Leadership without Leaders?

Starters and Followers in On-line Collective Action

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A significant proportion of collective action now takes place online. But most online mobilizations fail and little is known about the distinctive characteristics of the ones that succeed. In offline environments, the existence of charismatic ‘leaders’ with ‘strong ties’ between them has been identified as crucial. In contrast, this paper tests the hypothesis that what matters online is the presence of ‘starters’ - evidence of which convince other potential participants that a mobilization is viable - and aims to identify the personality traits associated with willingness to ‘start’. It uses data from a laboratory experiment that investigated the behaviour of 186 individual subjects participating in small groups, deciding whether to contribute tokens to local ‘public good’ scenarios. We look for evidence of heterogeneous and consistent thresholds for joining mobilizations and investigate the personality characteristics of those subjects who have low thresholds. We found evidence of varying thresholds across our subjects, which were consistent at the lower and higher ends. We found two personality characteristics - ‘extraversion’ and ‘internal locus of control’ – to be significantly associated with low thresholds, while ‘agreeableness’ was associated with high thresholds. Analysis of data at round level showed that the higher the minimum level of extraversion among participants, the more likely the round was to get funded. The findings address previous work on thresholds in collective behaviour, testing for a political context the assumption that people have different and consistent thresholds for joining a mobilization, identifying the personality traits associated with low thresholds and thereby starting to identify the conditions for successful collective outcomes.

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Background: online collective action and leadership

Widespread use of the Internet means that many political mobilizations take place online and almost all mobilizations in countries with high levels of Internet penetration have an online element. The Internet clearly reduces the costs of collective action and political participation and has led some scholars to conclude that the availability of Internet-based platforms reframes long-standing conventional wisdom about the limits to mass political participation and propose a new ‘logic’ of collective action (Lupia and Sin, 2003). Certainly, the Internet has facilitated huge online ‘gatherings’ of people who do not know each other, and have carried out small participatory actions, such as signing a petition, sending a campaigning email, or raising the profile of a demonstration through endorsement or notification. These large-scale mobilizations of ‘micro-donations’ of resources have brought various political issues to public attention and have had some notable successes in bringing about policy change. For example, from 2009 to 2011, No 10 Downing Street operated an e-petitions site, which collected more than 8 million signatures from over 5 million unique email addresses. One petition on the site attained 1.8 million signatories and played a part in reversing the government’s policy plans to introduce road pricing (see Hale and Margetts, 2012).

However, most online mobilizations fail, while only a very few succeed. Low start-up costs mean that mobilizations that in offline environments would have failed to get off the ground, may achieve some sort of presence, but quickly wither away. For example, data collected from the No.10 Downing St e-petition site during the year before it closed in May 2010 relating to over 8,000 petitions (shown in Figure 1) show that 94 per cent of petitions failed to attain even the 500 signatures required to elicit an official response, a very modest criteria for success. Only a handful of these petitions obtained over a million signatures (identified as a tipping point in earlier research, see Margetts et al, 2011) and with regard to achieving the ultimate goal of policy change, very few of these petitions could be said to have been successful.

1 http://www.mysociety.org/projects/no10-petitions-website/
So what distinguishes those few online mobilizations that do obtain some kind of success? In the offline world, the success of political mobilization is often ascribed to the existence of effective leaders. Political science scholarship and research has ascribed great importance to leaders in collective action, people who overcome the co-ordination problems of an interest group or community by organizing and initiating action. They identify public goods and common goals to pursue; mobilize collective resources such as time, money and organization; and create and reinforce collective trust, group identity and cohesion (Colomer, 2011: 55). However, in online settings, many of these activities are less necessary. Internet-based platforms drastically reduce co-ordination and dissemination costs. They also reduce the cost of individual participatory acts, reducing the need for collective trust and group cohesion. It may be that online, what really matters is the existence of a number of people who are willing to ‘start’, rather than to undertake any of the raft of activities normally associated with leading. The petition data presented above provides some evidence for this claim by highlighting the importance of the first day. Those petitions that succeeded in obtaining 500 signatures obtain a median of 406 signatures on the first day, and nearly half of petitions (43 per cent) that succeeded did so in the first day. Overall, the number of signatures a petition gets in the first day is the most important factor in predicting whether the petition will eventually succeed. This finding suggests that the existence of a number of people willing to ‘start’ a mobilization, when there has been no media coverage and no reassuring evidence of other substantive support, are essential to its viability.

