

7-11-2018

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Repository Citation

Wang, A. H., Chen, F. (2018). Extreme Candidates as the Beneficent Spoiler? Range Effect in the Plurality Voting System. *Political Research Quarterly* 1-15. Sage and Open Access.

<http://dx.doi.org/10.1177/1065912918781049>

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Extreme Candidates as the Beneficent Spoiler? Range Effect in the Plurality Voting System

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Abstract

How does the entrance of radical candidates influence election results? Conventional wisdom suggests that extreme candidates merely split the votes. Based on the range effect theory in cognitive psychology, we hypothesize that the entrance of an extreme candidate reframes the endpoints of the ideological spectrum among available candidates, which makes the moderate one on the same side to be perceived by the voters as even more moderate. Through two survey experiments in the United States and Taiwan, we provide empirical support for range effect in the vote choice in the plurality system. The results imply that a mainstream party can, even without changing its own manifesto, benefit from the entrance of its radical counterpart; it explains why the mainstream party may choose cooperation strategically. Our findings also challenge the assumption in regression models that the perceived ideological positions of candidates are independent of each other.

Keywords Extreme Candidate, Range Effect, Extremeness Aversion, Survey Experiment, Taiwan Politics

Introductionⁱ

The emergence of radical wing candidates in electoral races has become a global phenomenon in recent times.ⁱⁱ For example, the UK Independence Party (UKIP) in the United Kingdom, National Front (FN) in France, and the China Unification Promotion Party in Taiwan all evidenced the extension of existing ideological spectrums in each country (For review, see Kitschelt and McCann 2005, or Mair 2007). This study investigates the effects of extreme candidates' appearance in electoral contests, especially regarding how they influence supporters of the mainstream parties.

Traditional theories of voting behavior suggest that people vote for candidates who are closer to themselves on the ideological spectrum. According to the spatial models, the entrance of extreme left or right wing candidates into electoral races does nothing more than splitting the vote from their moderate counterparts. For instance, many people still blame Ralph Nader as the spoiler candidate who caused Al Gore's defeat to George W. Bush in the 2000 presidential election (Herron and Lewis 2007).

However, mainstream parties' reactions vary considerably to the entrance of extreme candidates. Some mainstream parties diverge from the median point to prevent the entry of a new party (Palfrey 1984). After all, it is easier for mainstream parties to appease and to absorb newcomers, for example by including candidates with diverse backgrounds in the party list or providing more credible promises. On the contrary, other mainstream parties do not necessarily try to block those radical competitors on the same side of the political spectrum. Are these radical wing candidates harmful or beneficent to the mainstream parties, especially to those on the same side?

Studies of cognitive psychology indicate that individuals' preference is context-dependent, primarily influenced by the range of options (Parducci 1965). While the stimuli

— a new option — becomes available, individuals will re-access the end values first, and accordingly evaluate the stimuli as well as the existing options. The range effect has been found in various fields such as psychophysics (Laberge and Brown 1986) and marketing (Simonson and Tversky 1992).

With the rise of the extreme parties and candidates in the recent decades, the range effect also draws attention to political scientists. Simonovits (2017) shows that the appearance of non-moderate policy options reshapes the subject's preferences among the existing policies. Furthermore, Waismel-Manor and Simonovits (2017) find that, in the context of Israeli general election, voters consider the full spectrum of candidates and parties in the competition, while the entrance of radical candidates will change the respondents' perception on the existing actors.

Our study continues to answer several essential puzzles regarding range effect and voting behavior. Importantly, we examine whether the range effect appears in different institutional contexts. We propose to study the range effect in another essential and generalizable setting: the two-party system in the single-member-district (SMD). Intuitively, the competition in SMD is similar to the original study of range effect and many other related experiments: two main rivals and a third incoming competitor. Therefore, testing the range effect theory in a two-party system does not need extra assumptions such as the number of existing competitors in the Israeli case in Waismel-Manor and Simonovits (2017).

By conducting survey experiment in two countries with similar electoral and party systems, the United States and Taiwan, we show that the entrance of a politically radical candidate can be, contrary to conventional wisdom, beneficial to their mainstream

counterpart in specific scenarios. Even though an extreme candidate may split votes among radical supporters, their entrance into an electoral contest also stimulates “extremeness aversion effect” (Simonson and Tversky 1992; Tversky and Simonson 1993) among the moderate voters, which may increase the vote share of the mainstream candidate on the same side.

