

## Personality and Political Participation: The Mediation Hypothesis

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**Abstract** Recent analyses have demonstrated that personality affects political behavior. According to the mediation hypothesis, the effect of personality on political participation is mediated by classical predictors, such as political interest, internal efficacy, political discussion, or the sense that voting is a civic duty. This paper outlines various paths that link personality traits to two participatory activities: voter turnout in European Parliament elections and participation in protest actions. The hypotheses are tested with data from a large, nationally representative, face-to-face survey of the Spanish population conducted before and after the 2009 European Parliament elections using log-linear path models that are well suited to study indirect relationships. The results clearly confirm that the effects of personality traits on voter turnout and protest participation are sizeable but indirect. They are mediated by attitudinal predictors.

**Keywords** Personality · Voter turnout · Protest participation · Political psychology · Path models

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## Introduction

Personality is one significant source of individual differences in the way individuals interact with their environments and it affects numerous life outcomes, among which, one might suspect, is political behavior. In fact, considerable attention was devoted to the influence of personality on politics in early political science research (McClosky 1958; Sniderman 1975; Lane 1955; Levinson 1958; Milbrath 1965). Recently various studies have revealed important impacts of personality traits, as measured by the Big Five model, on various aspects of political behavior (Mondak and Halperin 2008; Mondak et al. 2010, 2011; Gerber et al. 2011; Mondak 2010) and on political ideology, attitudes and discussion (Gerber et al. 2010; Hibbing et al. 2011). Other studies have shown that lower level psychological characteristics such as shyness, aggressivity or conflict avoidance influence voter turnout (Denny and Doyle 2008; Blais and Labbe-St-Vincent 2011). Altogether, these recent studies suggest that psychological variables are as important as sociological, economic or political ones to understand participation in politics.

The mechanisms through which personality operates to affect political behavior are less clear. As a recent article points out, “effort is needed to strengthen theories regarding the possible political significance of personality” (Mondak et al. 2010, p. 20). These authors further suggest that personality can be expected to influence political activity through its effect on other intermediary factors and by interaction with individual and contextual characteristics. Building on this idea, Blais and Labbe-St-Vincent (2011) have formulated the mediation hypothesis, which claims that the effect of personality is mostly indirect: it is mediated by classical attitudinal predictors of participation. They focus on voter turnout and show that four lower order personality variables affect the acquisition of civic duty and political preferences, the two most proximate predictors of voter turnout. However, they do not use the widely accepted Big Five framework and their analysis does not directly assess the hypothesized indirect pathways.

In this paper we develop the mediation hypothesis theoretically and test it empirically. We argue that personality affects participation indirectly because it shapes the propensity to acquire attitudes and behaviors which in turn are predictors of participation. The mechanisms that mediate the effect of personality traits on political behavior are outlined in detail and the theory is tested with data from an election study conducted in Spain using latent class log-linear path models (Hagenaars 1993; Hagenaars and McCutcheon 2002). This approach is superior to the regular regression framework to estimate complex relationships because it allows us to explicitly study direct and indirect effects, while controlling for variables that cause spurious relationships. Therefore, it is particularly well-suited for this research question.

By focusing on two very different forms of political participation, we show that the effects of personality traits are mode-specific. Voter turnout is the most important participatory activity, and we examine turnout in the European Parliament (EP) elections, a second order election in which there is maximum variation in the decision to turn out to vote. Protest participation is an increasingly popular and widespread way of influencing politics in advanced industrial democracies

(Van Aelst and Walgrave 2001). Spain is an appropriate setting to study the impact of personality on protest participation because this activity is not marginal but among the most frequent political activities.

The paper proceeds as follows. In the first section, the theoretical model is developed and the predictions for each personality trait are presented. The characteristics of the data are discussed and an explanation of the methods used follows. In the next section, we first present the results of the analyses for voter turnout in EP elections and then for protest participation. In the final section the implication of the results are discussed.

## Personality and Political Participation

Personality psychologists have now reached a widespread consensus that personality can be summarized by the Big Five personality traits. Extraversion is linked to positive emotionality. Agreeableness describes a prosocial and communal orientation. Conscientiousness implies a high control over impulses and task-and-goal oriented behaviors. Neuroticism, as contrasted with emotional stability, is associated with negative emotionality. Openness to Experience or Intellect is related to having a complex mental and experiential life (John, Naumann and Soto 2008). The same factors can be roughly identified in very different cultures and languages (Allik and McCrae 2004; McCrae and Costa 1997; McCrae et al. 2005; Schmitt et al. 2007; Heine and Buchtel 2009) suggesting that they capture a human universal.

Traits are motivational reaction norms, i.e. endogenous dispositions for specific cognitive processes and behavior, contingent on the environmental situation (Denissen and Penke 2008). For example, neuroticism makes people more sensitive to threats of social exclusion, and openness affects differences in the reward value of engaging in cognitive ability. It is widely accepted that at least half of the individual variance in personality traits is heritable, and some studies have reported heritability levels in excess of 0.60 (Loehlin 1992; Yamagata et al. 2006; Krueger and Johnson 2008; Medland and Hatemi 2009). Personality is important beyond personality theory because it influences a wide range of attitudes and behaviors across an impressive variety of domains (for a review see Ozer and Benet-Martínez 2006).

Recently political scientists have begun to look at their impact on political behavior. The Big Five are related to a wide array of political activities such as voting, participating in local and national politics, contacting politicians or participating in protest activities both in Anglo-Saxon and Latin-American countries (Mondak and Halperin 2008; Mondak et al. 2010, 2011; Gerber et al. 2011; Mondak 2010) and in some cases their effect is just as large as that of classical predictors such as education and income (Gerber et al. 2011).

These studies have assessed the effect of personality in multivariate models controlling for socio-economic and demographic predictors, but rarely for attitudinal predictors. The theoretical framework proposed by Mondak and his colleagues (Mondak et al. 2010) states that the effects of personality on political behavior are likely to be mediated and moderated by other individual and

environmental factors. Recently, Blais and Labbe-St-Vincent (2011) have claimed that four lower order personality traits (altruism, shyness, efficacy and conflict avoidance) affect the acquisition of political preferences and the belief that voting is a civic duty. In turn, these attitudes are proximate causes of voter turnout. After controlling for the effect of duty and preferences there is no direct effect of personality on participation suggesting that the effect is indirect. This is the mediation hypothesis.

If true, the hypothesis that personality effects are indirect widens our understanding of the process that brings some people to participate in politics. It suggests that there is a funnel of causality in which more distant factors such as sex, age, or personality influence political attitudes which are the more proximate causes of behavior. The general intuition is that personality shapes cognitive, emotional, and behavioral responses to a range of daily situations, which influence the acquisition of politically relevant attitudes. For example, when taught about politics or given the choice of reading a newspaper, a person may be excited and interested in the opportunity of learning about a new issue, or conversely, may fail to feel interest. In the long run, individual differences in the reaction to exposure to new information should help to develop the habit of reading newspapers and political interest, which are important predictors of participation. This view is consistent with findings of previous research and with the general framework proposed by Mondak (2010) and Mondak et al. (2010).

In order to test this idea, the specific pathways that link personality to specific attitudes have to be specified. Our starting point is that people participate in politics mostly because of one of the following reasons: they want to express their views on political issues, are interested in politics, have the resources to participate, are mobilized by others, think that they are able to influence political outcomes, or feel that they have a moral duty (Blais 2010; Verba et al. 1995).