If starters are the ‘new leaders’, vital to the success of online mobilization, then they may be the key to identifying the characteristics of those mobilizations that succeed. If we can identify the types of people who are willing to undertake a participatory act with collective goals at an early point, when there is little indication of support, then we might be able to determine the necessary conditions for success; that is, the existence of sufficient numbers of this type of person. How might we be able to identify the characteristics of starters? For offline collective action, extensive research from a range of disciplines has identified personality as a key determinant of leadership style, with many studies aimed at identifying the
personality characteristics of effective leaders, for example in terms of charismatic leadership and the leadership styles most likely to engender co-operation (see Judge et al, 2002 for a review).

In this paper we aim to carry out the equivalent task for online collective action, investigating the personality characteristics of those people willing to go early in a mobilization, working on the assumption that willingness to start may require some of the personality characteristics normally associated with leadership, but not all of them. Transactional data about mobilizations of the kind shown in Figure 1 can be a valuable resource for political science researchers (Hale and Margetts, 2012), but it tells us nothing about the people to whom the transactions relate. So we turn to experimental data to investigate the characteristics of those people who are likely to sign up on the critical first day, providing a crucial signal of viability for those who follow. We focus on personality as the characteristic most likely to influence individual behaviour in this regard, following other political scientists who have argued recently that personality is ‘comparable to demographics and fundamental political predispositions’ in predicting political behaviours such as turnout and ideology (Gerber et al, 2011; Mondak, 2008). After all, the demographic characteristics of potential participants in online mobilizations are reasonably well established (see Dutton and Blank, 2011, for recent survey data), so would be unlikely to be useful to distinguish between different types of behaviour among those who have already decided, at some point, to participate. The first section below identifies some previous research into individual ‘thresholds’ for joining mobilizations, while the second section draws together research on leadership that might provide a clue to the personality of those individuals willing to ‘start’ online mobilizations, allowing us to build three hypotheses. The third section presents the experimental design and results, while the fourth section applies these results to each of the hypotheses developed in the earlier sections and discusses the research and policy implications of the findings.

Starters, followers and threshold effects

So, what characterises early movers? Alternatively, what types of people are willing to join a mobilization, but do so only when a ‘critical mass’ of other participants have already taken part, indicating that the
mobilization is likely to succeed? Are there distinctive characteristics that make certain people more likely to go first – or to wait until last - in mobilizations of this kind? We suggest that starters are the equivalent of ‘leaders’ in offline environments, but they don’t necessarily need to be the same sort of person, willing to undertake co-ordination or organization costs, or be well resourced in terms of time or money, or be ‘charismatic’. They just have to be willing to undertake the low-cost action of ‘starting’ in an information environment where they have few signals of viability or indications of whether other people will participate.

The clue to what type of people are willing to start a mobilization might come from much earlier work on ‘thresholds’ in collective behaviour. For example, Schelling (2005) in his 1978 work *Micromotives and Macrobehaviour* developed a number of models of mobilization, although not in a political context, based on the assumption that people have different ‘thresholds’ for joining a mobilization—that is, some will join when the number expected to join is low, most will join where the number expected to join is in the middle, and only a few will ‘hold out’ and join only after the number expected to join is high. He argued that where such thresholds are normally distributed, there will be an S-shaped joining curve for any mobilization, illustrated in its simplest form in Figure 2 with the number of people that will join plotted against the number that are expected to join. He produces a variety of models from this basic form, showing how sometimes the mobilization curve will cross the diagonal line, in a tipping point where the number of people participating meets the threshold of most people, and the mobilization to succeed. In other situations, where the curve does not meet the line, the mobilization will fail. Similarly, Granovetter (1978; 1983) identified the concept of threshold as key to the viability of collective behaviour, arguing that the distribution of thresholds was a vital determinant of outcomes. He put forward a formal model which he argued could predict, from the initial distribution of thresholds, the ultimate number or proportion of potential participants deciding to participate in collective behaviour. He argued that this model might be applied to a wide range of behaviours, such as voting, residential segregation, diffusion of innovations, strikes, migration and markets, as well as the more typical process of crowd behaviour and social movements (Granovetter, 1978: 1421).
Of course, in an online mobilization such as the petition curves shown in Figure 1, there will be at least one ‘leader’ who has set up the petition, and probably more than one who will circulate the petition to their immediate strong ties. But to obtain the numbers required to achieve a clear measure of success – and to achieve the ‘first day’ numbers that mean the majority will join - then there must be a substantive number who join at some number below the ‘normal’ threshold, that is with lower thresholds. And the ‘normal threshold’ will be way beyond the number that could be obtained with strong ties alone, but will be attained with weak ties, such as the friend of a friend of a friend on a social networking site, or the retweet of the retweet of a tweet. Even to obtain the 500 signatures used as a measure of ‘success’ for the petitions in the analysis above, the initiator of a petition would have to go beyond their immediate social network. At the end of 2011, the median number of friends on Facebook was 100, with a mean of 150 (Backstrom, 2011), while the median number of followers on Twitter was 85 with a mean of 557 (Bakshy et al, 2011). At this point, the information of how many signatures have been obtained will be a relatively important piece of social information. Schelling’s model shows how collective behaviour is unsustainable if substantive numbers of ‘starters’, with thresholds well below the half way mark did not exist and they will be crucial to the success of a mobilization. The aim of this research is to look for the existence of these ‘starters’, with lower than normal thresholds, and to assess their characteristics. This aim differentiates our work from that of (for example) Schelling or Granovetter, who ‘do not consider how individuals happen to have the preferences that they do’ (Granovetter, 1978: 1421). The threshold model suggests that there is continuity of behavioural dispositions before, during and after collective decisions are made; contingent dispositions that act on the situation, even if actual behaviour may change, but there is no attempt to identify the origins of these dispositions.

