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ORIGINAL PAPER

# Big Five Personality Traits and Responses to Persuasive Appeals: Results from Voter Turnout Experiments

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**Abstract** We examine whether Big Five personality traits are associated with heterogeneous responses to commonly used Get-Out-The-Vote (GOTV) appeals in both a survey and a field experiment. The results suggest that Big Five personality traits affect how people respond to the costs and benefits of voting highlighted in GOTV appeals. Our evidence also suggests that one trait—Openness—is associated with broad persuasibility, while others shape responses to particular types of messages. In some cases the conditioning effects of Big Five traits are substantial. For example, in the one-voter households (HHs) included in our field experiment, we find that a mailer that raised the specter of social sanctions increased the likelihood of voting by a statistically greater amount among those scoring high on Openness. The findings constitute an important step forward in understanding how core personality traits shape responses to various aspects of the act of voting.

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Political science research on the effectiveness of voter mobilization strategies and how personality traits affect political participation each offer important, but distinct, approaches to understanding why some people participate in politics while others do not. The first focuses on the relative effectiveness of different persuasive appeals that encourage citizens to vote (e.g., Gerber and Green 2000; Green and Gerber 2008). The second has focused on how core personality traits—often measured using the Big Five traits of Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness—explain differences in turnout and other forms of political participation across individuals (Gallego and Oberski 2012; Gerber et al. 2011b; Mondak 2010; Mondak and Halperin 2008; Mondak et al. 2010, 2011; Vecchione and Caprara 2009). To date these literatures have evolved separately. This paper is an initial attempt to integrate these two literatures and assess the relationship between Big Five traits and responsiveness to appeals to participate in politics. Specifically, we investigate whether Big Five traits moderate subject response to experimentally manipulated Get-Out-The-Vote (GOTV) appeals.

Scholars have suggested that the relationships between Big Five traits and behavioral outcomes can be explained in terms of an interaction between individuals' personality traits and the stimuli they encounter, with a recent article on these traits concluding that a "major goal for future research will be to conduct laboratory studies tracking individuals' actual reactions to specific categories of environmental stimuli" (Denissen and Penke 2008, p. 1298). In this paper we test individuals' reactions to one form of environmental stimuli—GOTV appeals. Our inquiry informs our understanding of how Big Five traits might shape people's susceptibility to these sorts of appeals and, more broadly, the psychological factors that affect how people assess the cost and benefits of participating in politics.

In order to assess the moderating effects of Big Five traits on responses to GOTV appeals we analyze data from two experiments. We fielded a survey experiment using subjects recruited through Amazon.com's Mechanical Turk (MTurk) interface where we randomly assigned subjects either to a control condition or to receive one of three GOTV appeals. We then ask them to indicate their intent to turnout to vote in the 2010 midterm elections. We also conducted a telephone survey of a randomly selected sample of individuals who were included in a previous GOTV field experiment (see Gerber et al. 2008 for the design and results of the original field experiment). For both experiments, subjects completed the Ten-Item Personality Inventory (TIPI: Gosling et al. 2003), allowing us to measure their Big Five traits. The data from the survey and field experiments allow us to test whether individuals' Big Five traits moderated the effects of GOTV appeals on intent to vote and actual turnout, respectively.

We find evidence that Big Five traits are associated with how people respond to experimentally assigned GOTV appeals using both attitudinal (intention to vote measured in the survey experiment) and behavioral (validated turnout measured in

the field experiment) measures. One trait—Openness—appears to be associated with broad persuasibility while others only appear to affect responses to certain types of messages. In some cases the estimated moderating effects are large. For example, using data from the field experiment, we find that a GOTV message designed to persuade recipients to vote by applying social pressure did not significantly affect the likelihood of turning out among individuals low on either Emotional Stability or Openness. However, among people high on these traits, the mailing increased validated turnout by 18 and 21 percentage points, respectively.[1]

Our findings improve our understanding of how core aspects of individuals' personality are linked to how they interact with their political environment. In particular, they constitute a first step toward understanding how personality traits moderate responses to messages that emphasize different costs and benefits of voting. Our findings also contribute to our understanding of the psychology of voter mobilization more generally by demonstrating that the effectiveness of different types of GOTV appeals varies substantially across individuals with different personality profiles. While previous research on the effectiveness of GOTV efforts has generated valuable guidance regarding how to encourage citizens to vote (e.g., Gerber et al. 2008; Green and Gerber 2008), our analysis suggests that the effectiveness of these efforts is not homogeneous. In short, the results we report support the proposition that Big Five traits moderate citizen response to GOTV appeals, and suggest that the associations between core personality traits and political behaviors can, in part, be explained by how Big Five traits shape individuals' responses to the costs and benefits of participation, including those highlighted in the GOTV efforts of candidates and other organizations.

The remainder of the paper proceeds as follows. First, we describe the Big Five in more detail and elaborate on the nature of these traits. Next, we outline our expectations regarding how personality traits may moderate the effectiveness of various GOTV appeals. We then present findings from a survey experiment and a field experiment that allow us to test these expectations. We conclude by discussing the implications and limitations of our findings and proposing several potential avenues for future research.

## The Big Five Personality Traits and Political Participation

Researchers have long noted the influence of people's personality on a variety of political outcomes—from ideology and other political attitudes (e.g., Adorno et al. 1950; Altemeyer 1996; Carney et al. 2008; Eysenck 1954; Jost et al. 2003; McClosky 1958; Sniderman 1975) to voter turnout and other political behaviors (e.g., Blais and Labbé-St-Vincent 2011; Denny and Doyle 2008; Gallego and Oberski 2012; Gerber et al. 2011b; Lane 1955; Levinson 1958; Milbrath 1965; Mondak 2010; Mondak and Halperin 2008; Mondak et al. 2010, 2011; Mussen and Wyszynski 1952; Sniderman 1975; Vecchione and Caprara 2009). Noting the recent

[1] Given the exploratory nature of this initial assessment of the moderating effects of personality, as well as the dangers of multiple comparisons, these results must be interpreted with caution.

trend in psychology to measure personality traits utilizing the Big Five framework (Digman 1990; John et al. 2008; McAdams and Pals 2006), a good deal of recent work linking personality traits to political outcomes has also adopted the Big Five framework (see Gerber et al. 2011a for a review).[2] Our focus in this paper, however, is on the association between the Big Five and one political outcome, turnout. In particular, we focus on how Big Five personality traits moderate the effects of GOTV appeals on voter turnout. Before delving into specific hypotheses about the interaction between the Big Five and responses to GOTV appeals in the next section, in this section we describe the Big Five in more detail, elaborate on the nature of these traits, and briefly summarize prior work linking these traits to turnout.

The Big Five trait taxonomy shares many similarities with other models of personality and interpersonal behavior (e.g., Cattell 1943, 1965; Eysenck 1970, 1986; Guilford 1975; see John et al. 2008 for a comprehensive review, in particular, Table 4.1). Indeed, as one recent review noted, one of the benefits of the Big Five taxonomy is that it "serves an integrative function because it can represent the various and diverse systems of personality description in a common framework" (John et al. 2008, p. 116). In addition, the Big Five appear to "generalize reliably across different types of samples, raters, and methodological variations when comprehensive sets of variables are factored" (John and Srivastava 1999, p. 106), and a growing body of research also finds relationships between these traits and genetic and other physical markers (Bouchard 1997; Canli 2008; DeYoung et al. 2009, 2010; Lesch et al. 1996; Plomin et al. 1990; Van Gestel and Van Broeckhoven 2003). Although the Big Five personality traits are not perfectly stable through the life cycle (Roberts and DelVecchio 2000; Srivastava et al. 2003), they are relatively stable (e.g., Caspi et al. 2005; Costa and McCrae 1992; Gosling et al. 2003). It is important to note that these traits do not offer a complete picture of individuals' personalities (McAdams 1995). People also vary in their attitudes, values, identities and other attributes that are often considered to be components of personality. However, Big Five traits are broader and appear to be more enduring than these other psychological characteristics (McAdams and Pals 2006; McCrae and Costa 1996). Thus, they provide a unique opportunity to examine how elemental and lasting dimensions of individuals' personalities shape political behavior.

The Big Five measure variations in people's dispositions (or, "basic tendencies") and were identified through extensive lexical analysis, under the assumption that "most of the socially relevant and salient personality characteristics have become encoded in the natural language" (John and Srivastava 1999, p. 103). In other words, language has evolved to include an array of words that allow people to effectively express judgments about the enduring individual-level differences in what people are like that are most relevant to social interactions. Lexical analysis

[2] This work is part of a movement across the social sciences to understand how personality affects a wide range of behavioral and attitudinal outcomes. For example, previous work finds that Big Five traits predict a wide array of outcomes, including: health and longevity (Friedman et al. 1993; Goodwin and Friedman 2006; Roberts and Bogg 2004), earnings (Borghans et al. 2008; Mueller and Plug 2006), behavior in economic games (Ben-Ner et al. 2008; Koole et al. 2001), parenting style (Huver et al. 2010), and satisfaction with intimate relationships (Malouff et al. 2010).

involves gathering a set of descriptors that might be used to describe stable aspects of a person's personality. Individuals are then asked to rate how well these words describe themselves or others, and researchers factor analyze these ratings to identify clusters of descriptors that tap the same underlying dimensions of personality (see Allport and Odbert 1936; Cattell 1943 for early attempts at applying the method). Researchers typically find that these descriptors load onto five factors (see John et al. 2008 for a review), although some scholars have found evidence of more (Ashton and Lee 2005; Paunonen and Jackson 2000) or fewer (Blackburn et al. 2004; Musek 2007) factors.

These five dimensions of personality (the Big Five) are Extraversion, Agreeableness, Conscientiousness, Emotional Stability (sometimes referred to by its inverse, Neuroticism), and Openness. According to John et al. (2008, p. 120), the Big Five are conceptually defined as follows:

> Extraversion implies an *energetic approach* to the social and material world and includes traits such as sociability, activity, assertiveness, and positive emotionality… Agreeableness contrasts a *prosocial and communal orientation* toward others with antagonism and includes traits such as altruism, tender-mindedness, trust, and modesty… Conscientiousness describes *socially prescribed impulse* control that facilitates task- and goal-directed behavior, such as thinking before acting, delaying gratification, following norms and rules, and planning, organizing, and prioritizing tasks… [Emotional Stability describes even-temperedness and contrasts] with negative emotionality, such as feeling anxious, nervous, sad, and tense… Openness describes the breadth, depth, originality, and complexity of an individual's *mental and experiential life* (italics in original).

Researchers have identified a number of associations between these five traits and political participation (Gallego and Oberski 2012; Gerber et al. 2011b; Mondak 2010; Mondak and Halperin 2008; Mondak et al. 2010, 2011; Vecchione and Caprara 2009). This work typically explains variation in turnout by positing that Big Five personality traits affect how people respond to the prospective psychological and social costs and benefits associated with voting. In this mode of analysis, the prospect of participating by voting is a stimulus and how people respond to the elements of this stimulus is posited to vary as a function of their Big Five traits.

For example, this research finds that people high on the trait Extraversion are more likely to participate and proposes that this is because people high on Extraversion respond particularly favorably to the potential social benefits of voting and opportunity to advocate for their preferences (Mondak and Halperin 2008; Mondak et al. 2010; Gerber et al. 2011b). The findings regarding the relationship between Conscientiousness and turnout have been mixed, with some work finding a positive, indirect association between this trait and political participation (Gallego and Oberski 2012), and other work finding a negative relationship (Gerber et al. 2011b) or no relationship (Mondak et al. 2010). However, across these studies researchers have framed their expectations and findings in terms of how Conscientiousness affects how people view the costs and benefits of voting. A positive relationship between

Conscientiousness and turnout may be a function of more Conscientious individuals viewing the act of fulfilling a civic duty as particularly rewarding; a negative relationship may be a function of those higher on this trait being reluctant to dedicate time to activities that are unlikely to yield instrumental benefits. Our work extends this line of research by examining how Big Five traits affect individuals' receptivity to voter mobilization messages that highlight different costs and benefits of the act of voting (that may be more or less appealing to people depending on their Big Five trait profile). In the next section of the paper we present our expectations regarding how individuals' Big Five trait profiles are likely to affect their responses to specific voter mobilization messages.

