertiary"; *p<0.05, **p<0.01, ***p<0.001.

Appendix B

UK Household Longitudinal Study (UKHLS)

<u>Section B1: Clinical Depression</u>
Hcond. Diagnosed health conditions
Q: Has a doctor or other health professional ever told you that you have any of the conditions listed on this card? Please just tell me the numbers that apply.
A: Option 17: Clinical depression.

Hconds17. Still has clinical depression
Q: Do you still have clinical depression?
A: Option 1: Yes; Option 2: No.

<u>Section B2: Self-reported Depression</u>
Sf4a. Emotional problems: accomplished less
Q: During the past 4 weeks, how much of the time have you accomplished less than you would like as a result of any emotional problems (such as feeling depressed or anxious)?
A: All of the time; Most of the time; Some of the time; A little of the time; None of the time.

Sf4b. Emotional problems: less carefully than usual
Q: During the past 4 weeks, how much of the time did you work or other regular daily activities less carefully than usual as a result of any emotional problems, such as feeling depressed or anxious?
A: All of the time; Most of the time; Some of the time; A little of the time; None of the time.

Sf6a. Felt calm and peaceful
Q: How much of the time during the past 4 weeks have you felt calm and peaceful?
A: All of the time; Most of the time; Some of the time; A little of the time; None of the time.

Sf6b. Had a lot of energy
Q: How much of the time during the past 4 weeks did you have a lot of energy?
A: All of the time; Most of the time; Some of the time; A little of the time; None of the time.

Sf6c. Felt downhearted and depressed
Q: How much of the time during the past 4 weeks have you felt downhearted and depressed?
A: All of the time; Most of the time; Some of the time; A little of the time; None of the time.

Sf7. Health or emotional problems interfered with social activities
Q: During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities like visiting friends or relatives?
A: All of the time; Most of the time; Some of the time; A little of the time; None of the time.

Table B1. Correlations between main variables (*p<0.05)

	inteff	exteff	depression	srd	age_dv	male	edlev1	edlev2	edlev3	edlev4	edlev5	edlev6
inteff	1.000											
exteff	0.187*	1.000										
depression	-0.019*	-0.040*	1.000									
srd	0.083*	0.153*	-0.167*	1.000								
age_dv	0.052*	-0.085*	-0.027*	0.052*	1.000							
male	0.237*	-0.020	-0.024*	0.106*	0.033*	1.000						
edlev1	0.282*	0.197*	-0.014	0.074*	-0.150	0.033*	1.000					
edlev2	0.012	0.032*	-0.001	0.022*	0.017	-0.048*	-0.252*	1.000				
edlev3	-0.026	-0.002	0.001	0.009	-0.171	0.073*	-0.308*	-0.196*	1.000			
edlev4	-0.127*	-0.071*	0.008	-0.015	-0.042	-0.038*	-0.300*	-0.191*	-0.233*	1.000		
edlev5	-0.087*	-0.099*	-0.003	-0.031*	0.182	0.004	-0.207*	-0.132*	-0.161*	-0.157*	1.000	
edlev6	-0.152*	-0.139*	0.014	-0.097*	0.300	-0.044*	-0.213*	-0.135*	-0.165*	-0.161*	-0.111*	1.000

inteff = internal efficacy

exteff = external efficacy

depression = clinical depression

srd = self reported depression symptoms

age_dv = age

male = gender (1 = male)

edlev1 = degree

edlev2 = Other higher degree

edlev3 = A-level

edlev4 = GCSE

edlev5 = Other qualification

edlev6 = No qualification

Table B2. Descriptive statistics of the main variables

Variable	Obs	Mean	Std. Dev.	Min	Max
inteff	17,088	3.652	1.933	0	8
exteff	17,210	3.339	1.852	0	8
depresssion	17,162	.009	.092	0	1
srd	17,210	24.072	4.252	6	30
age_dv	17,210	52.052	16.742	18	102
male	17,210	.430	.495	0	1
edlev1	17,210	.284	.451	0	1
edlev2	17,210	.138	.345	0	1
edlev3	17,210	.193	.395	0	1
edlev4	17,210	.185	.388	0	1
edlev5	17,210	.098	.297	0	1
edlev6	17,210	.103	.304	0	1

inteff = internal efficacy

exteff = external efficacy

depression = clinical depression

srd = self reported depression symptoms

age_dv = age

male = gender (1 = male)

edlev1 = degree

edlev2 = Other higher degree

edlev3 = A-level

edlev4 = GCSE

edlev5 = Other qualification

edlev6 = No qualification

Table B3. Bivariate regression of the depression and political efficacy variables.