The first personality trait considered is conscientiousness. Denny and Doyle (2008) found with data of a British longitudinal panel that hardworking people vote more often, but in the US the trait of conscientiousness has been found to have no effect (Mondak et al. 2010) or a negative effect (Gerber et al. 2011) on turnout. Theoretically, the most plausible mechanism linking conscientiousness to turnout is the norm of civic duty (Mondak et al. 2010). Social norms are socially enforced rules of conduct that operate in three steps. People need to be aware that they exist. Second, norms may or may not be internalized and accepted. Finally, norms are enforced (see Gerber et al. 2008, p. 34). Conscientiousness should play a role in the second step. Conscientious people should be more ready to internalize the norm that voting is a duty and to act accordingly. The link between conscientiousness and norm-abiding behavior is firmly established. In a meta-analysis of the lower-order conscientiousness-related traits that predict health outcomes it was found that conventionality, defined as a propensity to adhere to society's norms, was most strongly related to a healthy life style (Roberts et al. 2005). According to another review of the literature, conscientiousness was strongly correlated with the propensity to adhere to normative adult social roles, such as creating a family, investing in a career, or volunteering (Lodi-Smith and Roberts 2007).

However, not all participatory acts are equally perceived as a civic duty. Arguably, most people do not consider participating in protest activities a civic duty. Conscientiousness has a negative effect on protest in Venezuela and Uruguay (Mondak et al. 2011), presumably because conscientious people are reluctant to engage in activities considered illegitimate. Protest activities are widely accepted and used in Spain. For example, in the 2004–2008 period the right-wing party and the Catholic church organized large demonstrations to protest against some of the socialist party's policies, and demonstrations are routinely held to protest killings by the terrorist group ETA. Therefore, the negative effect of conscientiousness may be limited to illegal protest activities.

Our first hypotheses are that conscientiousness positively affects voter turnout indirectly, by making it more likely to adhere to the idea that voting is a duty (H1) but it should be unrelated or negatively related to protest behavior (H2).

The second personality trait which may affect political behavior is openness to experience. Following politics is certainly not essential for survival in modern democratic societies. As being interested in astronomy, art, or history it can reflect a general interest in learning and be a sign of the breadth and depth of a person's mental life. There is abundant evidence that openness to experience is related to interest in political issues. Interest in current events, engagement in news-seeking activities, and current events knowledge are all predicted by intellectual openness (Hambrick et al. 2008) and openness to experience (Beier and Ackerman 2001). In an experimental study, Wolak and Marcus (2007) found that moves from minimum to maximum values of openness to experience increased the reported desire of learning more about political issues by 30%. Mondak and Halperin (2008) report that openness is strongly associated with political discussion, knowledge, opinionation, and internal efficacy. Openness is one of the main predictors of political efficacy, which entirely mediates the relationship between openness and a composite scale of five political activities (Vecchione and Caprara 2009). In another study, the effect of openness on six out of ten political activities (including turnout) disappears when introducing controls for political knowledge and internal efficacy (Mondak et al. 2010), suggesting that these are mediation mechanisms.

It is hypothesized that the positive effect of openness on voter turnout and protest participation is mediated by interest in politics (H3) and political efficacy (H4).

In the case of participation in European elections, openness to experience may affect turnout by another intermediary mechanism: identification with Europe. People who are more open to experience should be more likely to identify not just with their narrow political community, but also with the wider community of Europeans. Conversely, those who are low in openness may be more inclined to identify with their village or their country. We hypothesize that openness to experience increases turnout in European elections through the mediating mechanism of identification with Europe (H5).

Extraversion is positively related to participation in group-oriented political activities, but while some authors have found that it is unrelated to acts that do not require interaction such as voting or wearing stickers (Mondak and Halperin 2008),

other authors report a strong positive effect of extraversion on voting (Gerber et al. 2011). Thus it is unclear if extraversion is linked to turnout but if so, the exact mechanisms should be outlined. On the other hand, extraversion is a strong predictor of protest participation in Venezuela but not in Uruguay, suggesting that this effect may be context specific (Mondak et al. 2011).

The first likely link between extraversion and participation is through internal political efficacy. The optimistic and confident character of extraverts produces higher levels of general personal efficacy, i.e. the belief that a person can produce desired results by her actions, and internal political efficacy in particular. Indeed, Vecchione and Caprara (2009) find in two studies that political efficacy mediates the relationship between extraversion and political participation.

The second link is through social networks. Mobilization requests that circulate in social networks are particularly important to explain participation in protest activities. Mobilization efforts are targeted at potential protesters and they are crucial to turn them into actual protesters. It is mostly through social networks that people receive information and encouragement to participate in protest activities (Klandermans and Oegema 1987; Kitts 2000; Diani 2004). Extraverts are more likely to be embedded in large social networks and by virtue of their more frequent contact with others they should be more likely to receive information and suggestions to participate in protest activities that flow in networks.

We expect that the positive effect of extraversion on protest participation and voter turnout is mediated by internal efficacy (H6) and, in the case of protest, by political discussion (H7).

The personality trait of agreeableness has also been related to political behavior in various ways, though there are competing contradictory expectations on its impact on political engagement, participation, and voter turnout. Agreeable people participate more in local politics and in such activities as attending meetings, signing petitions or contacting officials (Mondak and Halperin 2008). However, Bekkers (2005) finds that in spite of the fact that people who report having more empathetic concerns are more likely to volunteer in political and non-political organizations, agreeableness does not have an independent effect on volunteering. On the other hand, aggressive people vote more frequently in Britain (Denny and Doyle 2008). The relationship vanishes when controlling for political interest, which suggests that any effects are mediated by a negative relationship between agreeableness and interest in politics. In the US agreeableness is unrelated or weakly and negatively related to voter turnout and political participation (Mondak et al. 2010).

We suggest that the impact of agreeableness is contingent upon the degree of conflict and visibility of the action. Sometimes it is possible to find a policy solution that is beneficial to all members of a community whereas in other occasions there are conflicting interests (Mansbridge 1980). Agreeable people may be happy to participate in common affairs that enhance the well-being of the community but they may want to avoid conflictual situations. As long as voting is secret, this political act is not highly confrontational and visible. Therefore, we don't expect agreeableness to affect voter turnout. On the contrary, protest participation has varying degrees of confrontation and visibility. Arguably illegal protest activities

**Table 1** Summary of hypotheses

Hypothesis	Personality trait	Outcome	Effect	Mediated by
1	Conscientiousness	Turnout	Positive	Civic duty
2	Conscientiousness	Illegal activities	Negative	
3	Openness	Turnout and protest	Positive	Interest in politics
4	Openness	Turnout and protest	Positive	Political efficacy
5	Openness	Turnout in EP elections	Positive	Identification with Europe
6	Extraversion	Turnout and protest	Positive	Political efficacy
7	Extraversion	Protest	Positive	Political discussion
8	Agreeableness	Illegal activities	Negative	

are the most confrontational activity, followed by strikes, attending demonstrations and boycotts. Agreeableness is expected to depress mostly participation in illegal protest (H8).

Finally, there are contradictory or weak expectations when considering the link between the last of the Big Five factors and voter turnout. Neuroticism is mostly related to variables such as ideology, economic evaluation, opinionation, and dogmatism – which could have both positive and negative effects on ideology but not necessarily on turnout or participation itself (Mondak and Halperin 2008). Gerber et al. (2011) report a positive effect of emotional stability on turnout, but it is unclear why this occurs. Mondak et al. (2011) find that neuroticism does not affect protest. Theoretically, there are no obvious links between neuroticism and predictors of participation such as political interest. Thus we do not have specific expectations on how neuroticism affects turnout or protest.