## The Big Five Traits and Responsiveness to Voter Mobilization Messages

Campaign mobilization is an active area of research in political science (see Green and Gerber 2008 for a summary). Most of the work on the effects of campaign mobilization strategies, however, has focused on identifying those persuasive appeals that are, on average, more effective. That is, this work often does not examine the possibility of heterogeneous treatment effects. Because the Big Five personality traits are believed to shape behavior by affecting how people respond to the vast array of stimuli they encounter in the world (Denissen and Penke 2008; McAdams and Pals 2006), they are a promising starting point for understanding individual-level differences in receptivity to voter mobilization efforts.

Examining the interaction between Big Five traits and receptivity to different types of GOTV appeals provides an opportunity to improve our understanding of both why these messages are effective and how personality shapes responses to political stimuli. Whether a persuasive message is effective will depend on its logical coherence (e.g., Petty and Cacioppo 1984) and whether its content (its argument or the specific nature of the appeal) is consonant with the broad outlook, values, or concerns of people with particular dispositions. This implies that people with certain dispositions may be persuaded to change their attitudes or behaviors by messages that others reject.

Economic models of voting behavior often frame individual decisions about whether or not to vote as the consequence of weighing the various costs and benefits of voting (Downs 1957). Because an individual is typically extremely unlikely to prove pivotal in determining the outcome of an election, the instrumental benefits of voting—i.e., the policy benefits that one can expect to reap by casting a vote for a preferred candidate—are normally small. By comparison, the instrumental costs of voting, including taking the time to become informed, register, get to the polls, and cast a ballot, are high. Thus, many scholars explain the decision to bear these costs as driven by psychological and social factors (e.g., Blais 2000; Edlin et al. 2007; Gerber et al. 2008; Riker and Ordeshook 1968). These factors include the satisfaction one garners from fulfilling one's civic duty, the psychological rewards of contributing to a communal good (democracy), or a desire to avoid the social sanctions that may accompany a failure to turnout. Drawing from this work, we posit that the relationships between Big Five traits and turnout, as well as how these

traits moderate responses to attempts to encourage turnout, are a consequence of how individual traits affect how individuals view these costs and benefits.[3]

The present study is not the first to examine how personality characteristics affect persuasibility. Some early work in this area focused on assessing how personality factors like authoritarianism, self-esteem, intelligence, and assertiveness affect persuasibility independent of the content of the message (e.g., Eagly 1981; Hovland et al. 1953, Chap. 2; Hovland and Janis 1959; Janis 1954). Others have examined how variation in the characteristics of the messenger and message, in concert with the characteristics of the recipient of the message, shape the effectiveness of a persuasive appeal (e.g., Hovland et al. 1953). For example, those who score high on measures of authoritarianism are more easily persuaded by messages from authoritative sources, perhaps because they attach greater value to complying with prescriptions from these types of figures (e.g., Centers et al. 1970; Petersen and Dietz 2000). Kelley and Volkart (1952) find evidence that individuals who attach greater value to membership in a group are more resistant to messages designed to persuade the recipient to adopt an attitude that is at odds with the dominant attitude within the group. Other work finds that individuals who score high on Need for Cognition are more resistant to messages designed to alter existing attitudes (Haugtvedt and Petty 1992).[4]

Some existing work has also employed the Big Five framework or traits related to those included in this framework to examine how personality traits shape responses to particular types of (non-political) message content. For example, research suggests that individuals high on Emotional Stability, Openness, and Extraversion respond more favorably to messages that highlight the hedonic benefits (i.e., the pleasure causing potential) of a product or action (Chen and Lee 2008; Matzler et al. 2006). In contrast, those scoring high on Agreeableness and Conscientiousness appear to attach greater weight to assessments of the utilitarian value of a product or action (Chen and Lee 2008). Work examining how dispositional anxiety affects responsiveness to persuasive appeal suggests that the relationship between this trait and persuasibility depends on the characteristics of the appeal. For example, individuals high on anxiety appear to be particularly responsive to messages delivered by attractive messengers (e.g., DeBono and McDermott 1994), but those lower on anxiety are more likely to be persuaded by particularly threatening messages (e.g., Janis and Feshbach 1954).

One of the most consistent findings reported in existing work on how Big Five traits affect responses to persuasive appeals is that people respond particularly favorably to objects and ideas—including brands (e.g., Aaker 1999) and politicians (Caprara et al. 1999)—that they believe share their personality traits. This suggests that variation in individuals' personality traits may affect how they respond to GOTV messages that signal that a certain "type of person" is particularly likely to vote. If so, this pattern of responses may also be understood as stemming from the relationships between Big

[3] While no prior work that we are aware of examines how Big Five traits affect how people respond to GOTV appeals, some previous work on persuasion has examined how the relative emphasis placed on the costs versus the benefits of voting affect political participation (Lavine et al. 1999).

[4] In other work in this vein, Cialdini and Goldstein (2004, p. 559) note that females appear to be more relationship oriented than men and, because they attach greater value to reciprocity, tend to be more responsive to appeals that highlight the importance of responding to the positive behavior of others in kind.

Five traits and how people view the costs and benefits of a given behavior. For example, a message that casts voters as individuals who value fulfilling their civic obligations may be particularly appealing to individuals whose Big Five traits dispose them to attach particular value to participating in and contributing to their community.

In light of this prior work, we now present hypotheses about how individual-level variation in personality traits will affect how people respond to each of the GOTV messages we test. For four of the five Big Five traits, our expectations focus on how personality shapes responses to the costs and benefits of voting highlighted in each message. In contrast, our expectations regarding the moderating effects of Openness stem from our expectation that this trait will be associated with broad persuasibility. We develop these theoretical expectations below, after we present the specific GOTV appeals used in our experiments.

We test three appeals in our survey experiment and one appeal in the field experiment. The first appeal in the survey experiment (which is also tested in slightly different form in the field experiment) is a *social pressure treatment*. It reads,

> As you may know, in many states whether or not people turnout to vote is a matter of public record. In other words, after the election, anyone (your family, friends, co-workers, neighbors, and elected officials) can find out if you voted.

GOTV messages like this typically have large effects compared to other, more common, GOTV messages (Gerber et al. 2008; also see Davenport 2010; Davenport et al. 2010; Gerber et al. 2010; Mann 2010; Panagopoulos 2010). This message emphasizes that others can find out whether one turns out to vote and suggests that not voting may lead to social sanctions or embarrassment.

The second appeal is a *civic duty treatment*. The text of the message reads,

> Why do so many people fail to vote? We've been talking about this problem for years, but it only seems to get worse. The whole point of democracy is that citizens are active participants in government; that we have a voice in government. Your voice starts with your vote. Please fulfill your civic duty and vote in the 2010 congressional elections.

This message, a common tactic used by campaign strategists to encourage people to vote (Green and Gerber 2008), focuses on the notion that failing to turnout involves ignoring a social norm. In this respect, it is similar to the social pressure message, but it emphasizes fulfilling a positive civic duty rather than the prospect of social scorn for failing to do so. It also implicitly highlights the fact that the act of voting is something that people do because they feel obligated to do it, not because they are likely to reap instrumental benefits from the act of voting. It also acknowledges, however, that for many people the power of this civic norm does not appear to be sufficient to motivate them to vote.

The third appeal highlights the possibility that failing to vote could constitute a forgone opportunity to instrumentally affect an election outcome. Thus, we label this the *instrumental benefits treatment*. The text of this message is,

> In the last midterm election, Congressman Joe Courtney won the election in Connecticut's Second District by only 83 votes! This was an occasion where if a

few more people voted, the outcome of the election could have been different. In other words, a different person could have been elected. One Connecticut voter was quoted as saying "I usually vote, but I stayed home for this election. It drives me crazy to think that my vote could have changed the outcome and I just sat at home! It's really frustrating and I feel pretty embarrassed."

The *instrumental benefits treatment* emphasizes that elections are, at times, decided by very few votes. In this way, this appeal may cue thoughts of voting as a minimax strategy (Blais et al. 1995; Ferejohn and Fiorina 1974, 1975) where individuals attempt to minimize the likelihood of experiencing a maximal loss. Variation in personality traits may affect how people respond to the prospect of failing to take advantage of an opportunity to be pivotal in determining an election outcome.[5]

We begin by considering how the trait of Extraversion will moderate the effects of these messages. Individuals scoring higher on Extraversion have a more energetic and assertive approach to the social world. Because individuals high on Extraversion tend to be more self-assured, assertive, and comfortable in social situations, we expect that they will be less receptive to the *social pressure treatment* because they are less concerned about the possibility of negative social sanctions. In contrast, we expect individuals scoring lower on Extraversion to be more responsive to this appeal because the prospect of social discomfort is a particularly salient cost to these individuals. We do not have prior expectations for how this trait will moderate responses to the *civic duty* or *instrumental benefits* appeals.

Next, we consider Agreeableness, which is associated with a preference for altruism and harmonious social relations. We expect that individuals scoring high on Agreeableness will be particularly receptive to the *civic duty treatment*, which frames voting as an act engaged in by people who care about and want to contribute to their community. In contrast, the *social pressure treatment* emphasizes potential individual sanctions associated with not participating, which could have two possible effects. On the one hand, more Agreeable individuals may respond favorably to this appeal because they wish to maintain amicable social relationships. On the other hand, presenting voting as an activity that one engages in to avoid social sanctions, rather than out of an unselfish commitment to the community may repel individuals high on this trait. Given these potentially offsetting concerns, we are uncertain about how Agreeableness will moderate responsiveness to this type of appeal. Finally, we have no expectation for how Agreeableness will moderate the effect of the *instrumental benefits treatment* because it highlights a benefit that is not tied to theoretical understandings of the Agreeableness trait.

Conscientiousness is associated with following rules, but also goal-orientation and achievement-striving—a point highlighted by the finding from previous work that utilitarian considerations are particularly important to individuals high on this trait. As discussed above, findings regarding the relationship between this trait and turnout have been mixed. These conflicting findings may suggest that the appeal of adhering

[5] A similar appeal to the instrumental benefits was administered in at least one field experiment that we are aware of (Enos and Fowler 2012). Our *instrumental benefits treatment* may also conjure other emotions with words such as "crazy" and "embarrassed." We discuss the possible ramifications of such language below, when we discuss specific hypotheses, especially for Emotional Stability.

to a norm of civic duty (Blais 2000) for individuals scoring high on Conscientiousness (Gallego and Oberski 2012), is, at least in some situations, counterbalanced by the fact that in the vast majority of elections the act of voting is extremely unlikely to yield instrumental benefits that would appeal to those high on this trait.

The *social pressure* and *civic duty treatments* each draw attention to reasons for voting that are unrelated to the practical usefulness of casting a ballot. Instead they suggest that voting is something that one does to avoid embarrassment or adhere to a purported norm. Therefore, we expect individuals higher on Conscientiousness to respond less favorably to these treatments than those lower on this trait. Although the *instrumental benefits treatment* suggests that voting may yield instrumental benefits, which may appeal to individuals scoring high on Conscientiousness, it also highlights the fact that, more often than not, an individual's vote is unlikely to determine the outcome of an election. Thus, it presents the act of voting as a behavior akin to buying a lottery ticket—an essentially non-instrumental act where the stakes may be high but the probability of reaping instrumental benefits is vanishingly small. Because of these offsetting possibilities, we are uncertain about the direction of the moderating effect of Conscientiousness on the *instrumental benefits treatment*.