In online mobilizations, the ‘number expected’ is replaced with the ‘social information’ that most electronic interfaces provide, that is an indication of the number of other participants there have been on an e-petition, a mass email campaign, a Facebook group or a collection for charity. Although not all sites provide this information, most do and social media such as social networking sites or micro-blogging sites have such information in-built. So although Schelling makes the rather questionable assumption that the
‘Number expected’ figure is readily available – it may be that for the first time, his assumptions are easily met. Here, we use our data to test his claims, leading to our first hypothesis

**H1: People have heterogeneous propensity to ‘start’ in a collective action, with a few having a consistently low threshold for joining and some having consistently high thresholds, but most having thresholds somewhere midway**

**Personality and thresholds**

So what type of people might have high – or low – thresholds? With the aim of answering this question we analysed our data with respect to personality. There has been a revival of work in political science on the impact of personality upon political behaviour and beliefs (see Mondak and Halperin 2008; Mondak 2010; Mondak et al. 2010, 2011; Gerber et al. 2010, 2011), following an earlier development in economics and a much longer tradition and central role in psychology. Researchers from different disciplines use different personality categorizations to examine heterogeneous personality effects. In the experiment reported here, we borrowed three typologies: one from economics (social value orientation); one from political science (the ‘Big 5’ personality traits) and one from psychology (locus of control), allowing us to build a hypothesis as to what personality types would be most likely to be associated with ‘starting’ a mobilization. We looked to work on leadership and personality, seeing what previous research has shown about the personality characteristics of leaders. In general, no clear picture emerges, with studies of how personality traits relate to leadership giving inconsistent answers; ‘traditional and contemporary research shows that personality cannot explain leadership’ (Andersen, 2006); ‘results of investigations relating personality traits to leadership have been inconsistent and often disappointing’ (Judge et al, 2002: 765). However, for our purposes and our focus on ‘starting’ as the key important element of online mobilization, we were able to draw out some relevant research.