The hypotheses are summarized in Table 1.

## Data

Before and after the European Parliament (EP) elections of 2009, the Spanish Center for Sociological Research conducted a nationwide two-wave panel survey of all persons aged 18 and up. The first wave was conducted between 29 April and 17 May 2009, and the second wave between 11 June and 15 July 2009.<sup>1</sup> Overall in the first wave 4,692 interviews were achieved, in the second wave 3,459 of the respondents to the first wave were interviewed.

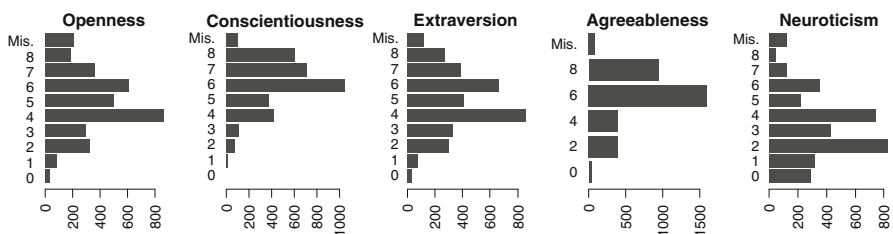
Spain has been a member of the European Union since 1986. The first elections to the European Parliament were held in 1987 and had a record participation of

<sup>1</sup> The sample was stratified to autonomous region and size of municipality. Municipalities were selected randomly as primary sampling units, and from those sections were selected with probability proportional to size. In the final stage a person was selected by performing a random walk through the section with quota on age and sex. The interviews were administered by an interviewer in the person’s home. In the analyses that follow poststratification weights provided by the CIS are always applied. They weight for autonomous region, city size, sex, and age.

70%. In the latest contest celebrated in June 2009 the participation dropped to 46%. According to the four waves of the European Social Survey, between 9 and 17 percent of residents in Spain participate in demonstrations each year. Compared to citizens from Anglo-Saxon countries such as the USA or UK, Spaniards have high levels of political disaffection, they join political protests frequently, but they vote at average levels.

Previous research indicates that the Five Factor model is valid for the Spanish case (Benet-Martinez and John 1998, 2000). In the EP election study the five personality traits were each measured by two items in the questionnaire. The 10 Item Big-Five Inventory (BFI-10) developed by Rammstedt and John (2007) was translated into Spanish by one of the authors and by the staff at the Center for Sociological Research (see original BFI-10 in Appendix). Though a longer version is preferable, the BFI-10 is an adequate instrument to measure personality in survey contexts where brevity is essential. Each trait is measured by two five-item agreement scales. The factor analyses reveal that agreeableness is not properly measured because the agreement scales to the statements “I see myself as someone who is generally trusting” and “I see myself as someone who tends to find fault with others” have low loadings. Factor analysis with covariates known to be related to personality suggest that the first item may not be measuring agreeableness and consequently this item is excluded from the analyses. For the other four factors, the indices RMSEA and SRMR suggest an acceptable fit of the solution with high loadings, and trait scores were calculated by summing the constituent indicators. The distribution of the resulting trait scores, as well as their respective proportions of missing data, are shown as barplots in Fig. 1.

Age and sex are well-known predictors of participation, which are causally prior but related to personality. Most of the change in personality traits and profiles happens before reaching full adulthood and after age 30 there is remarkable stability (Caspi and Roberts 2001; Hampson and Goldberg 2006; Terracciano et al. 2009) with some development as people age: individuals become on average less neurotic and extravert and more conscientious and agreeable (McCrae et al. 2000; Roberts et al. 2006; Terracciano et al. 2005). Men and women also diverge in their personality profiles. Women report on average that they are higher in extroversion, neuroticism, agreeableness, and conscientiousness (Schmitt et al. 2008; Costa et al.



**Fig. 1** Barplots showing the number of categories, distributions, and proportion of missing data for each of the five personality trait scores



2001). In our data, age and sex have the expected relationships with personality traits. Older people are less extravert, neurotic, and open to experience, and more conscientious than young people, and women are slightly more extravert, neurotic and conscientious than men, which confirms that they have to be included as control variables. Education, measured in six categories of completed degrees, is also included as a control variable with the restriction that the relationships with other variables should be monotonic.

Voter turnout in European Parliament elections was measured by a question which provided various alternatives to non-voters in order to minimize the desirability bias. Participation in protest activities was measured by asking whether the respondent had participated in four different protest activities (attending a demonstration, joining a strike, boycotting products for political, environmental, or ethical reasons, and participating in an illegal protest activity). Applying a Mokken scale analysis (Van der Ark 2007) reveals that these items form an excellent hierarchical scale. The scalability coefficient (Loevinger's H) for the scale equals 0.6.

The main predictors of political participation as identified by the previous literature (see Blais 2010 for a recent review) are political interest, internal efficacy, political knowledge, and political discussion. Discussion is particularly important to explain protest, while closeness to a political party and thinking that voting is a civic duty are specific predictors of voter turnout. Identification with Europe should be related to turnout in EP elections. Internal efficacy was measured by four-point agreement scales to the statements “sometimes politics seems so complicated that I can't understand what's going on” and “I am able to understand and judge politics very well”. These two items were incorporated directly into the latent class path model as indicators of a latent class variable. Interest in the campaign was measured before the election with four categories, duty is the personal opinion that voting is either a duty or a right, identification with Europe is measured by an 11-point scale, feeling close to a party is dichotomous, and political discussion is measured with a four-point scale. Political knowledge was measured by asking the respondent whether they could identify five politicians displayed in photographs. A correct answer was scored 1, an incorrect, “don't know”, or missing response was scored 0. A two-parameter logistic IRT model (Rizopoulos 2009) fitted the data suggesting that political knowledge could be measured on a standardized scale. Since the questions were rather difficult, however, low amounts of knowledge were not measured as well. The IRT factor score is the variable used in the analysis.

Since all variables in our model are discrete and many cannot be assumed to be of interval level measurement, we have formulated the conditional relationships as a log-linear latent class path model (Hagenaars 1993; Hagenaars and McCutcheon 2002), in which all variables are treated as discrete, where some are still considered of interval-level and other only of ordinal level measurement (Heinen 1996) (see measurement levels in Appendix).

All variables were treated as discrete and modeled in a log-linear framework. The personality variables, identification with Europe, and the constructed IRT score for political knowledge were assumed to be of interval level. The efficacy indicators

were included directly in the model as ordinal indicators of an underlying latent variable with the same number of classes as its indicators (four). The only restriction placed on the relationship between this latent variable and its indicators was that it should be monotonic (see Croon 1990). The resulting measurement error estimates for these indicators are shown in Appendix. Note that in all cases assumptions about measurement levels are much less strict than they would be in, for example, a linear regression or structural equation model.