Emotional Stability is a measure of even-temperedness and a tendency not to experience negative emotional states like anxiety and sadness. Consistent with early work on the relationship between anxiety and responsiveness to threatening messages (e.g., Janis and Feshbach 1954), we expect that people higher on Emotional Stability (and lower on traits related to a tendency to experience anxiety and other negative emotional states) will tend to be respond positively to messages that may evoke negative emotions. In contrast, we expect individuals low on this trait to be inclined to reject messages that raise the specter of negative emotional states. Specifically, the *social pressure treatment* may evoke negative emotions by stimulating anxiety and raising the threat of social exclusion. We expect that those higher on Emotional Stability will be more likely to respond by simply changing their behavior or intentions while those low on this trait will by more likely to reject the message as threatening or respond in some other less productive manner (Bolger 1990; Bolger and Schilling 1991; Gunthert et al. 1999). We do not have specific expectations regarding how Emotional Stability will affect responses to the *instrumental benefits treatment*. This is because although the message includes a quote from an individual who reports feeling regret after failing to vote (that he feels "crazy" and "embarrassed"), this message is unlikely to trigger feelings of guilt or anxiety that are most relevant for understanding the responses of those with different levels of Emotional Stability. We also do not expect Emotional Stability to moderate the effect of the *civic duty treatment*.

Finally, those who are high on Openness are characterized by greater breadth and depth of thinking and enjoying engaging with new information and ideas. Because Openness involves a willingness to engage with new information, we expect individuals high on Openness tend to be more amenable to the argument that voting is a civic duty and more willing to consider the potential costs associated with failing to cast a ballot in a close election or those associated with others finding out that they failed to vote. In summary, because we expect individuals higher on Openness to be more inclined to entertain alternative ways of thinking about the costs and benefits of voting, we expect this trait to be associated with receptivity to a broad range of persuasive appeals.

**Table 1** Expected moderating effects of Big Five traits by GOTV appeal

| Big Five traits | Social pressure (survey and field) | Civic duty (survey) | Instrumental benefits (survey) |
|---|---|---|---|
| Extraversion | − | None | None |
| Agreeableness | +/− | + | None |
| Conscientiousness | − | − | +/− |
| Emotional stability | + | None | None |
| Openness | + | + | + |

*Note* Cells are the predicted relationship between the personality trait and responsiveness to each GOTV appeal, with + indicating that individuals high on the trait will respond more favorably to the appeal and − indicating that these individuals will respond less favorably (or unfavorably). +/− indicates uncertainty about the expected direction of the moderating effect

Table 1 summarizes our expectations for how personality will moderate the effectiveness of the GOTV appeals we test here. As is clear from the table, we expect Big Five traits to most consistently moderate responses to the *social pressure treatment*. Before continuing to our analysis it is important to note that, while our hypotheses are informed by both previous work and our understanding of how Big Five traits shape responses to stimuli, the Big Five traits are broad, multi-faceted characteristics (e.g., Costa and McCrae 1992). Similarly, many factors may be involved in the decision to vote and it is not necessarily clear exactly how people interpret messages designed to highlight particular costs or benefits of voting or how Big Five personality traits affect how people interpret and respond to these costs and benefits. Thus, the analysis that follows is novel, and as an inevitable consequence, somewhat exploratory.

## Assessing the Moderating Effects of the Big Five on GOTV Appeals

In order to assess the moderating effects of personality on responses to GOTV appeals we analyzed data from two experiments. The first is a survey experiment fielded in 2010 using subjects recruited through Amazon.com's MTurk interface. In this survey experimental context we randomly assigned subjects to a control condition or to receive one of the three appeals discussed above. Our second analysis uses data from the Gerber et al. (2008) field experiment merged with data we collected about the Big Five traits of participants in that experiment. The advantage of the survey experiment is our ability to test a variety of messages relatively inexpensively. The advantage of the field experiment is that we do not need to rely on (potentially inaccurate) reports of intended participation, but can instead observe that behavior directly from administrative records.

### Results from the Survey Experiment

Participants in the survey experiment were recruited using Amazon.com's MTurk website.[6] Although this subject pool is not nationally representative, as we discuss

[6] The survey was fielded from 24 February 2010 to 1 July 2010. Respondents were paid $0.25 to participate. The text of the MT request read: answer some questions about yourself and your political

below it is substantially more diverse than other commonly used convenience sample populations (e.g., undergraduate students, see Berinsky et al. 2012). Individuals who chose to participate were directed to an online survey and informed consent was obtained. The survey opened with a battery of standard demographic and political questions. (The "Appendix" section includes complete question wording and coding rules for all measures used in our analysis.) Subjects then completed the TIPI as developed by Gosling et al. (2003) to measure the Big Five traits. The TIPI asks respondents to report the extent to which "I see myself as" characterized by a series of 10 trait pairs using a seven-point scale ranging from Disagree Strongly to Agree Strongly. Each Big Five trait is captured by responses to two trait pairs. Responses to these 10 questions are used to score a respondent's personality in each of the Big Five traits. Although the brevity of the TIPI means that it cannot match the reliability of more extensive batteries that include dozens or even hundreds of items, it is ideal in the survey context because its length and speed of administration make it feasible when longer batteries are not. Scores obtained from the TIPI are correlated with those obtained from these longer instruments (Gosling et al. 2003, Tables 6, 9) and show good test–retest and self-other (self-rating vs. ratings provided by a peer) reliabilities.[7]

Each participant was then randomly assigned with equal probability to either receive one of the three treatment appeals presented above or to a control condition where they were not presented with a persuasive message. Next, participants were asked how likely they were to vote in the upcoming (2010) election on a scale ranging from 1 ("I definitely will not vote") to 10 ("I definitely will vote"). We rescaled this variable to range from 0 to 1. We note that self-reports of turnout intent are distinct from actual turnout behavior. However, examining the relationships between the experimental treatments and this outcome measure—as well as how individuals' personality traits moderate these effects—provides a way for us to

Footnote 6 continued
attitudes (RESTRICTED TO UNITED STATES RESIDENTS). Usually takes 2–3 min. You can find the survey here: [URL] Payment is auto-approved in 5 days.

[7] Trait pairs for each trait. Observed correlations in brackets; (R) indicates reverse scoring:
Extraversion: Extraverted, enthusiastic; Reserved, quiet (R) [$r = 0.540$]
Agreeableness: Sympathetic, warm; Critical, quarrelsome (R) [$r = 0.285$]
Conscientiousness: Dependable, self-disciplined; Disorganized, careless (R) [$r = 0.424$]
Emotional Stability: Calm, emotionally stable; Anxious, easily upset (R) [$r = 0.539$]
Openness: Open to new experiences, complex; Conventional, uncreative (R) [$r = 0.288$]
The TIPI was not designed with the intent of achieving high inter-item correlations. Rather, it was designed to (1) be brief; (2) achieve high test–retest reliability (as well as reliability between self- and peer-administered ratings); and (3) yield measures that are highly correlated with those obtained using much longer batteries (the correlations between TIPI measures and the 44-item Big Five Inventory range from 0.65 to 0.87; correlations with measures from the much longer, 240-item NEO PI-R range from 0.56 to 0.68). Therefore, because each question in the TIPI is designed to measure part of a broader Big Five trait, inter-item correlations between the two items used to measure each trait are less informative of the items' reliability (Gosling 2009; more generally, see Kline 2000; Woods and Hampson 2005 on the misleading nature of $\alpha$ calculated on scales with only a small number of items). Test–retest reliabilities of the TIPI measures (re-measured after 6 weeks; Gosling et al. 2003, Table 3): Extraversion = 0.77; Agreeableness = 0.71; Conscientiousness = 0.76; Emotional Stability = 0.70; Openness = 0.62.

assess whether Big Five traits affect how people respond to different types of GOTV appeals.[8]

In order to ensure that this analysis is as comparable as possible to that associated with the field experiment reported below (which examines the effects of persuasive appeals on 2006 primary election turnout among individuals who voted in the 2004 general election), we restrict our sample to the 801 respondents who indicated that they voted in the 2008 general election and provided valid responses for all of the variables used in our analysis. Appendix Table 4 presents summary statistics both for the overall survey sample and for those assigned to each treatment. (Correlations between the Big Five measures are presented in the top half of Appendix Table 5.) Consistent with demographic results reported in Berinsky et al. (2012), this subject population is somewhat younger than the national average (mean age = 32.7) and just under 60 % of the sample is female.[9] Importantly, scores on the TIPI among the MTurk sample are similar to those found in a national sample of Internet respondents, suggesting sampling variability related to the personality characteristics of our respondents is not an acute problem (see Appendix Table 6).[10]

The lower portion of Appendix Table 4 displays the average of the turnout intention variable by condition. The largest average effect of a treatment was for the *civic duty treatment*, which increased intentions to turnout by 0.06 units (approximately 0.24 standard deviations; $p < 0.05$). Neither of the other two appeals significantly affected average turnout intentions ($p > 0.10$). These average treatment effects are small, demonstrating that these messages were on average only weakly persuasive. We are not concerned with the direct effects of these treatments, however. Rather, our theoretical argument is that these direct effects may obscure heterogeneous treatment effects associated with differences in individuals' personality traits. In Table 2 we report analysis where we examine whether the effects of each treatment were shaped by Big Five personality traits.

In column (1) we present results from an OLS regression model where we enter indicators for each treatment (with the control group as the excluded category), the

[8] In an analysis of the associations between Big Five traits and misreporting of turnout, Gerber et al. (2011b) find in a sample of Connecticut residents that less Agreeable individuals are more likely to overreport actual turnout behavior. The authors report no other statistically significant associations between Big Five traits and the misreporting of turnout. These findings suggest that the results of our survey experiment as they pertain to Agreeableness may be biased if less Agreeable people respond that they are more likely to vote as a consequence of the treatment. This same bias, however, is unlikely to be present for the other four traits.

[9] We tested for balance across the treatment conditions using a multinomial logit model with a nominal experimental treatment condition variable as the outcome. Covariates: age, race (separate indicators for Black, Hispanic, and other [non-White]), gender, education, income, and income missing. The covariates were reasonably well balanced ($p = 0.307$, for test of joint significance of all covariates), although there are some differences across treatment groups for age ($p = 0.030$). All subsequent models include all these variables as covariates to minimize our standard errors and address the possibility of heterogeneity across treatment groups.

[10] Although this evidence does not fully allay concerns about sampling bias, it does demonstrate that the personality characteristics of the experimental sample are not drastically different from those of the general public. More generally, however, we note that our estimates are unbiased within our respective samples because we randomize within samples, so sampling variability does not call into question the internal validity of our results.