	External efficacy		Internal efficacy	
	Clinical	**SRD**	**Clinical**	**SRD**
Constant	3.59**	3.72**	3.30**	3.85**
	(0.01)	(0.02)	(0.01)	(0.03)
Depression	-0.37*	-1.67**	-0.91**	-0.94**
	(0.15)	(0.08)	(0.01)	(0.08)
N	18,707	18,142	18,858	18,012

Notes: * p<0.05, **p<0.01; 95% CI.

Table B4. Correlations & rotated 2-factor solution between the efficacy items

	eff1	eff2	eff3	eff4
eff1	1.000			
eff2	0.651	1.000		
eff3	0.142	0.090	1.000	
eff4	0.208	0.147	0.608	1.000

Variable	Factor 1	Factor 2	Uniqueness
eff1	0.730	0.133	0.450
eff2	0.728	0.068	0.466
eff3	0.071	0.693	0.515
eff4	0.140	0.695	0.497

eff1 = I consider myself to be well qualified to participate in politics (internal efficacy)
eff2 = I think I am better informed about politics than most people (internal efficacy)
eff3 = Public officials don't care much about what people like me think (external efficacy)
eff4 = People like me don't have any say in what the government does (external efficacy)

Table B5. The effect of depression on internal and external political efficacy (standard errors in parentheses)

	Internal efficacy / SRD	External efficacy / SRD	Internal efficacy / Clinical depression	External efficacy / Clinical depression
Depression (current)	-0.30*	-0.46**	0.15	-0.58**
	(0.12)	(0.13)	(0.12)	(0.13)
Lagged depression	-0.03	0.09	0.05	-0.38**
	(0.13)	(0.14)	(0.09)	(0.10)
Interaction	0.49	-1.03**	-0.73	-0.15
	(0.29)	(0.31)	(0.39)	(0.46)
Lagged efficacy	0.56**	0.45**	0.55**	0.45**
	(0.01)	(0.01)	(0.01)	(0.01)
Age	0.01**	0.00	0.01**	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Gender (1=male)	0.44**	-0.11**	0.43**	-0.06**
	(0.02)	(0.02)	(0.02)	(0.02)
Education°				
Other higher degree	-0.35**	-0.22**	-0.38**	-0.24**
	(0.04)	(0.04)	(0.04)	(0.04)
A level etc.	-0.43**	-0.28**	-0.47**	-0.35**
	(0.03)	(0.04)	(0.03)	(0.04)
GCSE etc.	-0.62**	-0.44**	-0.64**	-0.48**
	(0.04)	(0.04)	(0.03)	(0.04)
Other qualification	-0.72**	-0.59**	-0.73**	-0.65**
	(0.05)	(0.05)	(0.04)	(0.05)
No qualification	-0.87**	-0.69**	-0.96**	-0.78**
	(0.05)	(0.05)	(0.04)	(0.04)
Constant	1.61**	2.34**	1.61**	2.18**
	(0.06)	(0.07)	(0.04)	(0.05)
N	17527	17261	19371	19039

Notes: ° Reference category for Education is "Degree"; *p<0.05. **p<0.01.