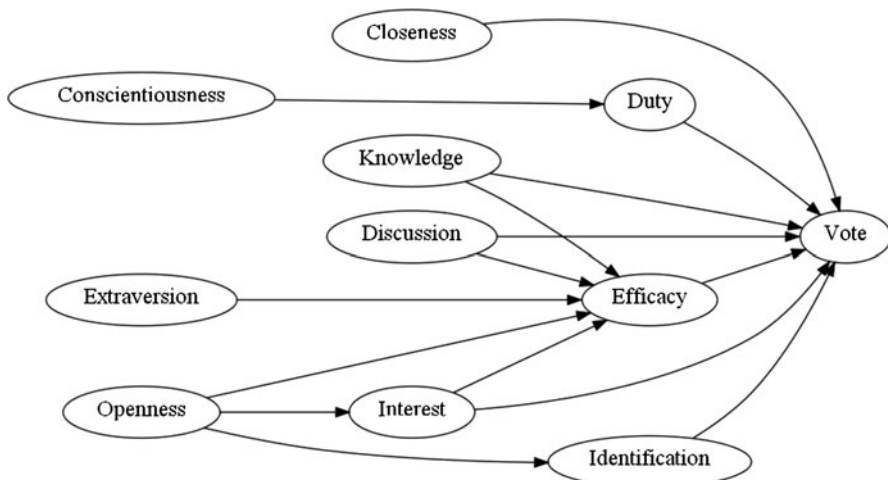
## Methods

The conditional relationships in the model are modeled as log-linear (Goodman 1979; Hageaars 1993). This leads to the logistic equation

$$\ln \frac{\Pr(\text{Vote EU}|z)}{\Pr(\text{No vote EU}|z)} = \alpha + \sum_{p=1}^P \beta_p z_p, \quad (1)$$

where  $z$  is a row of the design matrix of size  $n \times P$ , constructed by combining the effect-coded independent variables of ordinal or nominal level with those of interval level that predict Vote in Fig. 2 and the interactions shown there (Vermunt and Magidson 2005). The log-linear effects  $\beta_p$  indicate the increase in log-odds of voting in the European elections. The intercept  $\alpha$  determines the base level of Spaniards who voted in these elections.

Analogous equations can be constructed for the conditional probability of the belief that voting is a duty, and for the conditional probability of each category of



**Fig. 2** Log-linear direct and indirect effects on voting in the EU elections of 2009. All equations also include an effect of age, gender, and education. These effects have been omitted from the figure for the sake of clarity

the latent variable Efficacy and the observed variable Identification with Europe. These equations are not shown here but can be deduced from Fig. 2.

Each protest behavior was modeled as an indicator of an interval latent class variable ‘Protest participation’,

$$\ln \frac{\Pr(\text{Behavior}_j | \text{Protest} = k)}{\Pr(\text{Not behavior}_j | \text{Protest} = k)} = \alpha_j + \beta_j k, \tag{2}$$

yielding a latent class model for the protest behaviors. The log-odds ratio of belonging to each class of the latent class variable Protest was in turn formulated as a uniform association model (Agresti 2002),

$$\ln \frac{\Pr(\text{Protest} = k | z)}{\Pr(\text{Protest} = k - 1 | z)} = \alpha_k + \sum_{p=1}^P \beta_p z_p. \tag{3}$$

Similar models were formulated for the other (latent) dependent variables in the model. Where necessary, direct effects of the independent variables on the indicators of protest participation were also allowed, modifying Eq. 2 above.

The models were estimated using the program Latent Gold 4.5 (Vermunt and Magidson 2000).<sup>2</sup> We tested restrictions on specific parameters by examining the so-called modification indices (MI). Each MI provides a lower bound on the improvement in the log-likelihood that can be expected if the parameter were to be freed (Buse 1982; Vermunt and Magidson 2005). Since this improvement is asymptotically  $\chi^2$  distributed with 1 degree of freedom, indices above 4 indicate a misspecification in the model ( $\alpha \approx 0.05$ ). Non-nested competing models were compared using the Bayesian Information Criterion (BIC) (Raftery 1995).

Mediation in the latent class path models is specified explicitly in the formulation of simultaneous equations. The model thus directly specifies the multiple-step funnel of causality. Mediation hypotheses were tested directly by first specifying a model with only indirect effects of the traits, and then examining the residual two-way relationships between voting and the personality traits. If the modification indices for these residuals were larger than 3.8, the hypothesis of full mediation was rejected.

## Results

In this section we discuss in turn the results of the log-linear path analysis of voting in the 2009 European Parliament elections, and of participation in different protest behaviors.

<sup>2</sup> Missing data were dealt with by the full-information maximum likelihood estimator employed by Latent Gold under the assumption of missing at random (MAR). Estimation proceeded by EM iterations, after which the algorithm switched to Newton–Raphson until convergence was attained. Before iterations, 10 random sets of starting values were generated and iterated by EM. From these 10 resulting estimates the set with the highest likelihood was chosen as a starting point for iterations.

## Analysis 1: Voting in the European Elections

We examined the two-way relationships between the trait scores and voting for non log-linearity by relaxing the assumption of interval-level measurement to nominal-level measurement and comparing the models with interval-level trait variables with models in which the trait variables had nominal level using the BIC. It was found that the relationship with voting could safely be assumed log-linear with the clear exception of openness. We therefore relaxed the assumption of interval-level measurement for this variable. This means that for each level of the variable openness, a separate loglinear effect is estimated (with the restriction that the coefficients must sum to zero). Thus, for the 11 categories of openness there are 11 loglinear effects. The statistical significance of the effect of openness as a whole can be tested using the Wald test.

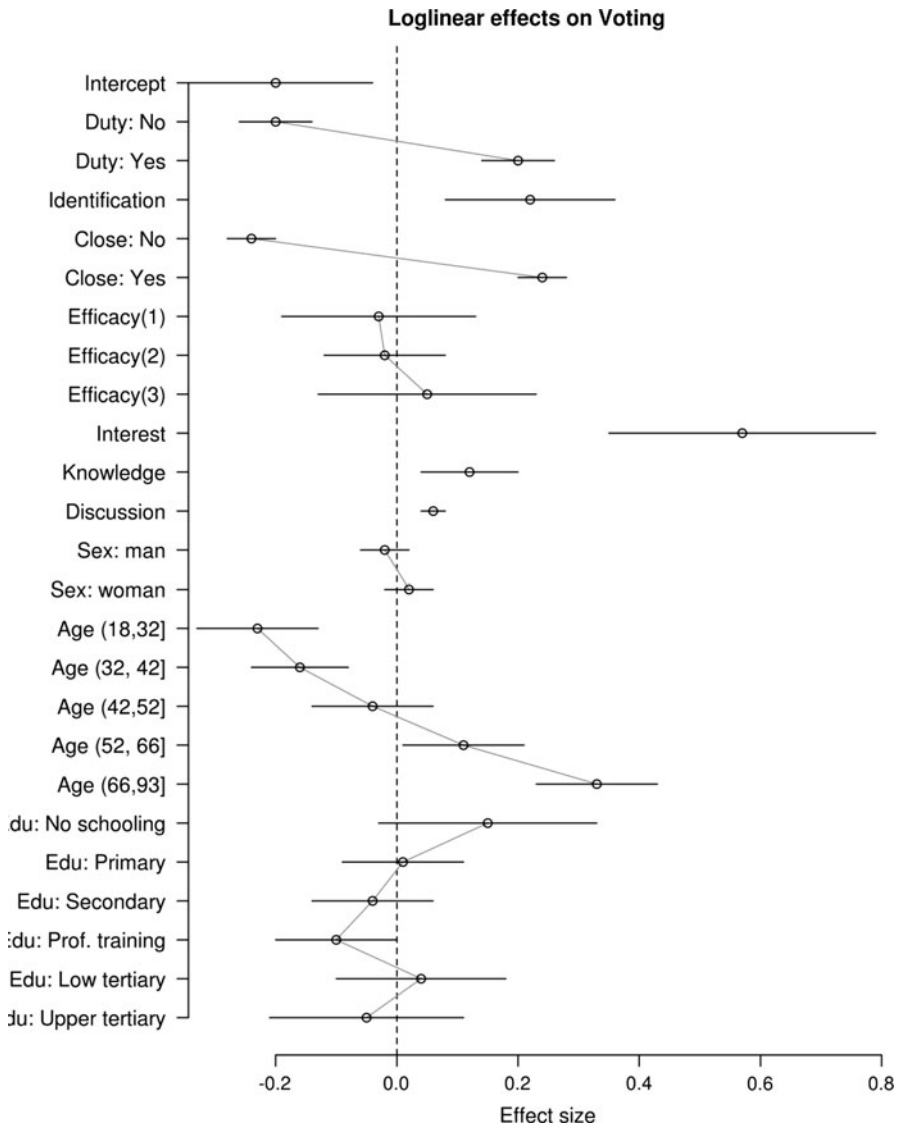
In the first instance the log-linear path model was estimated without including any of the direct effects of personality, interest, knowledge, and discussion on the vote. We then examined the so-called modification indices of these restricted effects. The modification indices of the basic model indicate that there are several misspecifications: political discussion ( $MI = 30.8$ ) and political knowledge ( $MI = 11.3$ ) have a direct effect on voting. For extraversion, conscientiousness, neuroticism, openness, and agreeableness, no significant misspecifications were found. Thus, the effects of extraversion, conscientiousness, and openness are fully mediated by internal efficacy, sense of duty, interest, and identification with Europe. Neuroticism and agreeableness showed no effect, direct or indirect, on voting. Considering these findings we introduced the effects of discussion and knowledge on voting. After these improvements no further misspecifications were found.