Big Five measures (rescaled to have a mean of 0 and standard deviation of 1), and interactions between each Big Five trait and each treatment. We also include a series of demographic variables as controls. The coefficients on the interactions between the Big Five traits and treatments are estimates of the extent to which each trait moderated the effect of the treatment. Positive coefficients indicate that the persuasive effects of the treatment were stronger for individuals high on the trait (compared with people low on the trait), while negative coefficients indicate that the

**Table 2** Moderating effects of Big Five traits (survey experiment)

| | (1) Survey experiment: DV = turnout intent, 2010 (0–1) | (2) |
|---|---|---|
| Treatment: social pressure (1 = yes) | −0.008 [0.024] | −0.083 [0.245] |
| Treatment: civic duty (1 = yes) | 0.037 [0.022]* | −0.347 [0.204]* |
| Treatment: instrumental benefits (1 = yes) | −0.001 [0.025] | −0.214 [0.247] |
| Social pressure × Extraversion | −0.046 [0.025]* | −0.052 [0.026]** |
| Social pressure × Agreeableness | −0.060 [0.028]** | −0.053 [0.030]* |
| Social pressure × Conscientiousness | −0.064 [0.029]** | −0.064 [0.029]** |
| Social pressure × Emotional Stability | 0.050 [0.026]* | 0.054 [0.027]** |
| Social pressure × Openness | 0.048 [0.027]* | 0.055 [0.028]** |
| Civic duty × Extraversion | −0.013 [0.023] | −0.016 [0.023] |
| Civic duty × Agreeableness | −0.014 [0.025] | −0.003 [0.026] |
| Civic duty × Conscientiousness | −0.048 [0.022]** | −0.044 [0.022]* |
| Civic duty × Emotional Stability | 0.035 [0.021]* | 0.040 [0.022]* |
| Civic duty × Openness | 0.024 [0.022] | 0.025 [0.022] |
| Instrumental benefits × Extraversion | −0.019 [0.025] | −0.021 [0.026] |
| Instrumental benefits × Agreeableness | −0.043 [0.029] | −0.039 [0.029] |
| Instrumental benefits × Conscientiousness | −0.016 [0.028] | −0.018 [0.030] |
| Instrumental benefits × Emotional Stability | −0.002 [0.028] | 0.013 [0.030] |
| Instrumental benefits × Openness | 0.070 [0.029]** | 0.065 [0.028]** |
| Extraversion (standardized) | 0.031 [0.016]* | 0.032 [0.017]* |
| Agreeableness (standardized) | 0.017 [0.020] | 0.015 [0.021] |
| Conscientiousness (standardized) | 0.036 [0.018]* | 0.034 [0.019]* |
| Emotional Stability (standardized) | −0.006 [0.016] | −0.011 [0.017] |
| Openness (standardized) | −0.018 [0.017] | −0.021 [0.017] |
| Age (in years) | 0.017 [0.005]*** | 0.008 [0.006] |
| $Age^2/100$ | −0.017 [0.007]** | −0.004 [0.007] |
| Black = 1 | 0.034 [0.037] | 0.082 [0.051] |
| Hispanic = 1 | −0.032 [0.041] | 0.031 [0.074] |
| Other race = 1 | −0.032 [0.032] | −0.027 [0.061] |
| Female = 1 | 0.005 [0.018] | −0.002 [0.036] |
| Education (1 = no HS; 6 = post-graduate) | −0.007 [0.007] | −0.012 [0.013] |
| Income (1 ≤ 10k; 14 ≥ 150k; 15 = RF/skipped) | 0.001 [0.003] | 0.000 [0.006] |
| Income missing | −0.019 [0.039] | −0.010 [0.088] |

**Table 2** continued

| | (1) Survey experiment: DV = turnout intent, 2010 (0–1) | (2) |
|---|---|---|
| Constant | 0.495 [0.091]*** | 0.649 [0.125]*** |
| Observations | 801 | 801 |
| Demographics × treatment interactions? | No | Yes |
| $R^2$ | 0.099 | 0.132 |
| Social pressure interactions (Prob >*F*) | 0.004 | 0.008 |
| Duty interactions (Prob >*F*) | 0.225 | 0.200 |
| Instrumental interactions (Prob >*F*) | 0.190 | 0.288 |
| All interactions (Prob >*F*) | 0.047 | 0.088 |

*Note* Results from OLS regression models. Robust standard errors in brackets

*Source* MTurk Study

* Significant at 10 %, ** significant at 5 %, *** significant at 1 % (two-tailed tests)

effects of the treatment were weaker for those high on the trait. The bottom of Table 2 also reports the joint significance of the personality and treatment interactions across all treatments (the bottom row, labeled "All interactions (Prob >*F*)"), as well as separately, the joint significance of the set of five Big Five interactions for each treatment. We note that although the Big Five × treatment interactions significantly improve the fit of the model, in substantive terms, they only modestly improve model fit. Specifically, the addition of the interaction terms increases the adjusted $R^2$ from 0.0455 to 0.0612.

The specification presented in column (2) is a robustness check where we add interactions between each of the messages and each of the demographic covariates included in the column (1) specification. This specification allows us to rule out the possibility that there are heterogeneous treatment effects associated with demographic factors included in our model that we incorrectly attribute to personality because of a correlation between those demographic characteristics and personality traits. We find that the results are robust to including these additional variables. Consequently, we focus our discussion on the column (1) specification.

Across messages and traits, a test of the joint significance of all the personality traits and message interactions is jointly significant at the $p < 0.05$ level, supporting our expectation that Big Five traits would moderate responses to GOTV appeals. The results also suggest that personality traits moderate the effect of some messages more than others. The strongest evidence for a moderating effect of personality is found for the social pressure treatment, where the joint significance of the personality–treatment interactions is statistically significant at the $p < 0.01$ level. The results associated with the social pressure treatment support our expectation that each of the Big Five traits may moderate the effect of this type of appeal.[11]

[11] Another experimental condition that highlighted the conflict often entailed in political debates, but was not explicitly designed to encourage participation, was included as part of this study, but is not reported here. The exclusion of this experimental condition does not materially affect the results we present here. Information is available upon request.

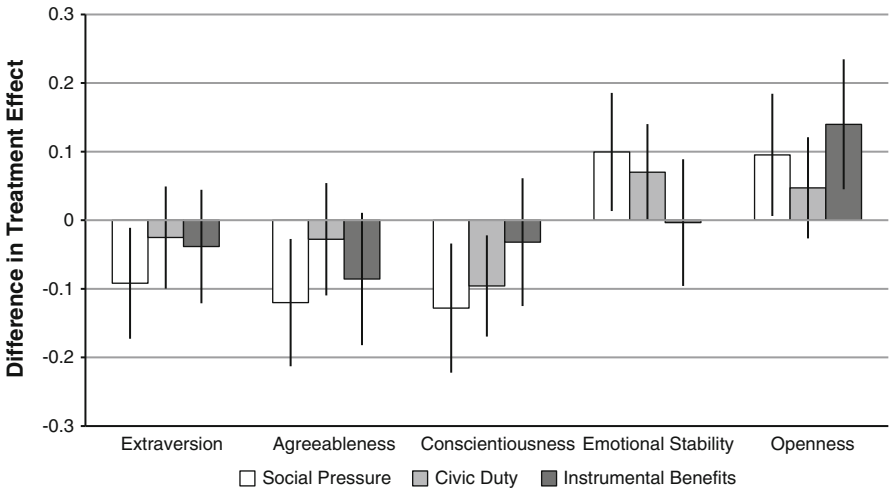


**Fig. 1** Moderating effects of Big Five traits (survey experiment). *Note* Bars indicate estimated differences in treatment effects between individuals scoring high (one standard deviation above the mean) rather than low (one standard deviation below the mean) on each Big Five trait. For example, the white bar on the far left indicates that the treatment effect of the Social Pressure treatment was approximately .09 units smaller among individuals scoring high, rather than low, on Extraversion. Whiskers in the figure are 90% confidence intervals. Esimates based on model presented in Table 2, column (1)

In order to simplify the interpretation of the magnitudes of the personality–treatment interactions, Fig. 1 presents the difference in the estimated effect of each treatment between individuals high (one standard deviation above the mean) rather than low (one standard deviation below the mean) on each Big Five trait. Whiskers in the figure are 90 % confidence intervals. Overall, the results support our expectation that Big Five traits play a role in determining how people respond to persuasive appeals. In many cases, the nature of these effects conforms to our expectations.

First, we posited that, because they tend to be more assertive and, thus, less likely to see the prospect of social sanction as problematic, individuals high on Extraversion would be more resistant to the *social pressure treatment*. Among individuals who were presented with the *social pressure treatment*, those low on Extraversion indicated that, on average, they were 0.038 units more likely to vote in 2010. In contrast, among participants high on Extraversion, this treatment resulted in a 0.054 unit *decrease* in intent to vote. This difference in treatment effects of 0.092 (or approximately 0.38 standard deviations) is reflected in the first bar of Fig. 1. We did not expect Extraversion to moderate responses to the other two appeals. The coefficients on the interactions between Extraversion and each of those treatments are small and statistically insignificant.

Our expectations regarding Agreeableness built on the argument that more Agreeable individuals respond more favorably to appeals based on altruistic and cooperative outcomes rather than on individualistic outcomes. For this reason, we predicted that individuals high on Agreeableness would respond more favorably to the *civic duty treatment*. This prediction is not supported: The interaction of Agreeableness and *civic duty* is near zero and statistically insignificant. We offered no

hypothesis for how Agreeableness would moderate the effect of the *instrumental benefits treatment* and find a statistically insignificant (negative) interactive effect ($p = 0.14$). Finally, our expectations regarding how Agreeableness would moderate the effects of the *social pressure treatment* were mixed because this appeal both suggested voting was a cooperative activity that might be more attractive to those high on Agreeableness and also raised the threat of social sanctions or ostracism for non-compliance that those high on Agreeableness might find unappealing. Our findings suggest that the second component of the message was more consequential, as the coefficient on the interaction term is negative and statistically significant. The effect of this treatment on respondents one standard deviation less Agreeable than average was 0.052 units; for respondents one standard deviation more Agreeable than average the treatment decreased turnout intentions by 0.068 units. The difference in these treatment effects is 0.120 units-almost one half of a standard deviation.[12]

As with Agreeableness, we also expected the moderating effects of Conscientiousness to vary across treatments. We posited that people high on this trait would respond unfavorably to appeals that highlighted the symbolic benefits of voting (i.e., the *social pressure* and *civic duty* appeals). The findings support this expectation. In both cases the coefficient on the interaction between Conscientiousness and the treatment is negative and statistically significant. Comparing those who are one standard deviation more Conscientious than average to those one standard deviation less Conscientious, the effect of the *social pressure treatment* is 0.128 units smaller and the *civic duty treatment* 0.096 units smaller for the more Conscientious. The interaction between the *instrumental benefits treatment* and Conscientiousness is small and indistinguishable from zero. This suggests that the potential material benefits highlighted in this treatment were not enough to engage more Conscientious individuals, nor did the treatment repel them by implying that an individuals' vote only very rarely determines the outcome of an election.

We did not offer expectations regarding how Emotional Stability would moderate the effects of the *civic duty* and *instrumental benefits treatments*. Although the coefficient on the interaction between Emotional Stability and *instrumental benefits* is small and statistically insignificant, the interaction between Emotional Stability and *civic duty* is positive and statistically significant ($p = 0.100$). The effect of this treatment on individuals who are one standard deviation more Emotionally Stable than average was 0.070 units more positive than it was for those one standard deviation less Emotionally Stable than average. In the case of the *social pressure treatment*, we expected those higher on Emotional Stability would respond to the specter of social sanctions by changing their voting behavior or intentions while those scoring lower on this trait would reject the message as threatening. The results support this expectation: a two standard deviation increase in Emotional Stability is associated with a 0.095 unit increase in the size of the effect of the treatment on intent to turnout.

[12] As we note in footnote 8, due to the tendency of less Agreeable individuals to over-report their turnout, these results may be due to measurement error in which these less Agreeable individuals are induced by the treatment to misreport their intended behavior. In the field experiment, where turnout behavior is observed (not reported), the results regarding Agreeableness' interaction with the *social pressure treatment* are directionally consistent with those of the survey experiment, but statistically insignificant.

Finally, we expected that individuals high on Openness would be more readily persuaded by each of the three messages. The pattern of coefficients supports these expectations. Individuals high on Openness responded significantly more favorably to the *social pressure* and *instrumental benefits treatments*. For the *social pressure treatment*, the treatment effect among those high on Openness was 0.095 units more positive than among those low on this trait; for the *instrumental benefits treatment* this difference was 0.140. In the case of the *civic duty treatment* the interaction is also positive, although it does not reach conventional levels of statistical significance ($p = 0.29$).