**Locus of Control:** First, in the field of organizational and applied psychology, internal locus of control - the extent to which people believe that they have control over their own fate - has been identified as an
important personality trait with respect to all kinds of social roles, including leadership. Developed by Rotter (1966) into a measurable scale (later shortened by Carpenter and employed in Carpenter and Seki, 2006), locus of control differentiates ‘internals’, those who believe that they are masters of their fate and perceive a strong link between their actions and consequences and ‘externals’, who do not believe themselves as having direct control of their fate and perceive themselves in a passive role with regard to the external environment. In work settings, internal locus of control has been positively associated with favourable work outcomes and greater job motivation (Ng et al 2006), job satisfaction and job performance (Judge et al 2002) and leadership (Spector 1982). In the field of business studies and management, people with internal locus of control have been identified as more likely to be leaders and associated with superior leadership performance (Anderson and Schneier 1978), as well as strategic leadership, innovation and entrepreneurship, although many previous studies have found no link between locus of control and productivity (e.g. Johnson et al. 1984, Hollenbeck and Whitener 1988, Blau 1993). Judge et al (2002) found locus of control to be a weaker predictor than other personality traits reviewed. In economics, Boone et al (1999) find that ‘internals’ in social dilemma situations are more likely than ‘externals’ to play so as to try to influence the behaviour of other players to achieve their goals, while externals behaved less strategically and showed less variation in their behaviour. With relevance for this study, locus of control is associated with certain types of behavioural orientation and has been viewed as a predictor of the tendency for people to exert active control over the environment (Ng et al 2006) and with propensity to participate in social action (Gore and Rotter 1963), although early research in this area delivered conflicting and confusing findings (Levenson and Miller 1976, Klandermans 1983). Some of this early research provided empirical support for the ‘competence theory’, showing that people with internal locus of control are more active in politics (Carlson and Hyde 1980, Guyton 1988, Milbrath and Goel 1977), but this interesting finding has been little explored by political scientists.

H2a: ‘Starters’ will be people with a high internal locus of control, that is a high Rotter score, while ‘followers’ will be people with a high external locus of control

8
Social value orientation: In economics, the typology of individual difference most akin to personality that is most frequently used is that of social-value orientation, a measure of personal values. Social value orientation has been used particularly extensively in laboratory experiments involving public goods and cooperation games (Fischbacher et al 2001, Keser and van Winden 2000) and, more recently, field experiments in which subjects are provided with varying levels of information about the participation of others (Frey and Meier 2004, Andreoni and Scholz 1998, Shang and Croson 2009). Much of this work has shown that people ‘differ strongly in their contribution preferences’ (Fischbacher and Gächter 2010) and authors have identified categorizations which develop the simple distinction between individualistic and cooperative (see Suleiman and Rapoport 1992, Weimann 1994, Fischbacher et al 1999, Fischbacher et al 2001, Fischbacher and Gächter 2010) to identify some participants as ‘strong free riders’, some as ‘reciprocators’ and some as ‘conditional co-operators’ (Kurzban and Houser 2001, 2005). First, various economists have found substantial heterogeneity in decisions across leaders and followers. That is, some followers maximize their own earnings while others contribute substantial amounts, while some leaders contribute nothing while others contribute large amounts. Gachter et al (2010) used an experiment on a simple leader-follower game to investigate the relationship between ‘co-operativeness’ (i.e. social value orientation) and the efficiency of a mobilization, finding that co-operators make better leaders; groups perform better when led by individuals who are willing to sacrifice personal benefit for the greater good. In general, these investigations have focused on social value orientation as a way of distinguishing the characteristics of willingness to act as leaders (or followers); what effect people’s social value orientations have on their preferences for a leader (de Cremer (2000), and which social value orientation makes for the best leaders and most effective mobilizations (Gachter et al, 2010). This research would suggest the following hypothesis:

H2b: ‘Starters’ will be people with a co-operative social value orientation, while ‘followers’ will be people with an individualistic social value orientation
‘Big 5’ personality traits: Finally, in the recent revival of interest in personality as a predictor of political behaviour, political scientists have made use of the ‘Big 5’ personality traits, which have been foundational in psychological studies (Wiggins 1996, John and Srivastava, 1999: 121), and for which a measurement instrument has been developed for situations where very short measures are needed and personality is not the primary topic of interest (Gosling et al 2003). Psychologists have reached a working consensus that these personality traits can be comprehensively conceptualized and reliably measured (Gerber et al 2010: 111) and are stable over time (Tickle et al, 2001). When used in political science, they are significant predictors of political outcomes such as turnout (Gerber et al 2010, Mondak and Halperin 2008). The ‘Big 5’ personality factors comprise openness, conscientiousness, extraversion, agreeableness, and neuroticism. Extraversion is about being outgoing and energetic rather than shy or reserved, and extraverted people have positive emotions and wish to seek stimulation in the company of others; agreeableness describes people who are friendly and compassionate rather than cold or unkind; conscientiousness is about being self-disciplined and efficient rather than easy-going or careless; emotional stability describes even-temperedness and contrasts with a neurotic temperament and anxiety; and openness refers to people who are inventive and curious rather than cautious. Gerber et al’s research shows these traits to have significant impacts on ideology that vary given the context of individuals. They join Mondak and Halperin in claiming that personality emerges as an important predictor of political behaviour and in finding ‘personality to be comparable to demographics and fundamental political predispositions’ (Mondak and Halperin 2008: 360). For example, Denny and Doyle (2008) found that personality was at least as associated with voter turnout as ‘interest in politics’, finding that those with hardworking, even-tempered and aggressive personalities are more likely to vote than those with lazy, moody and timid personalities (2008: 309).