The final path model is displayed in Fig. 2 and the direct effects estimates in the equation for voting are shown as a coefficient plot in Fig. 3.<sup>3</sup> To save space we will show only the coefficients for the voting equation. The coefficient plot shows the estimate of the logistic coefficient, together with a confidence interval corresponding to two standard errors. Non-interval variables have a coefficient for each one of their categories, which we have connected with a gray line.

In the regression of voting, age has a significant direct effect, but education and sex do not. They affect turnout indirectly through their effects on duty, efficacy, and identification with the EU. Identification with the EU has a moderate effect on voting. In line with the linear-by-linear specification of the effect of identification, the log-linear effect will equal the coefficient of identification times the score, i.e.  $0.22 \times \text{identification}$ .

Sense of duty also has a moderate effect on voting. Collapsed over categories of the other variables, this effect turns out to be quite important as the marginal probability of voting for people who consider voting a duty is 0.77 (SE 0.01), versus 0.61 (SE 0.01) for those who do not. Interest before the elections has a rather strong effect on voting of 0.57 for each category increase in the latent Interest variable. This corresponds to marginal probabilities in the lowest category of interest of 0.45,

<sup>3</sup> The full estimates and the Latent Gold output are available as an Online Appendix given under Supplementary material.



**Fig. 3** Loglinear effects on voting. For each independent variable, the loglinear effect estimate is shown as a circle. The black lines indicate two standard error intervals around these estimates. Estimates for categories of the same variable have been connected with a gray line for ease of reading. The dotted line shows zero

versus a 0.81 probability of voting in the highest category of interest. Internal efficacy shows a highly nonlinear relationship with voting probability: on average, only people in the highest category are more likely to vote, while having low or moderate amounts of efficacy are equally detrimental.

Political knowledge and discussion both affect voting directly and significantly, as indicated by the modification indices in our earlier restricted model. The effect of

knowledge is potentially sizeable, with marginal probabilities between 0.6 and 0.8. The great majority of people, however, have a low score on the knowledge variable: more than half have a score below zero and more than 75% a score below 0.5. This means that for more than half the sample the maximum marginal effect is 0.04, and for more than 75% it is 0.11. The size of the effect for political discussion, although it may appear small, can attain quite high values for the minority of people who have high scores on this variable; 25% of the respondents had a score between 5 and 12 on this variable, suggesting that their odds of voting are increased by between 140 and 230%. The great majority of people (75%) are below these levels, however; for them the maximum odds ratio increase is 130%.

None of the personality traits affect the probability of voting directly, but, as expected, the relationship of conscientiousness, extraversion, and openness with voting is completely mediated by the other dependent variables in the model.

More conscientious people are more likely to believe voting is a duty. Duty, in turn has a positive effect on the probability of voting. Conscientiousness therefore affects voting and this relationship is fully mediated by the sense of duty which confirms H1.

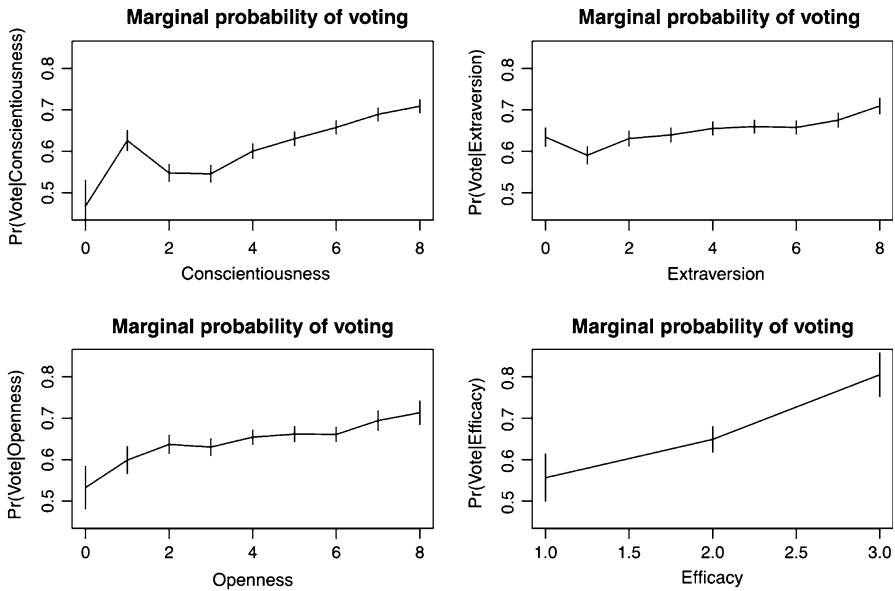
Openness significantly affects interest, efficacy and identification with Europe. While high levels of these variables have a positive influence on voter turnout, openness has no direct effect on voting. Its effects are thus fully mediated by these three variables, clearly confirming H3, H4 and H5.

In line with our expectations, extraversion does affect voting through its substantial main effect (0.27 for the highest category) on internal efficacy confirming H5. Extraverts are more likely to have the high levels of internal efficacy necessary to increase the odds of voting.

Aside from the interpretation in terms of odds ratios another measure of the effect size is the marginal probability of voting as a function of a predictor. Such a measure has the advantage that it shows not just the direct effect of the predictors, but the total effect, that is, it also takes into account the indirect effects the personality traits have, while still controlling for the covariates of the model. Figure 4 shows the marginal probabilities of voting in the 2002 European Elections as a function of the three traits that were found to have any effect, direct or indirect, on voting. To provide a comparison of effect sizes the well-known predictor political efficacy is also plotted.

As with all nonlinear models, the absolute probability, and therefore the relationship it has with a predictor, depends on all the other variables in the model. The plots in Fig. 4 can be seen as average marginal effects, however it may well be that there are people for whom these relationships are much stronger or weaker, due to their score on other variables (for a discussion, see also Berry et al. 2010).