## Results from the Field Experiment

Next, we report findings from a survey that collected personality information for a subset of respondents who previously participated in a field experiment. The original experiment was conducted prior to the 2006 gubernatorial primary election in Michigan (results of the original field experiment are reported in Gerber et al. 2008). In that study, selected individuals listed on publicly available voter rolls and identified as having a relatively high probability of participating in the primary election (e.g., those whose records indicated they had participated in the 2004 general election) were sent one of four appeals encouraging them to vote.[13] The study found that one appeal that leveraged social pressure, which we describe in greater detail below, was particularly effective. Relative to the control condition, it increased turnout by eight percentage points in the primary election. This is a very large effect relative to those identified in other GOTV mailings (see, for example, Gerber and Green 2000; Green and Gerber 2008). From June 25 to July 6 of 2009, we surveyed by telephone a randomly selected sample of participants identified as living in HHs with either one or two registered voters. These participants were selected from both the control and *social pressure treatment*[14] conditions to measure their underlying personality traits by administering the TIPI.[15] These data allow us

[13] In total, 180,002 HHs were part of the experiment (20,000 of which were randomly selected to receive the "neighbors mailing" described below). This set of HHs was selected from the Michigan voter file based on a variety of factors, the full details of which are reported in Gerber et al. (2008, pp. 36–37). Most notably, everyone for whom there was not a valid nine-digit ZIP on the voter file was excluded, as were people who lived on blocks where many of the addresses (more than 10 %) included apartment numbers and people who lived on streets with fewer than 10 registered voters. In addition, if all members of a HH were estimated to have over a 60 % probability of voting by absentee ballot or of choosing the Democratic primary to participate in, the HH was not sent a mailing.

[14] This treatment is referred to as the "neighbors" treatment in the original study.

[15] As expected, given previous research that finds that Big Five traits are stable over time, post-treatment measurement of these traits does not appear to be problematic. Treatment assignment was not a statistically significant predictor of any of the Big Five traits in either one or two voter HHs, or in the full sample. This suggests that the (political GOTV) treatment did not contaminate responses to the personality questionnaire, a finding that is consistent with recent research that finds that Big Five measures most often included in political surveys, including the TIPI, do not appear to be significantly affected by political events (Gerber et al. 2012). The setup of this study also precludes the possibility that fielding the personality questionnaire contaminates responses to the treatment or vice versa, which is a potential concern with the survey experiment. The survey also included items from psychological batteries designed to measure public self-consciousness, private self-consciousness, and impression

to determine whether individuals' Big Five traits moderated the effectiveness of this GOTV appeal.

One benefit to using this field experiment as the basis for testing whether Big Five personality traits moderate the effects of persuasive appeals is that, in contrast to the survey measures used in the earlier analysis, we are able to measure actual turnout behavior by accessing publicly available voter rolls. These records avoid the potential problems with socially desirable self-reporting that may undermine the measure of vote intent we used in the survey experiment, particularly given our earlier finding about Agreeableness and prior research that less Agreeable individuals overreport their turnout.[16]

In the *social pressure treatment*, recipients were told that after the election the researchers intended to send a record of whether or not the recipient and a selection of their neighbors had voted to both the recipient and their neighbors. The letter included a list of some of the recipients' neighbors, along with information about whether those individuals had voted in the previous two elections (the 2004 general election and the 2004 primary election). The list also included the recipient's name and his or her turnout record for the same two elections (see the "Appendix" section for an example of this mailing.)[17] This message and the *social pressure treatment* used in the survey experiment are substantively similar. Both apply pressure by highlighting the potential social costs of failing to turnout. Given this, our expectations for how Big Five traits will shape responses to the substance of the field experiment treatment mirror those discussed above regarding the conditional effects of the *social pressure treatment* used in the survey experiment (see Table 1).

In the bottom portion of Appendix Table 7 we report the proportion of respondents in our sample (those original experimental participants for whom we obtained valid personality measures via the survey) who turned out in the 2006 primary by treatment condition and find that treated individuals were 8.2 percentage points more likely to turnout. This confirms that, in this subsample, we continue to find large baseline treatment effects. We next examine whether or not personality moderated the effectiveness of this appeal. (Correlations between the Big Five measures are presented in the bottom half of Appendix Table 5.) Results from an OLS regression model with 2006 turnout (as measured using the voter file) as the dependent variable appear in Table 3. This model specification is similar to the one used in our analysis of the survey experiment. We enter measures of the Big Five traits, an indicator for the *social pressure treatment*, and interactions between each Big Five trait and the treatment as independent variables along with a series of

Footnote 15 continued
management (International Personality Item Pool, http://ipip.ori.org/). These psychological characteristics were not significantly associated with differences in the magnitude of the treatment effect.

[16] Appendix Table 7 shows the sample statistics overall and by treatment and control group. Although the variables listed in the table are not jointly statistically significant ($p = 0.117$) in a logit regression model predicting treatment assignment, there is evidence of imbalance on the income and income missing variables. All models reported in Table 3 below include controls for all the variables listed in Appendix Table 7.

[17] The neighbors mailing also included a brief appeal to the respondent's sense of civic duty.

**Table 3** Moderating effects of Big Five traits (field experiment)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Field experiment: DV = validated turnout in 2006 primary election (1 = yes) | | | | | | | |
| | All HHs | One-voter HHs | Two-voter HHs | All HHs | All HHs: demographic interactions | One-voter HHs: demographic interactions | Two-voter HHs: demographic interactions | All HHs: demographic interactions |
| Treatment: social pressure (1 = yes) | 0.089 [0.023]*** | 0.110 [0.034]*** | 0.072 [0.031]** | 0.087 [0.023]*** | 0.018 [0.416] | 0.949 [0.656] | −0.871 [0.610] | 0.077 [0.417] |
| Extraversion (standardized) | −0.018 [0.016] | 0.002 [0.022] | −0.036 [0.023] | −0.001 [0.022] | −0.018 [0.016] | −0.002 [0.023] | −0.034 [0.024] | −0.003 [0.022] |
| Agreeableness (standardized) | −0.050 [0.018]*** | −0.019 [0.025] | −0.074 [0.025]*** | −0.031 [0.024] | −0.047 [0.018]*** | −0.025 [0.026] | −0.065 [0.026]** | −0.028 [0.025] |
| Conscientiousness (standardized) | 0.005 [0.016] | −0.010 [0.021] | 0.018 [0.023] | −0.007 [0.021] | 0.004 [0.015] | −0.009 [0.021] | 0.015 [0.023] | −0.008 [0.021] |
| Emotional Stability (standardized) | 0.004 [0.017] | −0.029 [0.022] | 0.039 [0.025] | −0.026 [0.022] | 0.006 [0.016] | −0.028 [0.022] | 0.045 [0.025]* | −0.025 [0.022] |
| Openness (standardized) | 0.013 [0.016] | 0.003 [0.022] | 0.026 [0.024] | 0.005 [0.021] | 0.012 [0.016] | 0.001 [0.022] | 0.024 [0.024] | 0.002 [0.022] |
| Social pressure × Extraversion | −0.013 [0.024] | −0.050 [0.036] | 0.015 [0.032] | −0.054 [0.036] | −0.012 [0.024] | −0.040 [0.037] | 0.011 [0.032] | −0.050 [0.036] |
| Social pressure × Agreeableness | 0.021 [0.024] | −0.027 [0.037] | 0.047 [0.032] | −0.020 [0.037] | 0.015 [0.026] | −0.004 [0.040] | 0.031 [0.035] | −0.023 [0.038] |
| Social pressure × Conscientiousness | 0.001 [0.024] | 0.012 [0.034] | −0.001 [0.034] | 0.009 [0.034] | 0.004 [0.024] | 0.008 [0.034] | 0.002 [0.034] | 0.010 [0.034] |
| Social pressure × Emotional Stability | −0.001 [0.024] | 0.066 [0.037]* | −0.051 [0.033] | 0.066 [0.037]* | −0.005 [0.025] | 0.061 [0.037]* | −0.061 [0.034]* | 0.065 [0.037]* |
| Social pressure × Openness | 0.031 [0.024] | 0.098 [0.035]*** | −0.013 [0.032] | 0.097 [0.035]*** | 0.030 [0.024] | 0.097 [0.036]*** | −0.010 [0.032] | 0.097 [0.035]*** |

**Table 3** continued

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Field experiment: DV = validated turnout in 2006 primary election (1 = yes) | | | | | | | |
| | All HHs | One-voter HHs | Two-voter HHs | All HHs | All HHs: demographic interactions | One-voter HHs: demographic interactions | Two-voter HHs: demographic interactions | All HHs: demographic interactions |
| HH size (0 = one-person; 1 = two-person) × Extraversion (standardized) | | | | −0.035 [0.032] | | | | −0.032 [0.032] |
| HH size (0 = one-person; 1 = two-person) × Agreeableness (standardized) | | | | −0.034 [0.033] | | | | −0.034 [0.034] |
| HH size (0 = one-person; 1 = two-person) × Conscientiousness (standardized) | | | | 0.025 [0.031] | | | | 0.025 [0.031] |
| HH size (0 = one-person; 1 = two-person) × Emotional Stability (standardized) | | | | 0.063 [0.033]* | | | | 0.065 [0.033]** |
| HH size (0 = one-person; 1 = two-person) × Openness (standardized) | | | | 0.019 [0.032] | | | | 0.021 [0.032] |
| Social pressure × HH size × Extraversion (standardized) | | | | 0.068 [0.048] | | | | 0.064 [0.048] |
| Social pressure × HH size × Agreeableness (standardized) | | | | 0.065 [0.049] | | | | 0.062 [0.049] |
| Social pressure × HH size × Conscientiousness (standardized) | | | | −0.012 [0.048] | | | | −0.010 [0.048] |

**Table 3** continued

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Field experiment: DV = validated turnout in 2006 primary election (1 = yes) | | | | | | | |
| | All HHs | One-voter HHs | Two-voter HHs | All HHs | All HHs: demographic interactions | One-voter HHs: demographic interactions | Two-voter HHs: demographic interactions | All HHs: demographic interactions |
| Social pressure × HH size × Emotional Stability (standardized) | | | | −0.119 [0.050]** | | | | −0.122 [0.050]** |
| Social pressure × HH size × Openness (standardized) | | | | −0.108 [0.047]** | | | | −0.109 [0.047]** |
| HH size (0 = one-person; 1 = two-person) | −0.018 [0.024] | | | −0.018 [0.024] | −0.021 [0.024] | | | −0.021 [0.024] |
| Age (in years) | 0.003 [0.007] | 0.006 [0.010] | 0.001 [0.010] | 0.003 [0.007] | 0.006 [0.009] | 0.018 [0.012] | −0.010 [0.016] | 0.007 [0.009] |
| $Age^2/100$ | −0.002 [0.006] | −0.004 [0.008] | 0.000 [0.009] | −0.002 [0.006] | −0.006 [0.008] | −0.015 [0.010] | 0.007 [0.014] | −0.007 [0.008] |
| Female = 1 | 0.047 [0.024]** | −0.010 [0.036] | 0.093 [0.033]*** | 0.048 [0.024]** | 0.029 [0.034] | 0.012 [0.047] | 0.052 [0.052] | 0.029 [0.034] |
| White = 1 | −0.018 [0.045] | −0.075 [0.061] | 0.028 [0.068] | −0.023 [0.046] | −0.073 [0.063] | −0.092 [0.079] | −0.080 [0.106] | −0.080 [0.063] |
| Education (1 = no HS; 5 = post-graduate) | 0.005 [0.012] | 0.001 [0.017] | 0.010 [0.016] | 0.004 [0.012] | −0.017 [0.016] | −0.008 [0.021] | −0.032 [0.025] | −0.017 [0.016] |
| Income (1 ≤ 10k; 9 ≥ 150k; 10 = RF/DK) | −0.004 [0.007] | 0.006 [0.010] | −0.016 [0.011] | −0.004 [0.008] | −0.003 [0.010] | 0.004 [0.013] | −0.018 [0.019] | −0.002 [0.010] |
| Income missing | −0.026 [0.042] | −0.076 [0.063] | 0.013 [0.059] | −0.030 [0.043] | −0.004 [0.059] | −0.047 [0.080] | 0.063 [0.093] | −0.008 [0.059] |
| Constant | 0.295 [0.202] | 0.226 [0.305] | 0.338 [0.289] | 0.301 [0.205] | 0.339 [0.293] | −0.080 [0.395] | 0.909 [0.483]* | 0.313 [0.296] |