Our empirical results challenges (again) the independence of irrelevant alternatives (IIA) assumption implicitly acknowledged in the spatial models and multinomial regression models. Besides, the results also reveal a possible strategy that a major party prefer: cognitively changing voters’ perception toward it *without* changing its policy stance practically.

Range Effect, Extremeness Aversion, and Spatial Voting

When making choices, individuals’ preferences are contextual-dependent. People do not evaluate each option independently nor assign constant utility to each of them. Instead, people often make comparisons among the available options in the choice set, which is called range effect (Parducci 1965). Based on this cognitive psychological mechanism, studies in various fields have shown that the range effects do exist (e.g., Laberge and Brown 1986; Yeung and Soman 2005).

In many cases, individuals tend to make extremeness-averse choices: when a third extreme choice becomes the new endpoint on one side, subjects re-evaluate the existing option at the same side as more moderate (Simonson and Tversky 1992). It is worth noticing that this influence is *asymmetric* - the new extreme option would influence only the moderate option on the same side, but not the other one which is still the other endpoint of the spectrum.

We argue that the similar psychological mechanism can be found when voters are evaluating among candidates, especially under SMD. SMD is closer to the experimental settings in the psychology literature than that is in PR. When a radical left or right wing candidate or party decides to run in the election and challenge the existing two-party competition, it resets the new reference point for the ideological spectrum among options already on the ballot. When comparing three candidates, the extreme candidate anchors voters' attitude formation process. Since the extreme candidate and the moderate candidate on the opposite side become the two new endpoints, voters would consider the moderate candidate on the same side of the political spectrum as the extreme candidate as more moderate. Likewise, the entrance of an extreme candidate would *not* influence voters' evaluation on the mainstream opponent since the mainstream opponent is still one of the endpoints among available options before and after the entrance of the radical candidate. Following the similar logic of spatial voting, the subjective perception shift would increase the vote share of this intermediate option among the moderate voters but decrease among the radical voters on the same side of the political spectrum.ⁱⁱⁱ

Indeed, the range effect has been found in recent political science studies. Simonovits (2017) designed six survey experiments and asked respondents to evaluate immigration, welfare, abortion, and minimum wage policies. By introducing the extreme alternatives, Simonovits shows that respondents tend to perceive the moderate policy on the same side as much more moderate. Waismel-Manor and Simonovits (2017) also find a similar effect in Israel politics. When respondents are asked to evaluate the ideological stance of potential prime minister candidates in 2009 and 2015, whether an extreme candidate is asked to be evaluated in the same task will impact on how the respondents

evaluate other moderate candidates. To be specific, a moderate prime minister candidate will be viewed as more centrist when an extreme candidate enters the task and appears next to the moderate one.

In this article, our first extension is to put the treatments into another realistic setting – candidate bulletin in congressional elections. All policies are carried by a partisan candidate, and respondents are asked to evaluate the candidates' overall stance.

Second, Israel applies PR system with ten parties participated in 2015 general election. The real politics in Israel is more complicated than the experimental setting in which it must simplify the total number of parties and candidates in the races, issue dimensions. The experiment also implicitly assume that people make voting decision mainly based on the ideological stance of party leaders. At the end of their research, Waismel-Manor and Simonovits also mentions that “...*the recent developments in majoritarian systems...suggests that contextual effects are not limited to proportional systems with many parties.*” Our study can further extend the study of range effect in another essential institutional setting.

Admittedly, the radical challenger is less likely to rise and challenge the mainstream party under SMD. Duverger's Law indicates that people tend to avoid wasting their votes on small parties that have little hope to win. However, various successful radical newcomers challenge the conventional wisdom. For example, in Taiwan, UK, and the primary elections in the United States, radical wing candidates rapidly emerge, and some even acquire seats in different levels of elections. Therefore, it is essential to explore the causal mechanisms behind the phenomenon: how the range effect influences the dynamics between the mainstream and radical candidates.

Our third extension is to capture the range effect beyond the traditional left-right spectrum. As we have argued, if such psychological effect exists in the political arena, it should also appear in the place where other issue dimensions dominate.