All effects of the personality traits are fully mediated by the other variables in the model. In spite of this, the figure shows that extraversion, conscientiousness and openness all have important and statistically significant indirect effects on voting. The magnitude of these effects can be considered sizeable. A variable with a clear and well-documented effect on internal political efficacy for example, has a somewhat larger effect. Another analysis (not shown) reveals that the total effect of



**Fig. 4** Marginalized conditional probabilities of voting, given the three personality traits that have direct or indirect effects. The effect of efficacy is also shown to provide a comparison of effect sizes. These ‘total effects’ show average probability curves and 2 SE error bars, controlling for covariates

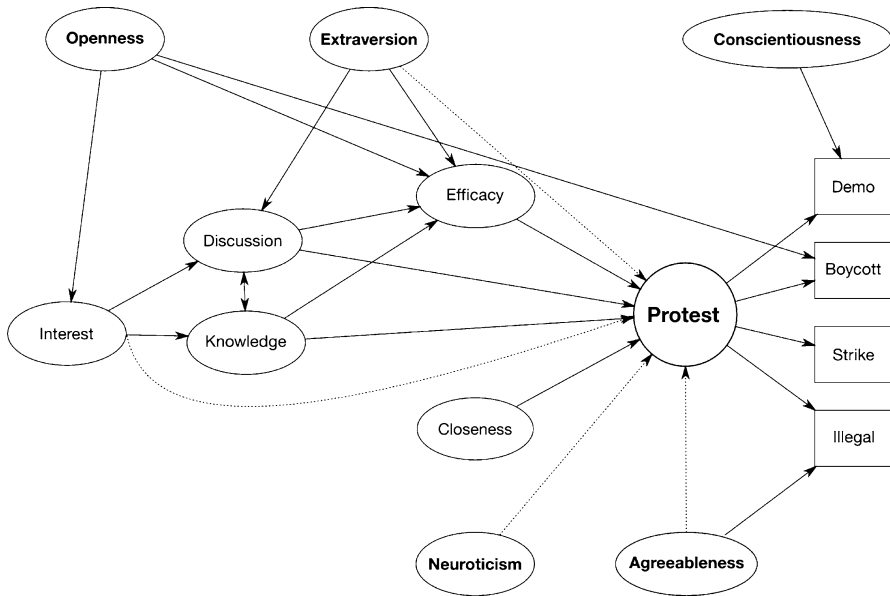
each personality trait is about two-thirds the size of the effect of age, which is one of the strongest predictors of voter turnout.

### Protest Participation

Log-linear equations as discussed earlier were formulated to examine the effects of socio-demo-graphics, personality traits and political attitudes and behaviors on political protest and the model was estimated in the same manner. Figure 5 displays the significant direct and indirect effects of the protest participation model. Figure 6 displays the direct effects estimates in a coefficient plot and the full output is available in the Online Appendix given under Supplementary material.

Openness has a direct effect on participating in a boycott, but not on participating in protest activities in general. It does affect protest through its effects on interest (0.31) and efficacy (between  $-0.35$  and  $+0.46$ ). These variables in turn have a strong effect on protest. Especially efficacy is an important explanatory variable with effects ranging between  $-1.7$  and  $+2.35$ . Such a range indicates a 56-fold increase in the odds of one category of protest versus the previous category; clearly a potentially very large shift. Thus the hypotheses that the effect of openness on protest is mediated by interest (H2) and efficacy (H3) are supported, with a direct relationship between boycott activities and openness.

Agreeableness has a non-significant negative direct effect on protest participation in general. However, it was hypothesized that agreeableness would be more strongly



**Fig. 5** Log-linear path model for protest participation. Not shown for clarity are the control variables age, gender, and education which were included in every equation. *Dotted paths* indicate non-significant effects

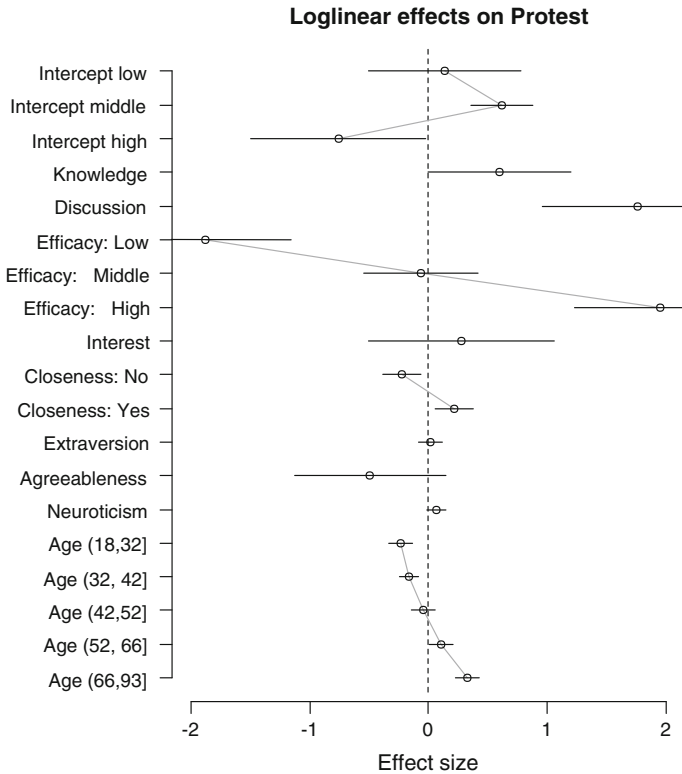
related to illegal protest than to the other protest activities. Examining the modification indices for bivariate relationships between agreeableness and the four protest activities, the following is found:

	Demonstration	Boycott	Strike	Illegal
Direct effect of agreeableness, $\chi^2$ (1 df)	0.10	0.80	0.04	10.93

Since a modification index of approximately 4 or higher is statistically significant at the 0.05 level, it is clear that agreeableness has a direct relationship with illegal activities that is much stronger than that with other protest activities; thus H8 is confirmed. The direct effect of agreeableness on participation in illegal activities over the whole range of its scale corresponds to a potential 43% decrease in the odds ratio of participating.

As with voting, extraversion does not significantly affect protest directly. Extraversion does, however, affect discussion and efficacy. Thus the effect of extraversion on protest is fully mediated by internal efficacy and discussion of politics, confirming H6 and H7. Since the effect of efficacy is much stronger for protest than for voting, the indirect impact extraversion has on protest will also be larger.