From psychology, there has been work investigating the relationship between leadership and the ‘Big 5’ personality traits, a stream of research that has been revived in recent years. This work looks at two broad categories of leadership: leadership emergence and leadership effectiveness (Lord et al, 1986), the latter being less relevant to the current study. Although much of this work focuses on leaders in the sense
of other people’s views of the potential leader, rather than the ‘starter’ criteria that we are interested in here, and some researchers have dismissed ‘trait theory’ as obsolete in this context (Conger and Kanungo, 1998), two extensive and detailed reviews of leadership research (Lord et al, 1986; Judge et al, 2002) find evidence to suggest that the ‘Big 5’ typology ‘is a fruitful basis for examining the dispositional predictors of leadership’ (Judge et al, 2002: 773). Of the ‘Big 5’ characteristics, extraversion in particular has been positively associated to self and peer ratings of leadership (Gough, 1990; Judge et al, 2002). In their meta analysis of leadership and personality research, Judge et al (2002: 773) found that ‘Extraversion emerged as the most consistent correlate of leadership’, particularly with respect to leader emergence, although there were some findings for conscientiousness and openness to experience. For these reasons, we feed all the ‘Big 5’ personality traits into our analysis, while hypothesizing that extraversion will be the most important and the most likely to lead to a positive association (the ‘one to beat’).

**H2c**: ‘Starters’ will be people scoring highly on the personality trait of ‘extraversion’, while ‘followers’ will score lowly on extraversion.

In the ‘public goods’ experiment reported here, we used all three of these personality categorizations to assess the personalities of our subjects, and the relationship between these personality variables and the propensity of subjects to contribute to collective goods is reported in Margetts et al (2012). To tackle the above hypotheses, we analyse the data at the level of individuals, looking for evidence of consistent thresholds at the individual level and investigating the relationship between personality and threshold. We then analyse the data at the level of ‘rounds’ in the game, using the results from testing H1 and H2. If Schelling is right, then the existence of a sufficient number of ‘starters’, people who are willing to contribute at a low rank, will be crucial to the survival of a mobilization. If thresholds are normally distributed in a population, then there are a small number of people with low thresholds to make the crucial first steps, which then encourage other people with higher thresholds to join. If our previous analysis has produced personality traits which can be associated with threshold, then having at least one or two individuals in a round with these personality traits will be crucial to its success, leading to our third hypothesis:
**H3: Mobilizations will be significantly more likely to succeed when there are a number of ‘starters’ who have lower than normal joining thresholds**

**Research Design**

To test these hypotheses we use data from a laboratory experiment, some results of which have been reported in Margetts et al (2012). Subjects were provided with a number of local ‘public goods’ scenarios and we varied the social influence on them to participate, by providing (or not) social information about the participation of others, and by making them visible or anonymous. Results showed heterogeneity across personality type in terms of propensity to contribute to the collective good and in terms of susceptibility to social influence. Of the three personality categorizations discussed above, the most useful characterization in our previous analysis was provided by social value orientation; we found that individualistic types were less likely to contribute to the collective good (as would be expected) but significantly more susceptible to social influence, with both visibility and social information significantly affecting the amount they contributed in comparison with control conditions. In contrast, co-operative individuals were more likely to contribute but were negatively affected by both visibility and social information. We collected personality information on the other personality characteristics outlined above (locus of control and the ‘Big 5’ personality traits), but we found less consistent results for the ‘Big 5’ traits and locus of control did not affect contribution amount, neither people’s susceptibility to social information (see Margetts et al, 2012).

Here we test our hypotheses by examining all the personality variables in our data and examining the relationship between personality and the order in which they participated in the round by contributing tokens. We focus on those rounds run under the ‘social information’ condition, that is where participants were aware of how many others had contributed and whether they were leading or following at the precise moment where they decided to participate. We look at the order (or rank) in which individuals contribute, looking for consistent patterns in the ‘rank’ at which they join and do not join mobilizations to identify thresholds and then examining the relationship between personality and threshold. We also examined the
relationship between the propensity of a round or ‘game’ to get funded, and the personality of the people in the group.