**Table 3** continued

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Field experiment: DV = validated turnout in 2006 primary election (1 = yes) | | | | | | | |
| | All HHs | One-voter HHs | Two-voter HHs | All HHs | All HHs: demographic interactions | One-voter HHs: demographic interactions | Two-voter HHs: demographic interactions | All HHs: demographic interactions |
| Observations | 1902 | 885 | 1017 | 1902 | 1902 | 885 | 1017 | 1902 |
| $R^2$ | 0.019 | 0.039 | 0.027 | 0.028 | 0.024 | 0.048 | 0.036 | 0.033 |
| Demographics × treatment interactions included? | No | No | No | No | Yes | Yes | Yes | Yes |
| Social pressure interactions (Prob >$F$) | 0.703 | 0.023 | 0.528 | | 0.797 | 0.036 | 0.573 | |
| Three-way interactions (Prob >$F$) | | | | 0.019 | | | | 0.018 |

*Note* Results from OLS regression models. Robust standard errors in brackets

*Source* Phone Survey of Field Experiment Participants

* Significant at 10 %, ** significant at 5 %, *** significant at 1 % (two-tailed tests)

demographic controls. We present a variety of specifications and different sample restrictions in Table 3. The results for the overall sample appear in column (1).

Given the nature of the treatment message—specifically, that it presented information about the voting behavior of all registered voters in the HH and promised to divulge information about their future voting behavior—there is reason to expect that the factors that affect how an individual who lives with another registered voter responded to the message differed from how an individual who was the sole registered voter interacted with the message. We emphasize that our design does not provide a way to examine the mechanisms driving such differences directly; however, one possibility is that when a message like this is delivered to a multi-voter HH, those voters may discuss the message. This process of discussion may lead an individual discussant to interpret the message in a distinctive fashion or provide a sense of solidarity that alters the factors that shape how that individual responds to the message. For example, an individual living in a one-voter HH who is low on Emotional Stability may see compliance with the message as the only way to alleviate the anxiety the message induced whereas this anxiety may be assuaged through discussion among those living with another targeted individual. Thus, like other work that examines similar data (e.g., Nickerson and Rogers 2010), we present our analysis separately for different HH sizes (number of registered voters in the HH $= 1$ in column [2] and $= 2$ in column [3]). Finally, in column (4) we present a model that interacts HH size ($0 =$ one-person registered voter HHs; $1 =$ two-person registered voter HHs) with: (a) each of the Big Five traits, (b) the treatment, and (c) the treatment interacted with each of the Big Five traits (three-way interactions).[18]

Overall, we do not find any evidence of moderating effects for Big Five personality traits in either the entire sample or for two-voter HHs. However, there are strong effects in one-voter HHs that are similar to those observed in the survey experiment discussed above. Focusing on the one-person HHs, individuals high on Emotional Stability and Openness responded significantly more favorably to the appeal. This result is apparent in the column (2) specification that is restricted to one-person HHs as well as in the column (4) specification where we include all HHs and interact HH size with the treatment–personality interactions. In that model, the three-way interactions are jointly significant at $p < 0.05$ and the coefficients on the Emotional Stability and Openness three-way interactions are each also independently statistically significant. These moderating effects in one-person HHs are large in substantive terms. Per the column (2) specification, the intervention did not significantly increase turnout among those scoring low on Emotional Stability (one standard deviation below the mean; estimated effect $= 4.5$ percentage points, $p = 0.379$) but substantially increased the likelihood of turning out among those scoring high on this trait (one standard deviation above the mean; estimated effect $= 17.6$ percentage points, $p < 0.01$). Similarly, among those scoring one standard deviation below the mean on Openness, the treatment effect is a statistically insignificant 1.2 percentage points ($p = 0.809$), while among those scoring one standard deviation above the mean on Openness the effect is a very large 20.9 percentage points ($p < 0.01$).

[18] Logit models yield substantively similar results and are presented in Appendix Table 8. Sample means and balance tests by HH size are reported in Appendix Table 9.

In addition to these statistically significant results in one-person HHs, the negative coefficients on the interactions for Extraversion ($p = 0.17$) and Agreeableness ($p = 0.47$) also are consistent with the results in the survey experiment, although in the latter case the coefficient is both imprecisely estimated and modest in size. Among people low on Extraversion, the *social pressure treatment* increased the likelihood of turning out by 16.0 percentage points while for those high on this trait this effect was only 6.0 percentage points (although this difference in effect sizes is not statistically significant; $p = 0.17$). Finally, the coefficient on Conscientiousness is positive here (in contrast to the statistically significant negative coefficient in the survey experiment), but it is small in absolute terms and imprecisely estimated.

In columns (5) through (8) we include interactions between each of the demographic variables and the treatment indicator variable to rule out the possibility that there are heterogeneous treatment effects associated with demographic factors included in our model that we incorrectly attribute to personality because of a correlation between those demographic characteristics and personality traits. The results are highly similar to those in columns (1) through (4), suggesting that the estimated coefficients on the interactions between the Big Five traits and the treatment are not capturing any relationships between these traits and demographic characteristics that may also moderate the effects of the treatment.

Again, we are not able to determine exactly why we find different results in the one- and two-voter HHs. Above we noted that one explanation may be that the process of discussing the message in two-voter HHs alters the meaning and implications of the message and, thus, how Big Five factors shape individuals' responses to the message. However, there are a variety of other potential explanations for the stark difference we find between one- and two-voter HHs in the moderating effects of Big Five traits. Sampling variability is one possibility, as is the possibility of some omitted variable correlated with HH size and personality that also moderates treatment efficacy. Another possibility is that some voters in multi-voter HHs may have received information about the message second-hand (e.g., were told about it by another HH member), rather than being directly exposed to the message. We note that the manner in which the subjects are exposed to the message in a one-voter HH might more closely parallel the response framework that characterizes the survey experiment described above. In that framework, the recipient was directly exposed to a message and responded to it independently. For this reason, it is encouraging that the pattern of findings in the one-voter HHs is similar to that associated with the *social pressure treatment* used in the survey experiment.

## Discussion and Conclusion

Political scientists have turned increasing attention to the study of how non-political psychological dispositions may shape political attitudes and behavior. This work has found many important correlations between measures of dispositions, such as the Big Five personality traits, and political attitudes and behavior. We extend this research to explore how Big Five personality traits might lead to differences in political behavior by investigating whether they affect responses to GOTV appeals.

Previous research has demonstrated that appeals designed to increase voter turnout can be effective, but that not all citizens are mobilized. In this paper, we argue that individuals' Big Five personality traits may influence their responsiveness to voter mobilization appeals. To test this hypothesis, we designed and implemented a survey-based experiment and built on findings from a field experiment by conducting a survey of individuals included in that sample. These designs allowed us to evaluate the interaction of core personality traits and GOTV appeals in both a survey and field setting. Overall, accounting for the moderating effects of Big Five traits does not dramatically improve the explanatory power of our models. However, the results do support our expectation that the Big Five traits play some role in shaping responses to GOTV appeals and further instantiate the claim that the Big Five traits can affect how individuals respond to political stimuli.

Survey experiments are subject to the critique that relationships observed in a survey setting may not persist in less artificial settings. The findings from the field experiment we report here help to address this critique and provide further support for the notion that Big Five traits play a role in shaping behavioral responses (turnout) to persuasive (GOTV) appeals. The fact that the moderating effects that we identify in the field experiment for one-person HHs are similar to those we find in a survey experiment bolster the validity of this conclusion. At the same time, assuming that the differences we find across HH types are not just due to sampling error, the fact that we find differences between one- and two-person HHs in the field experiment suggests that the context in which messages are received may alter their effects. Future researchers could implement designs that permit more direct examination of how factors like ready opportunities to discuss a persuasive message affect how Big Five traits shape responses to these messages.

The studies presented here have a number of limitations. Above we noted that both the act of voting and Big Five personality traits are multi-faceted and that, therefore, our analysis is somewhat exploratory. The fact that we make multiple comparisons within our sample also raises the possibility of falsely detecting effects due to sampling variability. In light of these concerns, an important next step is to replicate these findings in other samples and at other points in time.

Another limitation of the present study pertains to the messages used. The messages we tested here were selected because they are commonly used by organizations in their attempts to increase turnout. However, scholars have posited that Big Five traits may lead to variation in the social meaning of stimuli across individuals and contexts and that this variation in the meaning of stimuli, in turn, affects the relationships between personality traits and behavioral and attitudinal outcomes (Mondak 2010; Gerber et al. 2010). A promising avenue for future research would be to build on our findings by directly assessing the mechanisms that account for the findings we report here: Can our findings be explained as a function of Big Five traits affecting the meaning of the messages tested or were the messages understood similarly but responded to differently depending on the receiver's personality traits?

Future work could also build on this study by using improved measures of the Big Five traits. Although measures from the 10-item personality battery we use are correlated with measures using more extensive batteries and its brevity provides a substantial practical benefit, they suffer from measurement error. Because this type

of error tends to attenuate observed relationships, our findings may understate the true magnitude of the moderating effects of Big Five traits. Beyond the benefit of reducing measurement error, more extensive batteries could ideally provide a way to measure the facets of the Big Five traits. This would provide a way to examine what aspects of each trait are responsible for the relationships we observe. For example, this would provide a way to assess whether our finding that Conscientiousness is associated with resistance to civic duty appeals is a function of the hypothesized resistance effects of the achievement-striving facet of this trait outweighing the hypothesized acceptance effects of the dutifulness facet.

The research presented here is a first step in what appears to be a promising line of research on the relationship between Big Five personality traits and responses to appeals to participate in politics. Although our findings have a number of important limitations, they constitute progress toward better understanding how Big Five traits affect how people evaluate the costs and benefits of voting and how messages that highlight the various costs and benefits of voting can affect the likelihood that individuals with different personality traits will participate in the political process.

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## Appendix

See Tables 4, 5, 6, 7, 8 and 9.