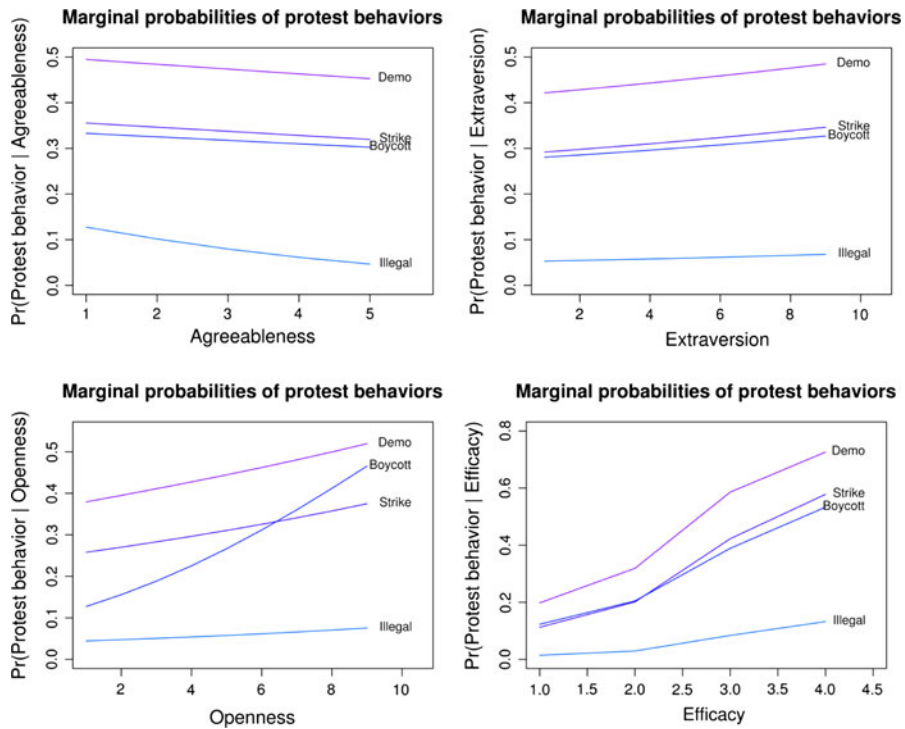
**Fig. 6** Loglinear effects on protest. For each independent variable, the loglinear effect estimate is shown as a circle. The black lines indicate two standard error intervals around these estimates. Estimates for categories of the same variable have been connected with a gray line for ease of reading. The dotted line shows zero

Neuroticism was not found to have any effect on protest participation.

For conscientiousness, no effect or a negative effect on illegal protest participation was hypothesized. We found no relationship with the general protest variable. However, there is an unexpected significant modification index for the bivariate relationship between conscientiousness and participating in demonstrations. After introducing this relationship into the model the log-linear effect is  $-0.07$ .

Figure 7 provides the graph of the marginal conditional probability of each protest activity given the personality traits, representing a ‘total’ effect of the traits (Vermunt and Magidson 2005, p. 69) for the three personality traits for which we found a direct or indirect effect. For comparison, the same graph is also shown for the independent variable with the greatest explanatory power, efficacy. It should be remembered, however, that the effects of the personality traits on the probabilities also operate by increasing Efficacy.

It can be seen that agreeableness has very little effect on demonstrations, boycotts, or strikes, but that the probability of engaging in illegal activities is



**Fig. 7** Conditional marginal probabilities of the four different protest behaviors as a function of the three traits that have an effect. The effect of the classical explanatory variable Efficacy is shown as well for comparison (note the difference in scales). The probability increases shown may operate directly or indirectly through their effect on another variable

considerably lower for those with an agreeable personality, confirming H7. If the decrease appears small in absolute value, it should be remembered that illegal activities are very rare in the first place. Thus the 0.13 probability of participating in illegal activities for people lacking agreeableness is exceptional compared with the average 0.07.

Extraversion does not have a direct effect on any of the protest activities or on the latent Protest variable. However, it does affect discussion and efficacy, and it can be seen that this indeed causes the probability of protest activities to increase. However, the activities that have a low incidence are less affected than higher-incidence activities, as is to be expected in any logit model.

Openness has a stronger effect on efficacy than extraversion and this is reflected in its greater influence on the different protest activities. It is clear that, averaging over the control variables, openness has the strongest total effect on protest activities of all personality traits. Furthermore, openness particularly increases the probability of participating in a boycott. In fact, overall openness has a rather strong marginal effect on boycott activities, increasing the probability of this activity on the average from 0.13 to 0.50.

Another interesting consequence of this effect is that it causes the lines of Boycott and Strike to cross: where in other circumstances there is always a demonstration > strike > boycott > illegal protest hierarchy, the ordering of strike and boycott are reversed for open people, causing a violation in the assumptions of the Mokken scale. This does not affect our analysis, however, because we did not impose any such assumption in the model.

The effect of the efficacy variable is also graphed, in order to put the size of the total effects of the personality traits into some perspective. Noting that the scale of this graph is different from that of the other three graphs, it is clear that this classical variable has a much stronger effect on protest activity than any of the personality traits.

## Conclusions and Discussion

This paper has contributed towards advancing in the understanding of how personality affects political behavior, by focusing on two forms of participation and developing theory which is grounded in both what we know about personality and about political participation.

It has been proposed that the effects of personality are fully mediated by the core predictors of participation identified by previous research, such as political interest, internal efficacy and the like. Indeed, this is clearly the case. We have shown that the effect of conscientiousness on voter turnout is fully mediated by duty; the effect of extraversion on voter turnout is mediated by internal efficacy, and by political discussion in the case of protest; and the effect of openness on participation is mediated by political interest and internal efficacy while in the case of turnout it is also mediated by identification with Europe. In short, all the predicted indirect relationships were supported. In addition, agreeableness only has a negative effect on participation in activities that imply confrontation, such as illegal protest.

In spite of being indirect, the effects of personality traits on political participation are not negligible in magnitude. The total effects of the examined traits have at least half the size of some of the stronger and better established predictors of political participation such as internal political efficacy or age. Personality is thus important to understand why some people participate in politics while others do not.

The idea that personality affects participation indirectly makes it particularly necessary to carefully outline theoretically grounded expectations on what is the exact link between each personality trait, each predictor of participation, and each participation activity. Using appropriate models and sensible specifications is crucial to estimate the effect of personality on political behavior. If, as we argue, the relationships are mostly indirect, in a typical regression framework the results are susceptible to change dramatically depending on the exact model specification: if no intermediary mechanisms are controlled the effects of personality traits will be visible (but underestimated), if the intermediary mechanisms are included, the

effects will disappear. Any of these situations can lead researchers to erroneously conclude that personality is unrelated to political participation. The log-linear path model approach adopted in this paper allows researchers to model complex relationships that include direct, indirect and conditional effects, with variables measured at different levels. Such an approach, widely used in psychological studies, is superior to model complex relationships between variables as suggested by the theory.

One limitation of this study is that only data from Spain were available, and we have only looked at European elections, which are less salient than the national elections. Replications of these findings in different countries and with national elections are therefore necessary. Some of the unexpected findings, such as the null effect of conscientiousness on protest may be specific to the Spanish case due to the fact that protest is widely practiced by all types of political actors in Spain. Further research should look at the generalizability of the findings.

Another limitation is that in the model specification of sense of duty and efficacy as being causally prior to political participation, we have relied on the prevalent theories of political participation. An alternative possibility is that the relationship between voting and sense of duty may be reciprocal. The data themselves, being cross-sectional, do not allow for a direct test of the direction of causality. Although our assumption that attitudes antecede behavior is coherent with the literature, future studies might disentangle this relationship using panel data. There is certainly room for improvement in the quality of some indicators. We did not have direct measures of mobilization and the effect of resources was only measured by education and age. In particular, personality can be expected to influence the likelihood of being mobilized politically, an idea which we attempted to address by examining the effect of extraversion on political discussion. Examining the relationship between personality and direct measures of mobilization would certainly be a superior approach.

The research on the effects of personality on political participation is important because it widens the scope of the explanations of participation to include factors that can be assumed due to theoretical reasons to be prior to political attitudes. It is plausible to conclude from our findings that there is a multiple-step funnel of causality in which personality, socio-demographics and possibly other factors influence political attitudes, which in turn are the most proximate causes that affect political behavior. Such a funnel of causality approach can be adopted to study the impact of other predictors of participation such as genetics or, by including interactive effects, contextual features.