Results

First, we looked for evidence of consistent ‘thresholds’ for entering a mobilization (to test Hypothesis 1), second we looked for the relationship between personality and threshold (Hypotheses 2a-2c), and third, looked at the relationship between the likelihood of a round getting funded, and the constituent personality types in the group of subjects participating in the round (Hypothesis 3)

Identifying thresholds

First, we tested H1 by examining the data for evidence of heterogeneous ‘thresholds’ for entering a mobilization, looking at the propensity of individual subjects to enter a mobilization in the early stages, when there was little or no evidence that others were participating. As candidates for threshold, we examined the ‘minimum’, ‘median’ and ‘mean’ rank at which subjects participated in a round as their ‘threshold’ for participation and the distribution of all three is shown in Figure 3. First, with respect to minimum rank, if an individual subject has a minimum rank of ‘1’, it indicates that they were willing to start a mobilization with no other participants, whereas if their minimum rank across the 28 rounds is ‘5’ then a higher threshold is suggested. Figure 3a shows the distribution of minimum rank across subjects, showing that just over half of the subjects were willing to ‘start’ at some point. This result was quite surprising, suggesting a far from normal distribution of people’s willingness to start a mobilization. To identify threshold, however, we need to identify consistent starters, rather than just people who are willing to start at some point. Therefore, second, we look at median rank, and the results are shown in Figure 3b. Here the figures are more evenly distributed, with a few subjects often starting (and therefore having a median rank of 1 or 2) and a few almost always joining only at the end of the mobilization, while most are somewhere between. The most common median rank is ‘3’, suggesting people who are most likely to contribute when over 25 per cent (2 out of 8, the most common group size) have already done so. Third, Figure 3c shows the results for mean rank, showing again a distribution which looks more ‘normal’.
Finally, we construct a variable to count the number of times a subject starts a round (propensity to start) normalized by the number of rounds the subject played. This variable exhibits an extremely skewed distribution (Figure 3d) with just under half of the participants never starting a round and for whom therefore the ‘propensity to start’ variable is zero. Of those subjects who do start a round at some point (i.e. have a value of one or greater and by consequence a minimum rank of one), the distribution is still right skewed, with most individuals only starting one or two rounds.

Each subject played between seven and fourteen rounds under social information, each with a randomly selected group of participants. We calculate the standard deviation of each subject’s ranks across these rounds as a measure of their consistency. Plotting this standard deviation score against the average rank of each participant (Figure 4) shows that nearly all subjects with a low or high average rank went early or late consistently. In contrast, while some subjects with an average rank towards the middle also had a low standard deviation score, other subjects were much less consistent and have higher standard deviation scores. These distributions confirm H1 showing that the subjects have heterogeneous propensities to start or join a collective action. It also shows that a few people have consistently low thresholds for joining, and some have consistently high thresholds. There is greater variability in subjects going near the middle, but ‘early movers’ and ‘late movers’ seem to act relatively consistently.

**Linking thresholds to personality**

The analysis above has identified four possible ways to identify the threshold for individual subjects: Minimum rank; Median rank; Mean rank; and Propensity to Start (a count of number of times going first). All four of these measures exhibit variance across subjects, supporting hypothesis H1. Before we could examine the relationship between these threshold measures and personality, we first examined the personality variables in our dataset for colinearity, the results of which are shown in Figure 5. These results show that in general the variables are not significantly correlated, but there were correlations of 0.34 and 0.35 between rotter score (the variable used to measure internal locus of control) and three of the ‘Big 5’ variables (Extravert, Open, and Emotionally Stable). For this reason, we ran separate regressions
for the ‘Big 5’ and rotter score when testing our hypotheses and they are shown in separate tables below.

We ran tobit regressions to test the association between the threshold measures and the various personality traits discussed above, in order to test hypotheses H2a-c, and these results are shown in Figure 6.

First, we found locus of control, the personality variable most often associated with leadership in psychology and management literature, to be significantly associated with going early in mobilizations. The locus of control variable was a predictor of median rank, mean rank, minimum rank, and propensity to start (Figure 6a) in a given group of subjects. So hypothesis 2a is confirmed.