**Table 4** Summary statistics by condition (survey experiment)

| Variable | All | Control | Social pressure | Civic duty | Instrumental benefits |
|---|---|---|---|---|---|
| Age (in years) | 32.688 [11.427] | 31.698 [11.2278] | 32.946 [11.3078] | 34.276 [11.9812] | 31.551 [10.8992] |
| Black = 1 | 0.059 [0.2352] | 0.084 [0.2783] | 0.032 [0.1772] | 0.057 [0.2324] | 0.060 [0.2371] |
| Hispanic = 1 | 0.052 [0.223] | 0.050 [0.2175] | 0.065 [0.2463] | 0.048 [0.2148] | 0.049 [0.2157] |
| Other race = 1 | 0.095 [0.2932] | 0.094 [0.2926] | 0.091 [0.289] | 0.083 [0.277] | 0.114 [0.3181] |
| Female = 1 | 0.587 [0.4927] | 0.550 [0.4988] | 0.656 [0.4764] | 0.570 [0.4961] | 0.578 [0.4952] |
| Education (1 = no HS; 6 = post-graduate) | 4.095 [1.2907] | 4.055 [1.286] | 4.108 [1.2689] | 4.044 [1.3595] | 4.189 [1.2344] |
| Income (1 ≤ 10k; 14 ≥ 150k; 15 = RF/skipped) | 8.003 [3.6671] | 7.738 [3.5219] | 7.914 [3.7966] | 8.298 [3.6328] | 8.016 [3.7351] |
| Income missing | 0.084 [0.277] | 0.064 [0.246] | 0.091 [0.289] | 0.101 [0.3018] | 0.076 [0.2652] |
| Turnout Intent, 2010 (0-1) | 0.828 [.2433] | 0.810 [.2448] | 0.811 [.2551] | 0.869 [.2096] | 0.816 [.2636] |
| Observations | 801 | 202 | 186 | 228 | 185 |

*Note* Cell entries are means. Standard deviations in brackets. Tests of statistical significance of covariates in multinomial logit regression model predicting survey experiment treatment assignment: full model ($p = 0.307$); age ($p = 0.030$); tests of the statistical significance of all other covariates have $p$ values >0.10

**Table 5** Correlations between Big Five measures

| | Extraversion | Agreeableness | Conscientiousness | Emotional Stability | Openness |
|---|---|---|---|---|---|
| Survey experiment | | | | | |
| Extraversion | 1.000 | | | | |
| Agreeableness | 0.052 | 1.000 | | | |
| Conscientiousness | 0.092 | 0.193 | 1.000 | | |
| Emotional Stability | 0.178 | 0.307 | 0.345 | 1.000 | |
| Openness | 0.278 | 0.157 | −0.038 | 0.118 | 1.000 |
| Field experiment | | | | | |
| Extraversion | 1.000 | | | | |
| Agreeableness | 0.010 | 1.000 | | | |
| Conscientiousness | 0.117 | 0.192 | 1.000 | | |
| Emotional Stability | 0.099 | 0.291 | 0.268 | 1.000 | |
| Openness | 0.249 | 0.134 | 0.128 | 0.168 | 1.000 |

**Table 6** Big Five summary statistics from MTurk survey experiment and national sample

| Variable | Survey experiment (MTurk) | National sample (CCES) |
|---|---|---|
| Extraversion | 0.469 [0.2650] | 0.526 [0.2447] |
| Agreeableness | 0.662 [0.2002] | 0.696 [0.1971] |
| Conscientiousness | 0.701 [0.2106] | 0.770 [0.1995] |
| Emotional Stability | 0.611 [0.2401] | 0.660 [0.2285] |
| Openness | 0.720 [0.1991] | 0.688 [0.1944] |
| Observations | 801 | 12840 |

*Note* Cell entries are means with standard deviations in brackets. MTurk Study was fielded in February 2010; CCES was fielded in November 2009

**Table 7** Summary statistics by condition (field experiment)

| Variable | All | Control | Treatment |
|---|---|---|---|
| Age (in years) | 55.051 [12.7212] | 55.358 [12.7374] | 54.723 [12.7028] |
| Female = 1 | 0.570 [0.4952] | 0.564 [0.4961] | 0.576 [0.4945] |
| White = 1 | 0.931 [0.2533] | 0.928 [0.2594] | 0.935 [0.2468] |
| Education (1 = no HS; 5 = post-graduate) | 3.382 [1.0804] | 3.395 [1.062] | 3.368 [1.1] |
| Income ($1 \leq$ 10k; $9 \geq$ 150k; 10 = RF/DK) | 6.766 [2.5344] | 6.656 [2.5714] | 6.883 [2.4907] |
| Income missing | 0.245 [0.4299] | 0.242 [0.4284] | 0.247 [0.4317] |
| Turnout 2006—primary | 0.415 [0.4929] | 0.376 [0.4845] | 0.458 [0.4985] |
| Observations | 1902 | 980 | 922 |

*Note* Cell entries are means. Standard deviations in brackets. Tests of statistical significance of covariates in logit regression model predicting treatment assignment: full model ($p = 0.117$); income and income missing (joint test; $p = 0.024$); tests of the statistical significance of all other covariates have $p$ values >0.05

**Table 8** Moderating effects of Big Five traits (field experiment, logit)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Field experiment: DV = validated turnout in 2006 primary election (1 = yes) | | | | | | | |
| | All HHs | One-voter HHs | Two-voter HHs | All HHs | All HHs: demographic interactions | One-Voter HHs: demographic interactions | Two-voter HHs: demographic interactions | All HHs: demographic interactions |
| Treatment: social pressure (1 = yes) | 0.372 [0.096]*** | 0.451 [0.145]*** | 0.312 [0.133]** | 0.365 [0.098]*** | 0.102 [1.744] | 4.162 [2.844] | −3.716 [2.583] | 0.352 [1.763] |
| Extraversion (standardized) | −0.076 [0.069] | 0.006 [0.096] | −0.161 [0.101] | −0.003 [0.094] | −0.080 [0.070] | −0.010 [0.098] | −0.151 [0.104] | −0.012 [0.096] |
| Agreeableness (standardized) | −0.210 [0.073]*** | −0.080 [0.103] | −0.319 [0.109]*** | −0.132 [0.099] | −0.200 [0.077]*** | −0.108 [0.108] | −0.287 [0.115]** | −0.121 [0.104] |
| Conscientiousness (standardized) | 0.021 [0.066] | −0.043 [0.088] | 0.079 [0.105] | −0.030 [0.087] | 0.018 [0.066] | −0.037 [0.088] | 0.067 [0.103] | −0.033 [0.087] |
| Emotional Stability (standardized) | 0.016 [0.070] | −0.121 [0.093] | 0.175 [0.114] | −0.108 [0.092] | 0.025 [0.070] | −0.121 [0.094] | 0.202 [0.114]* | −0.105 [0.093] |
| Openness (standardized) | 0.057 [0.068] | 0.014 [0.092] | 0.119 [0.107] | 0.020 [0.091] | 0.052 [0.069] | 0.005 [0.093] | 0.108 [0.105] | 0.009 [0.092] |
| Social pressure × Extraversion | −0.048 [0.097] | −0.211 [0.153] | 0.073 [0.134] | −0.227 [0.153] | −0.044 [0.100] | −0.176 [0.159] | 0.053 [0.138] | −0.213 [0.156] |
| Social pressure × Agreeableness | 0.090 [0.099] | −0.113 [0.156] | 0.209 [0.137] | −0.086 [0.155] | 0.068 [0.107] | −0.019 [0.168] | 0.142 [0.148] | −0.101 [0.163] |
| Social pressure × Conscientiousness | 0.005 [0.099] | 0.049 [0.141] | −0.009 [0.145] | 0.037 [0.142] | 0.016 [0.100] | 0.031 [0.142] | 0.004 [0.146] | 0.044 [0.144] |
| Social pressure × Emotional Stability | −0.006 [0.102] | 0.277 [0.154]* | −0.226 [0.145] | 0.280 [0.155]* | −0.021 [0.103] | 0.263 [0.156]* | −0.269 [0.148]* | 0.277 [0.157]* |
| Social pressure × Openness | 0.127 [0.099] | 0.416 [0.153]*** | −0.062 [0.139] | 0.414 [0.154]*** | 0.124 [0.101] | 0.417 [0.159]*** | −0.049 [0.139] | 0.415 [0.158]*** |

**Table 8** continued

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Field experiment: DV = validated turnout in 2006 primary election (1 = yes) | | | | | | | |
| | All HHs | One-voter HHs | Two-voter HHs | All HHs | All HHs: demographic interactions | One-Voter HHs: demographic interactions | Two-voter HHs: demographic interactions | All HHs: demographic interactions |
| HH size (0 = one-person; 1 = two-person) × Extraversion (standardized) | | | | −0.155 [0.137] | | | | −0.143 [0.137] |
| HH size (0 = one-person; 1 = two-person) × Agreeableness (standardized) | | | | −0.151 [0.142] | | | | −0.152 [0.143] |
| HH size (0 = one-person; 1 = two-person) × Conscientiousness (standardized) | | | | 0.107 [0.135] | | | | 0.106 [0.134] |
| HH size (0 = one-person; 1 = two-person) × Emotional Stability (standardized) | | | | 0.275 [0.145]* | | | | 0.284 [0.145]* |
| HH size (0 = one-person; 1 = two-person) × Openness (standardized) | | | | 0.084 [0.139] | | | | 0.093 [0.138] |
| Social pressure × HH size × Extraversion (standardized) | | | | 0.300 [0.203] | | | | 0.283 [0.204] |
| Social pressure × HH size × Agreeableness (standardized) | | | | 0.288 [0.206] | | | | 0.275 [0.208] |
| Social pressure × HH size × Conscientiousness (standardized) | | | | −0.056 [0.202] | | | | −0.049 [0.203] |

**Table 8** continued

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Field experiment: DV = validated turnout in 2006 primary election (1 = yes) | | | | | | | |
| | All HHs | One-voter HHs | Two-voter HHs | All HHs | All HHs: demographic interactions | One-Voter HHs: demographic interactions | Two-voter HHs: demographic interactions | All HHs: demographic interactions |
| Social pressure × HH size × Emotional Stability (standardized) | | | | −0.510 [0.212]** | | | | −0.526 [0.214]** |
| Social pressure × HH size × Openness (standardized) | | | | −0.466 [0.207]** | | | | −0.471 [0.208]** |
| HH size (0 = one-person; 1 = two-person) | −0.076 [0.099] | | | −0.077 [0.100] | −0.089 [0.100] | | | −0.089 [0.102] |
| Age (in years) | 0.012 [0.028] | 0.026 [0.041] | 0.003 [0.041] | 0.012 [0.028] | 0.026 [0.040] | 0.081 [0.056] | −0.041 [0.067] | 0.030 [0.040] |
| $Age^2/100$ | −0.009 [0.024] | −0.017 [0.035] | −0.001 [0.037] | −0.009 [0.024] | −0.025 [0.034] | −0.067 [0.047] | 0.028 [0.060] | −0.029 [0.035] |
| Female = 1 | 0.199 [0.101]** | −0.042 [0.151] | 0.393 [0.140]*** | 0.203 [0.102]** | 0.124 [0.147] | 0.049 [0.198] | 0.233 [0.227] | 0.128 [0.148] |
| White = 1 | −0.075 [0.190] | −0.314 [0.254] | 0.128 [0.295] | −0.097 [0.191] | −0.305 [0.257] | −0.384 [0.320] | −0.351 [0.453] | −0.339 [0.260] |
| Education (1 = no HS; 5 = post-graduate) | 0.021 [0.048] | 0.002 [0.072] | 0.042 [0.067] | 0.016 [0.049] | −0.076 [0.069] | −0.035 [0.090] | −0.144 [0.112] | −0.072 [0.069] |
| Income (1 ≤ 10k; 9 ≥ 150k; 10 = RF/DK) | −0.017 [0.031] | 0.025 [0.044] | −0.067 [0.048] | −0.015 [0.032] | −0.012 [0.044] | 0.019 [0.055] | −0.079 [0.081] | −0.010 [0.045] |
| Income missing | −0.110 [0.178] | −0.325 [0.268] | 0.057 [0.248] | −0.127 [0.180] | −0.015 [0.252] | −0.202 [0.339] | 0.277 [0.407] | −0.031 [0.254] |
| Constant | −0.851 [0.850] | −1.173 [1.305] | −0.695 [1.209] | −0.842 [0.860] | −0.688 [1.255] | −2.548 [1.771] | 1.766 [2.056] | −0.810 [1.277] |