Figure B1. Predicted values of external and internal efficacy by different levels of current self-rated depression (left) and lagged self-rated depression (right). Self-rated depression was scaled to vary between 0 and 1. Only the first figure with external efficacy includes the interaction term as it was not statistically significant in other regressions. The continuous interaction term can vary between 0 and 1 and predictions for three potential values are displayed (0, 0.5 and 1).
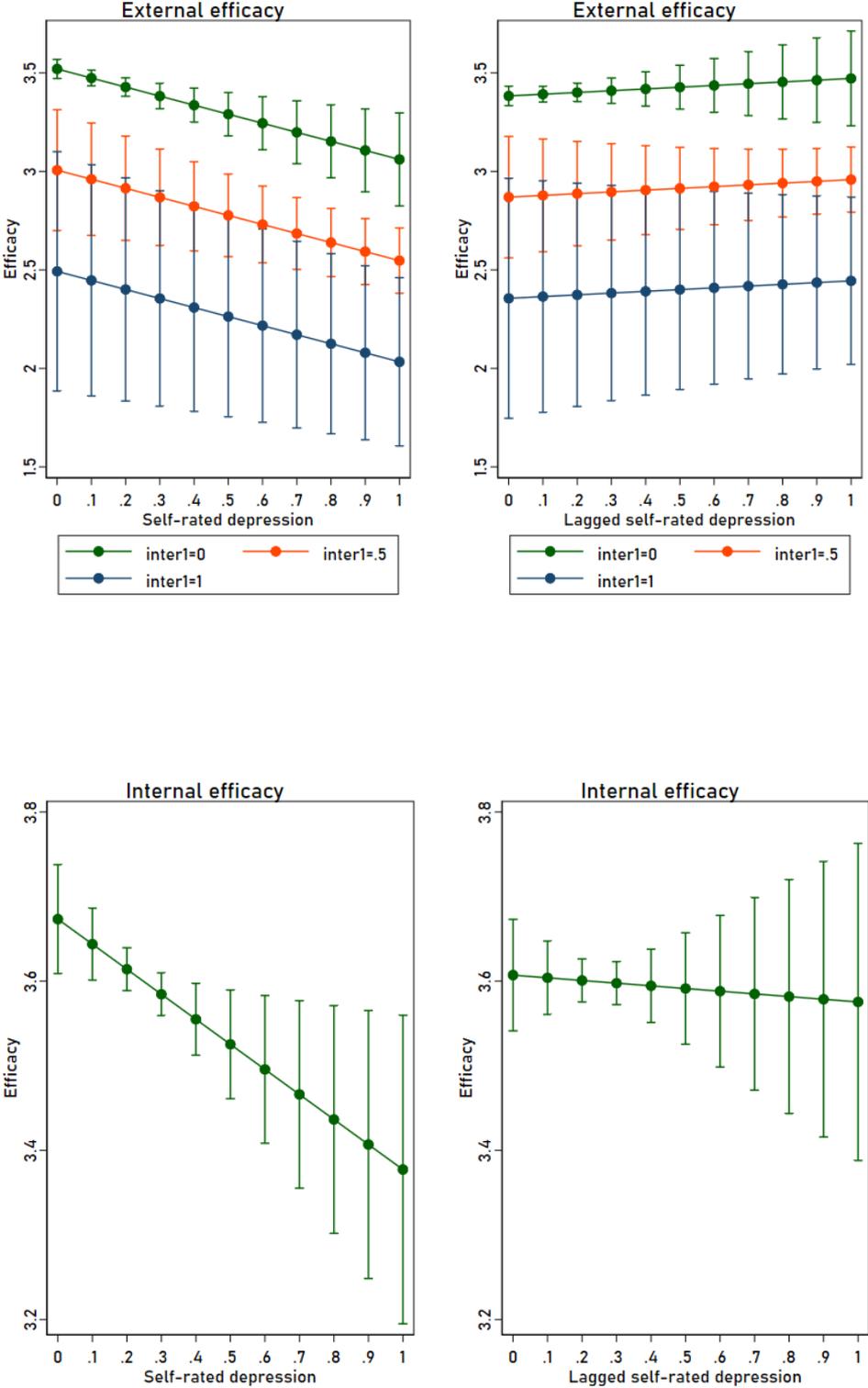
Figure B2. Predicted values of internal and external efficacy by different levels of current clinical depression (left) and lagged clinical depression (right). Clinical depression was measured with a dummy (1=yes, 0=no). The results for the interaction term are not displayed as it was not statistically significant in these regressions.
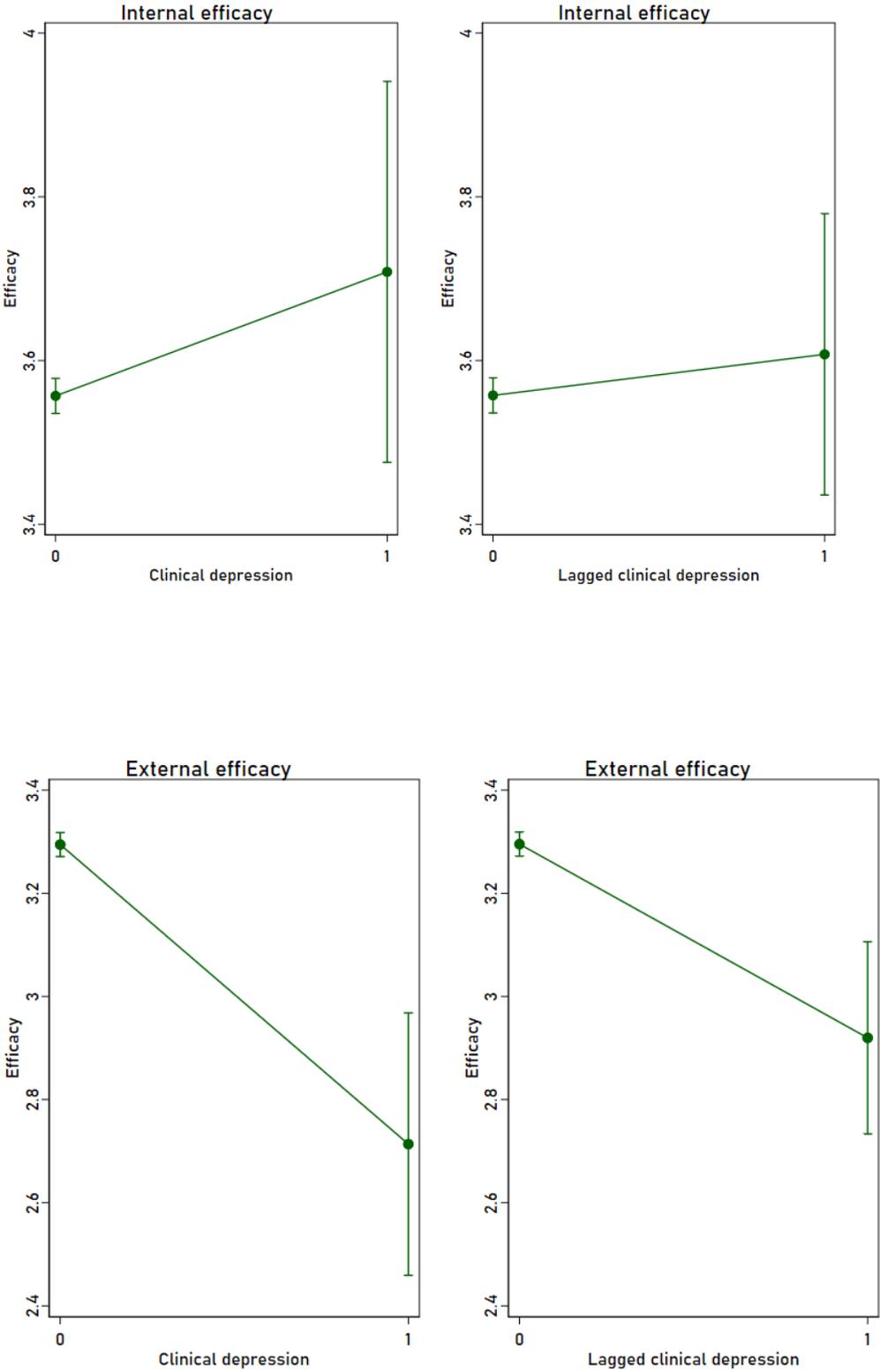
Table B6. The effect of depression on internal and external political efficacy with additional controls (standard errors in parentheses)