Second, we found no significant association between threshold and social value orientation, the most consistent predictor of contribution amount and susceptibility to social information in our previous analysis (Margetts et al, 2012). Neither ‘pro-self’ nor ‘pro-social’ individuals were more or less likely to ‘start’ or ‘follow’ other subjects. So hypothesis 2b is rejected and we excluded social value orientation from subsequent analyses.

Third, we found significant results for two of the ‘Big 5’ personality traits, identified in recent political science research as important predictors of political behaviour. Across our measures of threshold, we found that extraversion is consistently associated with going early and agreeableness is consistently associated with going late. Figure 6b shows agreeable people as being strongly associated with higher median ranks and higher mean ranks, and lower propensity to start. The other personality variable that emerges as important is extraversion. Extravert people have a higher median rank (significant to 0.05), and a higher mean rank (significant to 0.02), and they are significantly more likely to have a high number of starts (significant to 0.001). None of the other ‘Big 5’ personality traits have a significant effect on these ‘threshold’ variables. These results confirm Hypothesis 2a with respect to extraversion, with the additional finding for agreeableness, which has a consistently higher coefficient than those for extraversion even though all variables are measured on the same scales.
**Conditions for successful mobilization**

Having found evidence of heterogeneous thresholds and propensity to ‘start’ a round, which to some extent may be attributed to personality (the personality traits of locus of control, extraversion and agreeableness), we turn to the round level data. If successful mobilizations rely on a number of people with low thresholds, and if these people are those with extravert personalities (or high internal locus of control), then it should be that rounds without some ‘extravert’ personalities will consistently fail. To test this assertion, we collapsed data at round level, looking at the maximum, minimum and mean score for internal locus of control, extraversion and locus of control in each round and the relationship between these variables and ‘funded’, the variable that indicates whether a round was funded or not.

We ran regressions for all personality variables separately while controlling for the mean importance of all participants on the team to the scenario at hand and the amount of the first contribution. Both of these variables have previously been shown to be important in how likely a round is to be funded. The mean importance of the issue to the subjects involved in the round is highly significant, as would be expected from the significance of this variable at the individual-level stacked data in the earlier section, and also in our previous analysis of the data (see Margetts et al, 2012). Basically, the higher importance ascribed to the issue, the more likely it is to be supported. The amount of the first contribution in a round is also significant, reaffirming results of previous experimental research in economics investigating conditional co-operation in charitable giving (see Shang and Croson, 2009). We control for these two variables in the regressions that follow.

Among all the personality variables tested, only extraversion was significant in explaining the likelihood of a round being funded. In particular, two measures of the extraversion on the team, mean and minimum, were significant, as shown in Table 7. That the minimum level of extraversion would be associated with whether a round gets funded is commensurate with our hypothesis. If we picture Schelling’s mobilization curve, it seems extraversion (or possibly a combination of extraversion and agreeableness) correlates with the ‘willingness to join’ the movement (the x-axis). Those high in extraversion are so ‘willing to join’ that they start. Those with more moderate levels of extraversion have a
medium threshold to join. Those with low levels of extraversion have a very low ‘willingness to join’ and too many of these individuals hampers the possible success of a movement. A high ‘minimum’ value for any given round suggests that there are lower numbers of people with higher thresholds, which seems to be associated with a higher likelihood of a round being funded. Mean extraversion was also significant, suggesting again that generally high numbers of extravert people in a group is associated with a higher chance of a round being funded. We did not, however, find similar results for internal locus of control, neither were the ‘minimum’, ‘maximum’ or ‘mean’ levels of ‘agreeableness’ (or any of the other personality variables) associated with the likelihood of a round being funded.

Discussion and Conclusion

We have identified heterogeneity in our experimental subjects in their willingness to join a collective action at an early stage, when there is little or no evidence that other people will join or that the common goal is likely to be attained. That is, some people were willing to start a mobilization more than once, some joined mobilizations only during the later stages and most varied their behaviour across a middle range. We have also identified that for a substantive subset of subjects in our experiment, the rank at which they join is consistent, and we found most evidence of this consistency at the early and late stages. That is, we identified some people with consistently low thresholds, and some with consistently high thresholds. These findings confirm our first hypothesis, H1.