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**Appendix: Question Wording of English Original Ten-Item Big Five Inventory (BFI-10)**

Personality (BFI-10)

I see myself as someone who

- ... is reserved
- ... is generally trusting
- ... tends to be lazy
- ... is relaxed, handles stress well
- ... has few artistic interests
- ... is outgoing, sociable
- ... tends to find fault with others
- ... does a thorough job
- ... gets nervous easily
- ... has an active imagination

- Disagree strongly (0)
- Disagree a little (1)
- Neither agree nor disagree (2)
- Agree a little (3)
- Agree strongly (4)

See Tables 2, 3, 4, 5 and 6.

**Table 2** Variables used in the study and their assumed measurement levels

Variable	# categories	Measurement level	Distribution
<i>Observed variables</i>			
Openness, agreeableness, extraversion, neuroticism, conscientiousness	9	Interval	Discrete
Vote in EP elections	2	Nominal monotonic	Discrete
Demonstration, strike, boycott, illegal	2	Nominal monotonic	Discrete
Identification with EU (11pt scale)	11	Interval	Discrete
Correct answers knowledge quest (IRT)	2	Nominal monotonic	Discrete
Efficacy indicators	4	Nominal monotonic	Discrete
Interest in EU news, interest in campaign	4	Interval	Discrete
Discussion with friends, family	4	Nominal monotonic	Discrete
Age in quintiles, education level, sex	5, 6, 2	Nominal	Discrete
<i>Latent variables</i>			
Protest	4	Interval	Discrete
Interest	4	Interval	Discrete
Efficacy	4	Nominal monotonic	Discrete

**Table 2** continued

Variable	# categories	Measurement level	Distribution
Knowledge	4	Interval	Discrete
Discussion	3	Interval	Discrete

**Table 3** Conditional probabilities of choosing each category of the two observed indicators of efficacy, given the latent variable

Category		Efficacy latent variable			
		1	2	3	4
Indicator 1	1	<b>0.64</b>	0.17	0.02	0.01
	2	0.32	<b>0.74</b>	0.17	0.12
	3	0.03	0.08	<b>0.69</b>	<b>0.48</b>
	4	0.01	0.01	0.13	0.39
Indicator 2	1	0.00	0.01	0.02	0.17
	2	0.01	0.10	0.13	<b>0.70</b>
	3	0.06	<b>0.60</b>	<b>0.74</b>	0.11
	4	<b>0.93</b>	0.29	0.12	0.02

Pseudo  $R^2$  is 0.42 for both variables. Probabilities for the modal categories are shown in bold face

**Table 4** Measurement of protest participation

		Protest participation, latent class variable			
		1	2	3	4
<i>Demonstration</i>					
No	<b>0.9882</b>	<b>0.8481</b>	0.271	0.0242	
Yes	0.0118	0.1519	<b>0.729</b>	<b>0.9758</b>	
<i>Boycott</i>					
No	<b>0.9832</b>	<b>0.9011</b>	<b>0.5869</b>	0.1814	
Yes	0.0168	0.0989	0.4131	<b>0.8186</b>	
<i>Strike</i>					
No	<b>0.9949</b>	<b>0.9386</b>	<b>0.5445</b>	0.0855	
Yes	0.0051	0.0614	0.4555	<b>0.9145</b>	
<i>Illegal protest</i>					
No	<b>0.9998</b>	<b>0.997</b>	<b>0.9647</b>	<b>0.6897</b>	
Yes	0.0002	0.003	0.0353	0.3103	

Relationship between the latent class variable Protest and its four binary indicators. Probabilities for the modal categories are shown in bold face

**Table 5** Loglinear effects of personality traits on predictors of voting

	Identification Eur.			Interest			Duty			Efficacy		
	Coef.	SE	p value	Coef.	SE	p value	Coef.	SE	p value	Coef.	SE	p value
Openness 1	-1.55	0.60	0.003	-1.86	0.71	0.032						
Openness 2	-0.61	0.35		-0.79	0.48							
Openness 3	-0.11	0.18		0.38	0.26							
Openness 4	0.25	0.19		0.17	0.25							
Openness 5	0.36	0.13		0.58	0.18							
Openness 6	0.37	0.16		0.31	0.22							
Openness 7	0.46	0.15		0.20	0.19							
Openness 8	0.54	0.19		0.59	0.28							
Openness 9	0.29	0.25		0.42	0.37							
Conscientiousness							0.05	0.01	0.000			
Extraversion → Effic. 1										-0.15	0.05	0.003
Extraversion → Effic. 2										-0.11	0.04	
Extraversion → Effic. 3										0.27	0.08	
Openness 0 → Effic. 1										1.17	1.69	0.000
Openness 0 → Effic. 2										-4.06	3.88	
Openness 0 → Effic. 3										2.90	2.34	
Openness 1 → Effic. 1										0.51	0.58	
Openness 1 → Effic. 2										0.70	0.83	
Openness 1 → Effic. 3										-1.21	1.17	
Openness 2 → Effic. 1										0.63	0.55	
Openness 2 → Effic. 2										0.84	0.57	
Openness 2 → Effic. 3										-1.47	0.91	
Openness 3 → Effic. 1										0.23	0.32	

Table 5 continued

	Identification Eur.			Interest			Duty			Efficacy		
	Coef.	SE	p value	Coef.	SE	p value	Coef.	SE	p value	Coef.	SE	p value
Openness 3 → Effic. 2										0.47	0.57	
Openness 3 → Effic. 3										-0.69	0.50	
Openness 4 → Effic. 1										-0.01	0.26	
Openness 4 → Effic. 2										0.74	0.51	
Openness 4 → Effic. 3										-0.74	0.44	
Openness 5 → Effic. 1										-0.22	0.30	
Openness 5 → Effic. 2										0.82	0.54	
Openness 5 → Effic. 3										-0.59	0.50	
Openness 6 → Effic. 1										-0.26	0.27	
Openness 6 → Effic. 2										0.47	0.51	
Openness 6 → Effic. 3										-0.21	0.39	
Openness 7 → Effic. 1										-0.62	0.35	
Openness 7 → Effic. 2										-0.03	0.50	
Openness 7 → Effic. 3										0.65	0.35	
Openness 8 → Effic. 1										-1.42	0.46	
Openness 8 → Effic. 2										0.06	0.51	
Openness 8 → Effic. 3										1.36	0.38	

The full table and the Latent Gold output are available in Online Appendix given under Supplementary material



**Table 6** Loglinear effects of personality traits on predictors of protest participation

	Interest			Political discussion			Efficacy		
	Coef.	SE	p value	Coef.	SE	p value	Coef.	SE	p value
Openness	0.30	0.05	0.00						
Extraversion	−0.24	0.06	0.00	−0.24	0.06	0.00			
Efficacy 1 ← Openness							−0.39	0.06	0.00
Efficacy 2 ← Openness							−0.07	0.03	
Efficacy 3 ← Openness							−0.01	0.04	
Efficacy 4 ← Openness							0.48	0.06	
Efficacy 1 ← Extraversion							−0.12	0.05	0.00
Efficacy 2 ← Extraversion							−0.09	0.03	
Efficacy 3 ← Extraversion							−0.04	0.03	
Efficacy 4 ← Extraversion							0.25	0.05	

The full table and the Latent Gold output are available in Online Appendix given under Supplementary material

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