	Internal efficacy / SRD	External efficacy / SRD	Internal efficacy / Clinical depression	External efficacy / Clinical depression
Depression (current)	-0.26*	-0.39**	0.15	-0.51**
	(0.12)	(0.13)	(0.12)	(0.13)
Lagged depression	0.02	0.11	0.05	-0.31**
	(0.13)	(0.14)	(0.09)	(0.10)
Interaction	0.31	-1.03**	-0.73	-0.21
	(0.29)	(0.31)	(0.39)	(0.46)
Lagged efficacy	0.55**	0.45**	0.54**	0.44**
	(0.01)	(0.01)	(0.01)	(0.01)
Age	0.01**	-0.00	0.01**	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Gender (1=male)	0.43**	-0.13**	0.41**	-0.10**
	(0.02)	(0.03)	(0.02)	(0.03)
Education°				
Other higher degree	-0.30**	-0.15**	-0.32**	-0.16**
	(0.04)	(0.04)	(0.04)	(0.04)
A level etc.	-0.35**	-0.18**	-0.38**	-0.23**
	(0.04)	(0.04)	(0.04)	(0.04)
GCSE etc.	-0.54**	-0.32**	-0.55**	-0.34**
	(0.04)	(0.04)	(0.04)	(0.04)
Other qualification	-0.63**	-0.48**	-0.63**	-0.51**
	(0.05)	(0.05)	(0.04)	(0.05)
No qualification	-0.80**	-0.57**	-0.87**	-0.62**
	(0.05)	(0.05)	(0.04)	(0.05)
Marital status				
Married	0.00	0.10**	0.02	0.13**
	(0.03)	(0.03)	(0.03)	(0.03)
Divorced	0.00	-0.07	0.02	-0.10*
	(0.04)	(0.05)	(0.04)	(0.05)
Widowed	-0.17**	0.22**	-0.17**	0.19**
	(0.06)	(0.06)	(0.05)	(0.06)
Occupational				