We have also made some steps towards identifying the personality characteristics associated with low or high thresholds, although not for all the personality variables that we investigated in our analysis. Social value orientation, for example, seems to be unrelated to people’s propensity to start, in spite of the strong relationship between this variable and contribution amount (and also susceptibility to social influence) identified in our previous work. In contrast, internal locus of control appears to be positively associated with a willingness to start, as does extraversion. And agreeableness is positively associated with a tendency to go late in the mobilization, suggesting that agreeable people wait until it is clear that the mobilization will be funded (that is, that more than half the necessary number have contributed) before
joining themselves. None of the other ‘Big 5’ personality variables investigated were significantly associated with threshold. These findings confirm H2a (for internal locus of control) and H2c (for extraversion, with the additional findings for agreeableness), but H2b (for social value orientation) is rejected. The findings for extraversion to some extent chime with the earlier work on personality and leadership reviewed in the second section, but in fact our findings are stronger and less equivocal than the earlier work. It may be that our results derive from extraversion being best suited to the ‘starting’ element of leadership, and less so to the other activities required for leading in offline contexts, which require other dimensions of personality.

We also investigated the relationship between the concentration of these personality traits in a subject group, and the likelihood of a round getting funded. We found a positive association for one of them, extraversion, suggesting that a mobilization with lower numbers of people with low extraversion (and conversely, higher numbers of people with higher levels of extraversion) has a higher chance of success.

These findings contribute to the body of work on thresholds in collective behaviour discussed briefly above. The much earlier work by Schelling and Granovetter discussed in the first section assumed that different individuals have different thresholds and based their models on this assumption. They did not investigate why individuals have the thresholds that they do, or what types of people have which types of threshold. In contrast, we have attempted to verify empirically the claim that people have different thresholds, and to identify the relationship between personality traits and the threshold at which people are willing to act collectively.

We have thereby gone some way towards answering the question posed in the introduction to the paper: why do some mobilizations succeed, while most fail, even by the most modest definitions of success? It is clear, from statistical analysis of the mobilization curves shown in Figure 1, that the number of people joining in the early stages, when there is no information about whether other people will join, is crucial. These are likely to be people with low thresholds, and our findings suggest therefore that they will be people with high levels of extraversion and a high internal locus of control. These are the type of people who are most likely to ‘start’ online mobilizations with collective goals, such as signing a petition and
existence of sufficient numbers of these type of people will be one of the necessary conditions for getting an online mobilization off the ground. These would be the people most useful to ‘target’ in the early stages of a mobilization; these individuals are essential to build a critical mass and make the movement appear to be viable. Both Schelling and Granovetter modelled the differential effects of different types of distribution of thresholds on collective outcomes, allowing them to predict what type of distribution would lead to successful mobilization. We cannot attempt to make any claims here as to what the distribution of thresholds might be in any given context, as our findings are based on experimental data that did not purport to be a representative sample of any population. However, having made an association between threshold and extraversion in particular, these findings suggest that future research aimed at understanding the distribution of thresholds might include secondary analysis of research into the distribution of extraversion or locus of control in different populations.
Figure 1. Petitions submitted to No.10 Downing Street E-petitions Site, Sept. 2009 - May 2010

Source: Data from No.10 Downing Street E-petitions site, Sept 2009 to May 2010 (N= 8,326 petitions)

Figure 2. Schelling’s Participation Curve

Source: Schelling (1978; 2005)
Figure 3. Distribution of minimum, median and mean rank of subjects the number of times subjects start a round

Figure 4: Average rank and standard deviation of rank per subject

Note: The best fit line is a locally weighted scatterplot smoothing (LOWESS) line with a 95% confidence interval shaded around the line.

Figure 5: Correlation Matrix for Personality Measures

<table>
<thead>
<tr>
<th></th>
<th>Extravert</th>
<th>Agreeable</th>
<th>Conscientious</th>
<th>Emotionally Stable</th>
<th>Open</th>
<th>Rotter Score</th>
<th>Individualistic</th>
<th>Cooperative</th>
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Figure 6. Tobit regressions showing relationships between threshold measures & personality traits

a. Rotter Score

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* p<0.05, ** p<0.01, *** p<0.001

b. ‘Big 5’ Personality Traits

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* p<0.05, ** p<0.01, *** p<0.001
### Figure 7: Round level regressions

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* p<0.05, ** p<0.01, *** p<0.001
References


Backstrom, L. (2011) ‘Anatomy of Facebook’, *Facebook Data Team’s Notes*,