**Table 8** continued

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Field experiment: DV = validated turnout in 2006 primary election (1 = yes) | | | | | | | |
| | All HHs | One-voter HHs | Two-voter HHs | All HHs | All HHs: demographic interactions | One-Voter HHs: demographic interactions | Two-voter HHs: demographic interactions | All HHs: demographic interactions |
| Observations | 1902 | 885 | 1017 | 1902 | 1902 | 885 | 1017 | 1902 |
| Demographics × treatment interactions included? | No | No | No | No | Yes | Yes | Yes | Yes |
| Social pressure interactions (Prob >*F*) | 0.704 | 0.037 | 0.507 | | 0.802 | 0.045 | 0.558 | |
| Three-way interactions (Prob >*F*) | | | | 0.024 | | | | 0.021 |

*Note* Results from logit regression models. Robust standard errors in brackets

*Source* Phone Survey of Field Experiment Participants

* Significant at 10 %, ** significant at 5 %, *** significant at 1 % (two-tailed tests)

**Table 9** Balance by HH size (field experiment)

| Variables | One-voter HHs | | | Two-voter HHs | | |
|---|---|---|---|---|---|---|
| | All | Control | Treatment | All | Control | Treatment |
| Age (in years) | 57.205 [13.0267] | 57.373 [13.0118] | 56.925 [13.0663] | 53.176 [12.1486] | 52.749 [11.8902] | 53.485 [12.3331] |
| Female = 1 | 0.583 [0.4933] | 0.570 [0.4956] | 0.605 [0.4895] | 0.559 [0.4968] | 0.557 [0.4973] | 0.559 [0.4969] |
| White = 1 | 0.918 [0.2753] | 0.915 [0.2791] | 0.922 [0.2691] | 0.943 [0.232] | 0.944 [0.2306] | 0.942 [0.2332] |
| Education (1 = no HS; 5 = post-graduate) | 3.366 [1.0895] | 3.423 [1.0826] | 3.271 [1.096] | 3.395 [1.0727] | 3.358 [1.0348] | 3.422 [1.0994] |
| Income (1 ≤ 10k; 9 ≥ 150k; 10 = RF/DK) | 6.363 [2.7573] | 6.389 [2.768] | 6.319 [2.7428] | 7.117 [2.2669] | 7.002 [2.2481] | 7.200 [2.2787] |
| Income missing | 0.233 [0.4228] | 0.241 [0.4278] | 0.220 [0.4148] | 0.255 [0.4359] | 0.244 [0.4297] | 0.263 [0.4405] |
| Turnout 2006—primary | 0.420 [0.4939] | 0.378 [0.4853] | 0.491 [0.5007] | 0.411 [0.4923] | 0.372 [0.484] | 0.439 [0.4967] |
| Observations | 885 | 553 | 332 | 1017 | 427 | 590 |

*Note* Cell entries are means. Standard deviations in brackets. Tests of statistical significance of covariates in logit regression model predicting field experiment treatment assignment: one-voter HHs—full model ($p = 0.257$), education ($p = 0.018$); two-voter HHs—full model ($p = 0.580$). Tests of the statistical significance of all other covariates have $p$ values >0.05

**Neighbors mailing**

30423-3 ||| || || | |||

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Dear Registered Voter:

WHAT IF YOUR NEIGHBORS KNEW WHETHER YOU VOTED?

Why do so many people fail to vote? We've been talking about the problem for years, but it only seems to get worse. This year, we're taking a new approach. We're sending this mailing to you and your neighbors to publicize who does and does not vote.

The chart shows the names of some of your neighbors, showing which have voted in the past. After the August 8 election, we intend to mail an updated chart. You and your neighbors will all know who voted and who did not.

DO YOUR CIVIC DUTY — VOTE!

| MAPLE DR | Aug 04 | Nov 04 | Aug 06 |
|---|---|---|---|
| 9995 JOSEPH JAMES SMITH | Voted | Voted | _____ |
| 9995 JENNIFER KAY SMITH | | Voted | _____ |
| 9997 RICHARD B JACKSON | | Voted | _____ |
| 9999 KATHY MARIE JACKSON | | Voted | _____ |
| 9999 BRIAN JOSEPH JACKSON | | Voted | _____ |
| 9991 JENNIFER KAY THOMPSON | | Voted | _____ |
| 9991 BOB R THOMPSON | | Voted | _____ |
| 9993 BILL S SMITH | | | _____ |
| 9989 WILLIAM LUKE CASPER | | Voted | _____ |
| 9989 JENNIFER SUE CASPER | | Voted | _____ |
| 9987 MARIA S JOHNSON | Voted | Voted | _____ |
| 9987 TOM JACK JOHNSON | Voted | Voted | _____ |
| 9987 RICHARD TOM JOHNSON | | Voted | _____ |
| 9985 ROSEMARY S SUE | | Voted | _____ |
| 9985 KATHRYN L SUE | | Voted | _____ |
| 9985 HOWARD BEN SUE | | Voted | _____ |
| 9983 NATHAN CHAD BERG | | Voted | _____ |
| 9983 CARRIE ANN BERG | | Voted | _____ |
| 9981 EARL JOEL SMITH | | | _____ |
| 9979 DEBORAH KAY WAYNE | | Voted | _____ |
| 9979 JOEL R WAYNE | | Voted | _____ |

**Question Wording and Coding: Survey Experiment (Internet Based)**

*Ten-Item Personality Battery* (*TIPI*): Here are a number of personality traits that may or may not apply to you. Please indicate the extent to which you agree or disagree with each statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other. I see myself as…

Extraverted, enthusiastic (Extraversion)
Critical, quarrelsome (Agreeableness; reverse-coded)
Dependable, self-disciplined (Conscientiousness)
Anxious, easily upset (Emotional Stability; reverse-coded)
Open to new experiences, complex (Openness to Experience)
Reserved, quiet (Extraversion; reverse-coded)
Sympathetic, warm (Agreeableness)
Disorganized, careless (Conscientiousness; reverse-coded)
Calm, emotionally stable (Emotional Stability)
Conventional, uncreative (Openness to Experience; reverse-coded)

[Response options: Disagree strongly, Disagree moderately, Disagree a little, Neither agree nor disagree, Agree a little, Agree moderately, Agree strongly. Items reverse-coded as indicated. Mean index created for each Big Five trait. Mean scales standardized to have a mean equal to zero and standard deviation of one.]

*Turnout 2008*: In talking to people about elections, we often find that a lot of people were not able to vote because they weren't registered, they were sick, or they just didn't have time. In 2008 Barack Obama ran on the Democratic ticket against John McCain for the Republicans. Which of the following statements best describes you:
I did not vote (in the November, 2008 election)
I thought about voting this time—but didn't
I usually vote, but didn't this time
I am sure I voted
[Sample restricted to those who voted in the 2008 election.]

*Demographics*
*Race*: What racial or ethnic group or groups best describes you?
(1) White
(2) Black
(3) Hispanic
(4) Asian
(5) Native American
(6) Mixed
(7) Other

[Indicators for race = Black, race = Hispanic, and race = Asian, Native American, Mixed, or Other]

*Education*: What is the highest level of education you have achieved?
(1) no high school diploma
(2) high school graduate

(3) some college, no degree
(4) 2-year college degree
(5) 4-year college degree
(6) post-graduate degree

*Income*: What was your total FAMILY income in 2009?
(1) Less than $10,000
(2) $10,000–$14,999
(3) $15,000–$19,999
(4) $20,000–$24,999
(5) $25,000–$29,999
(6) $30,000–$39,999
(7) $40,000–$49,999
(8) $50,000–$59,999
(9) $60,000–$69,999
(10) $70,000–$79,999
(11) $80,000–$99,999
(12) $100,000–$119,999
(13) $120,000–$149,999
(14) $150,000 or more
(15) prefer not to say
["Prefer not to say" coded as missing.]

*Age*: What is the year of your birth?
[Age calculated as 2008-year of birth]

*Gender*: What is your gender?
(1) Female
(2) Male

## Question Wording and Coding: Field Experiment (Phone Survey)

*Ten-Item Personality Battery* (*TIPI*): First, I am going to read a series of ten statements that may or may not apply to you. For each, please use one of the following five responses to tell me how much you agree or disagree with the statement. The five responses are: disagree strongly, disagree somewhat, neither agree nor disagree, agree somewhat, or agree strongly.

I see myself as [Trait 1] AND [Trait 2]. Do you disagree strongly, disagree somewhat, neither agree nor disagree, agree somewhat, or agree strongly with that statement? [Repeat response categories as necessary.]

[*If don't know/can't say*] We'd really like your response. What is your best guess?

[*If say I see myself as A but not B or otherwise try to offer multiple responses*] We'd like to know how you see yourself for both [Trait 1] and [Trait 2] together. How would you respond if you were considering them together?

| | Trait 1 | Trait 2 |
|---|---|---|
| Extraversion | Extraverted | Enthusiastic |
| Agreeableness (reverse-coded) | Critical | Quarrelsome |
| Conscientiousness | Dependable | Self-disciplined |
| Emotional Stability (reverse-coded) | Anxious | Easily upset |
| Openness to Experience | Open to new experiences | Complex |
| Extraversion (reverse-coded) | Reserved | Quiet |
| Agreeableness | Sympathetic | Warm |
| Conscientiousness (reverse-coded) | Disorganized | Careless |
| Emotional Stability | Calm | Emotionally stable |
| Openness to Experience (reverse-coded) | Conventional | Uncreative |

[Items reverse-coded as indicated. Mean index created for each Big Five trait. Mean scales standardized to have a mean equal to zero and standard deviation of one.]

*Other Psychological Scales* (*Items from International Personality Item Pool*)

Next, using the same response categories, please tell me the extent to which you agree or disagree with the following six statements.

[Statement]. Do you disagree strongly, disagree somewhat, neither agree nor disagree, agree somewhat, or agree strongly with that statement? [Repeat response categories as necessary.]

| *Statements* |
|---|
| *Private Self-Consciousness*: |
| I examine my motives constantly |
| I don't try to figure myself out (R) |
| *Public Self-Consciousness*: |
| I worry about what people think of me |
| I feel comfortable with myself (R) |
| *Impression Management*: |
| I easily resist temptations |
| I am likely to show off if I get the chance (R) |

[Items reverse-coded as indicated. Mean indexes created for each scale. Mean scales standardized to have a mean equal to zero and standard deviation of one.]

*Demographics*

*Race*: What racial or ethnic group or groups best describes you? [READ; Multiple Responses OK]

(1) White
(2) Black
(3) Asian
(4) Native American
(5) Hispanic
(6) Other
(7) Don't know [Don't read]
(8) Don't want to tell you [Don't read]

[Indicator for race = White]

*Education*: What is the highest level of education or grade of school you have completed? [DON'T READ]

(1) No high school diploma or equivalent
(2) High school graduate, GED, or other equivalent
(3) Some college, 2-year degree, no degree
(4) 4-Year college degree
(5) Post-graduate degree
(6) Don't know [Don't read]
(7) Don't want to tell you [Don't read]

["Don't know" and "Don't want to tell you" coded as missing.]

*Income*: Last year, that is in 2008, what was your total family income from all sources, before taxes? Just stop me when I get to the right category. [READ]

(1) Less than $10,000
(2) 10 to under $20,000
(3) 20 to under $30,000
(4) 30 to under $40,000
(5) 40 to under $50,000
(6) 50 to under $75,000
(7) 75 to under $100,000
(8) 100 to under $150,000
(9) $150,000 or more
(10) Don't know [Don't read]
(11) Don't want to tell you [Don't read]

["Don't know" and "Don't want to tell you" coded as missing.]

*Age*: What is your year of birth?
[Age calculated as 2008-year of birth]

*Gender*: Coded by interviewer

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