class				
Intermediate	-0.09*	-0.04	-0.09	-0.02
	(0.05)	(0.05)	(0.05)	(0.05)
Small employer	-0.11*	-0.01	-0.12*	-0.02
	(0.05)	(0.06)	(0.05)	(0.06)
Lower supervisory	-0.26**	-0.18**	-0.22**	-0.17**
	(0.06)	(0.06)	(0.06)	(0.06)
Semi-routine & routine	-0.24**	-0.21**	-0.25**	-0.18**
	(0.04)	(0.04)	(0.04)	(0.04)
Inapplicable	0.00	-0.14**	-0.01	-0.20**
	(0.04)	(0.04)	(0.04)	(0.04)
Born in the UK	-0.05	-0.10*	-0.04	-0.17**
	(0.04)	(0.04)	(0.04)	(0.04)
Personal monthly income (gross)	0.00*	0.00**	0.00**	0.00**
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	1.69**	2.39**	1.67**	2.25**
	(0.07)	(0.08)	(0.06)	(0.07)
N	17350	17087	19188	18858

Notes:° Reference category for Education is "Degree"; *p<0.05, **p<0.01.

Table B7. The effect of change in the number of self-rated depressive symptoms on internal and external political efficacy (Standard errors in parentheses)

	(1) Internal efficacy RE	(2) Internal efficacy FE	(3) External efficacy RE	(4) External efficacy FE
Age	0.02**	0.07	-0.00**	0.06
	(0.00)	(0.05)	(0.00)	(0.05)
Male	0.82**		0.09**	
	(0.02)		(0.02)	
Education°				
Other higher degree	-0.90**	-0.21	-0.45**	-0.21
	(0.04)	(0.17)	(0.04)	(0.09)
A level etc.	-0.97**	-0.04	-0.58**	-0.08
	(0.03)	(0.12)	(0.03)	(0.15)
GCSE etc.	-1.45**	-0.05	-0.87**	0.12
	(0.03)	(0.18)	(0.03)	(0.21)
Other qualification	-1.64**	-0.46	-1.13**	-0.29
	(0.40)	(0.29)	(0.04)	(0.32)
No qualification	-1.99**	-0.18	-1.29**	-0.56
	(0.04)	(0.39)	(0.04)	(0.47)
Wave t_2 (dummy)	0.06**	-0.08	0.03*	-0.16
	(0.01)	(0.15)	(0.01)	(0.17)
Depression variables				
Change in the number of symptoms	-0.01	0.02	-0.17**	-0.28**
	(0.06)	(0.08)	(0.06)	(0.09)
Constant	3.31**	0.42*	4.09**	0.32**
	(0.04)	(0.08)	(0.04)	(2.53)
Observations	34,362	34,362	34,057	34,057

Notes: ° Reference category for Education is "Degree"; *p<0.05, **p<0.01; 95% CI.

Table B8. The cumulative effect of multiple depression periods on internal and external political efficacy with 95% confidence intervals (Data: UKHLS)

	(1)	(2)	(3)	(4)
	Internal efficacy / Clinical depression	Internal efficacy / Self-reported depression	External efficacy / Clinical depression	Externa efficacy / Self-reported depression
Age	0.02**	0.02	-0.00**	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Male	0.82**	0.82**	-0.09**	-0.11**
	(0.02)	(0.02)	(0.02)	(0.02)
Education°				
Other higher degree	-0.88**	-0.88**	-0.44**	-0.43**
	(0.03)	(0.03)	(0.03)	(0.03)
A level etc.	-1.08**	-1.08**	-0.63**	-0.61
	(0.03)	(0.03)	(0.03)	(0.03)
GCSE etc.	-1.47**	-1.46**	-0.89**	-0.87**
	(0.03)	(0.03)	(0.03)	(0.03)
Other qualification	-1.65**	-1.64	-1.07**	-1.03**
	(0.04)	(0.08)	(0.04)	(0.04)
No qualification	-2.13**	-2.12	-1.28**	-1.18**
	(0.04)	(0.32)	(0.04)	(0.09)
Depression variables				
Depression in 1 wave	0.01	-0.07	-0.45**	-0.36**
	(0.05)	(0.04)	(0.05)	(0.04)
Depression in 2 waves	-0.16	-0.09	-0.62**	-0.54**
	(0.11)	(0.06)	(0.11)	(0.06)
Depression in 3 waves	-0.09	-0.08	-0.99**	-0.73**
	(0.27)	(0.08)	(0.28)	(0.08)
Depression in 4 or 5 waves	1.06	-0.02	-2.07**	-1.18**
	(0.63)	(0.09)	(0.63)	(0.09)
Constant	5.31**	5.32**	6.09**	6.12**
	(0.04)	(0.04)	(0.04)	(0.04)
Observations	32,277	32,277	31,772	31,772

Notes: ° Reference category for Education is "Degree"; *p<0.05, **p<0.01; 95% CI.

Here, we investigate further how multiple depression incidences affect levels of efficacy. We assume that the effect of depression on efficacy is stronger for people who have experienced multiple depression episodes. As depression is measured in every wave of the UKHLS data, we counted the number of times respondents indicated that they suffered from either clinical depression or self-rated depression symptoms before the sixth wave of the panel, in which efficacy was also measured. For the SRD measure we used the same dichotomisation as in Table 2 in the main text. We used OLS regression where efficacy was the dependent variable

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and the number of previous depression periods the main independent variable. As the number of respondents with more than three incidences of depression is relatively small in the data, we included all respondents with more than four periods in the same category. To see if the relationship is non-linear, we created dummy variables for each number of depressive episodes. The results are depicted above. There is no relationship between the number of depression periods and internal efficacy. However, the situation with external efficacy is different. The results with both clinical and self-reported depression indicate cumulativeness as each additional depression incidence lowers the feelings of external efficacy further. For respondents with four or five depression periods, the external efficacy score is almost two points lower than for those with no depression periods at all. This is a notable difference given that the average value for external efficacy in the whole sample is a little over three.

Table B9. The effect of depression on voting intentions (standard errors in parentheses. *p<0.05, **p<0.01)

	Clinical concurrent	Clinical lagged	Self-reported concurrent	Self-reported lagged
Depression	-1.01**	-0.35	-0.51**	-0.67**
	(0.28)	(0.30)	(0.13)	(0.14)
Age	0.07**	0.08**	0.07**	0.07**
	(0.01)	(0.01)	(0.01)	(0.01)
Age squared	-0.00	-0.00**	-0.00	-0.00 *
	(0.00)	(0.00)	(0.00)	(0.00)
Gender (1=male)	0.08	-0.10	0.08	0.08
	(0.05)	(0.05)	(0.08)	(0.05)
Education°				
Other higher degree	-0.93**	-0.97**	-0.93**	-0.95**
	(0.08)	(0.08)	(0.08)	(0.08)
A level etc.	-1.09**	-1.16**	-1.07**	-1.12**
	(0.07)	(0.07)	(0.07)	(0.07)
GCSE etc.	-1.93**	-2.02**	-1.91**	-1.99**
	(0.07)	(0.08)	(0.07)	(0.08)
Other qualification	-2.10**	-2.14**	-2.08**	-2.10**
	(0.09)	(0.10)	(0.09)	(0.10)
No qualification	-2.36**	-2.44**	-2.32**	-2.40**
	(0.09)	(0.10)	(0.09)	(0.10)
Constant	5.99**	5.88**	6.00**	6.08**
	(0.20)	(0.22)	(0.19)	(0.21)

Notes: ° Reference category for Education is "Degree"; *p<0.05. **p<0.01.

Appendix C

Mediation Analysis

Tables C1 (the ESS data) and C2-C3 (the UKHLS data) present detailed results from the mediation analysis. We used the *medsem* package for Stata in the analyses (Mehmetoglu 2018). *Medsem* is an improvement over many previous mediation packages as it uses the structural equations modelling (SEM) framework to estimate all mediation equations simultaneously. The *medsem* package is also able to incorporate weights in models.

The tables first show the two regression parts of the mediation model (the one between 'treatment' (=depression) and the mediator (internal or external efficacy and the one between treatment, mediator and the dependent variable (=voting)). The bottom part of the table presents results from the statistical tests for the indirect (mediated) effects.

For the ESS data (Table C1), we used a linear probability model as the *medsem* package works only with the SEM command in Stata (not with the GSEM command) and the dependent variable was measured as a dichotomy (voted vs. did not vote). However, we repeated these models with the *khb* package (Breen et al. 2013), which is another mediation analysis package for Stata that can accommodate both linear and probit models. Findings showed that, whether one assumes a linear or a linear probability model, results are essential the same. *khb*, however, can only accommodate one set of control variables which is common for the two regressions. This is not convenient in our case since internal and external political efficacy affect voting, but internal (external) efficacy does not causally explain external (internal) efficacy. On the other hand, SEM can handle cases where the control variables are different in the two equations.

For the UKHLS data (tables C2 and C3) we used a linear model as the dependent variable, vote intention, was measured with a 1-10 scale.

Finally, we also note that, unfortunately, we were not able to perform sensitivity analysis, as we were not able to locate a Stata package that would be able to perform such analysis for non-linear models with weighted data.

References:

Breen R., Karlson, K. B. & Holm, A. (2013). Total, direct, and indirect effects in logit and probit models. *Sociological Methods & Research* 42(2), 164-191.

Mehmetoglu, M. (2018). *medsem*: a Stata package for statistical mediation analysis. *International Journal of Computational Economics and Econometrics* 8, 63−78.

Table C1. The mediation analysis with the self-reported depression variable-ESS (linear probability models).

	Self-reported depression (concurrent)-ESS			
	Internal efficacy		External efficacy	
	DV: internal efficacy	DV: turnout (0/1)	DV: external efficacy (0-20)	DV: turnout (0/1)
Depression	-.083**	-.007**	-.101**	-.007**
External efficacy	-	.008**	-	.008**
Internal efficacy	-	.010**	-	.010**
Age	.096**	.014**	-.001	.014**
Age-squared$\times 10^{-3}$	-1.095**	-.077**	.054	-.077**
Education°				
Advanced vocational	-1.957**	-.023*	-1.280**	-.023*
Upper secondary	-2.932**	-.062**	-1.734**	-.062**
Lower secondary	-3.76**	-.124**	-1.845**	-.124**
Less than lower secondary	-4.923***	-.124**	-2.088**	-.124**
Gender (male)	1.491**	-.006	.339**	-.006
Country (dummies)	Yes	Yes	Yes	Yes
Constant	8.821**	.264**	8.280**	.264*
Direct/Indirect effect	-.007** / -0.001**		-.007*** /-0.001**	
p (indirect effect)	0.00		0.00	
% mediated	11%		10%	

Notes: DV=dependent variable; ° Reference category for Education is "Tertiary"; *p<0.05, **p<0.01.

Table C2. The mediation analysis with the clinical depression variable (concurrent and lagged, linear models).

	Clinical depression (concurrent)				Clinical depression (lagged)			
	Internal efficacy		External efficacy		Internal efficacy		External efficacy	
	DV: internal efficacy	DV: intention to vote (1-10)	DV: external efficacy	DV: intention to vote (1-10)	DV: internal efficacy	DV: intention to vote (1-10)	DV: external efficacy	DV: intention to vote (1-10)
Depression	0.01	-0.70**	-0.77**	-0.70**	0.02	-0.26	-0.42**	-0.26
External efficacy	-	0.27**	-	0.27**	-	0.27**	-	0.27**
Internal efficacy	-	0.51**	-	0.51**	-	0.50**	-	0.50**
Age	0.02**	0.05**	-0.02**	0.05**	0.03**	0.06**	-0.02**	0.06**
Age^2	-0.00	-0.00	0.00	-0.00	-0.00	-0.00*	0.00	-0.00*
Education°								
Other higher degree	-0.90**	-0.34**	-0.47**	-0.34**	-0.90**	-0.36**	-0.47**	-0.36**
A level etc.	-1.02**	-0.44**	-0.62**	-0.44**	-1.04**	-0.45**	-0.63**	-0.45**
GCSE etc.	-1.46**	-0.98**	-0.89**	-0.98**	-1.47**	-1.01**	-0.90**	-1.01**
Other qualification	-1.63**	-0.94**	-1.17**	-0.94**	-1.63**	-0.97**	-1.18**	-0.97**
No qualification	-2.04**	-0.99**	-1.36**	-0.99**	-2.05**	-1.00**	-1.37**	-1.00**
Gender (male)	0.83**	-0.33**	-0.10	-0.33**	0.84**	-0.31**	-0.10**	-0.31**
Constant	5.34**	1.95**	6.55**	1.95**	5.19**	1.82**	6.48**	1.82**
Direct / Indirect effect	-0.701 / 0.003		-0.701 / -0.207**		0.257 / 0.010		-0.257 / -0.113*	
p (indirect effect)	0.975		0.000		0.885		0.011	
% mediated	0 %		23 %		4 %		31 %	

Notes: DV=dependent variable; Reference category for Education is "Degree"; *p<0.05, **p<0.01.

Table C3. The mediation analysis with the self-reported depression variable (concurrent and lagged, linear models).

	Self-reported depression (concurrent)				Self-reported depression (lagged)			
	Internal efficacy		External efficacy		Internal efficacy		External efficacy	
	DV: internal efficacy	DV: intention to vote (1-10)	DV: external efficacy	DV: intention to vote (1-10)	DV: internal efficacy	DV: intention to vote (1-10)	DV: external efficacy	DV: intention to vote (1-10)
Depression	-0.05	-0.33**	-0.76**	-0.33**	0.07	-0.53*	-0.71**	-0.53*
External efficacy	-	0.26**	-	0.26**	-	0.26**	-	0.25**
Internal efficacy	-	0.50**	-	0.50**	-	0.50**	-	0.50**
Age	0.02**	0.05**	-0.02**	0.05**	0.02**	0.06**	-0.02**	0.06**
Age^2	-0.00	-0.00	0.00	-0.00	-0.00	-0.00*	0.00	-0.00*
Education°								
Other higher degree	-0.90**	-0.35**	-0.46**	-0.35**	-0.90**	-0.35**	-0.46**	-0.35**
A level etc.	-1.03**	-0.44**	-0.61**	-0.44**	-1.03**	-0.43**	-0.60**	-0.43**
GCSE etc.	-1.45**	-0.99**	-0.86**	-0.99**	-1.47**	-1.00**	-0.88**	-1.00**
Other qualification	-1.62**	-0.94**	-1.12**	-0.94**	-1.63**	-0.93**	-1.14**	-0.93**
No qualification	-2.04**	-0.98**	-1.30**	-0.98**	-2.06**	-0.97**	-1.31**	-0.97**
Gender (male)	0.82**	-0.33**	-0.11**	-0.33**	0.83**	-0.33**	-0.10**	-0.33**
Constant	5.38**	1.97**	6.57**	1.96**	5.31**	1.97**	6.50**	1.97**
Direct / Indirect effect	-0.333 / -0.026		-0.333 / -0.201**		0.052 / -0.037		-0.526 / -0.185**	
p (indirect effect)	0.456		0.000		0.289		0.000	
% mediated	7 %		38 %		8 %		26 %	

Notes: DV=dependent variable; ° Reference category for Education is "Degree"; *p<0.05, **p<0.01.