Case Selection

To examine the range effect in the political arena, we designed two survey experiments in two democracies embedded in two distinct political cultures: the United States and Taiwan. Taiwan and the United States both have presidential elections and first-past-the-post voting for the heads of local governments as well as district-level national legislators. These shared characteristics may provide us with the opportunity to examine and compare the generalizability of our findings.

Our first experiment was conducted in the United States concerning the liberal-conservative spectrum. Since the US had a well-developed bipartisan system and SMD rule, it fits our theoretical requirement. Besides, the primary political spectrum in the United States has been constructed along with the liberal-conservative spectrum in recent decades (Poole and Rosenthal 2001; McCarty et al. 2005). However, some studies using American subjects in cross-sectional surveys find a weak range effect because there can be, to some extent, multiple policy issues present in each presidential election (see, e.g., Herne 1997; Mebane Jr. and Waismel-Manor 2005). Some researchers argue that the multi-dimensional competition influenced people's judgment on the extremeness of the candidates. Still other studies also directly challenged the assumption of the single-dimensionality in the United States (e.g., Feldman and Johnston 2014).

Since the range effect theory is based on available options in the choice set, our experimental design would better follow the unidimensional setting. Even though the

unidimensional design may not capture the full picture of what people think, Bafumi and Shapiro (2009) found that the self-reported liberal-conservative ideology performs relatively well on explaining vote choice and other policy preferences in the U.S. context, especially in recent years.

That is also why we chose Taiwan as a comparable case – the issue dimension in the Taiwan election is much more clear and consistent. In Taiwan, people’s preference on future national status—the unification-independence division, or more directly, the attitudes toward China—has been the central divide of Taiwanese politics for decades. The division dominates all other policy debates and outweighs any discussion regarding social justice or economic development (e.g., Achen and Wang 2017). Taiwanese voters only access candidates on a single spectrum concerning the unification-independence issue.

At the same time, the political context and the recent development in Taiwan politics make Taiwan an even better case to test the range effect in real politics. In 2012 Taiwanese presidential and legislative elections, Democratic Progressive Party’s (DPP hereafter) presidential candidate Tsai Ing-Wen asked DPP supporters to “share some votes” in the concurrent legislative election with the Taiwan Solidarity Union (TSU hereafter), the extreme pro-independence party in Taiwan. It seemed irrational for DPP to make such decision since DPP can absorb all of the votes on the pro-independence side. Since DPP had not possessed the majority in the Congress in 2012, seat maximization would be the most rational strategy. TSU turned out to collected 9% of votes and three proportional representation seats in the legislative election and became the third largest party in 2012. Tsai was defeated by the incumbent Ma Ying-Jeou from the Kuomintang (KMT hereafter). It is believed that Tsai’s loss could be attributed to people’s perception of her pro-

independence attitude on the cross-strait relationship with China, even though she claimed that she espoused the moderate position (Sullivan 2013).

In 2016 presidential and legislative elections, DPP cooperated closely with another extreme pro-independence party, the New Power Party (NPP) - which has emerged after the Sunflower Movement in 2014 - to run in the legislative election in some single-member districts (Hickey and Niou 2017). Besides, in some districts, both DPP and other small parties with similar pro-independence preference nominated their own candidates, respectively; but Tsai did not openly criticize these potential conflicts (Fell 2016).

Tsai ran again in the 2016 presidential election. Compared to her previous run, her stance on cross-strait relationship remains unchanged in a substantive sense; that is, she tries to move toward the median and preserve the "status quo" in the cross-Strait relations, which is close to KMT's position. However, according to the Taiwan National Security Survey conducted in 2015 by the Duke University Program of Asian Security Studies,^{iv} 65.3% of Taiwanese people believed that the tension between China and Taiwan would not rise even if Tsai and DPP win the 2016 elections. Compared to perceptions from previous years, Taiwanese people believed DPP as more moderate in 2016. In this case, range effect may help explain the DPP's strategy and Tsai's eventual electoral victory.

One may question that the focus on candidates and parties is not identical.^v Indeed, our two experiments are candidate-centered, which is the typical scenario in SMD. However, the policy stance and campaign of a party are usually determined by the party leader or caucus, especially when there is a concurrent election (Taiwan started to hold the presidential and legislative election concurrently since 2012). Even though we test the range effect at district-level, we argue that the party leaders would consider how the policy

stance of their party will influence their vote share across the districts in general. In other words, range effect in the district may be accumulated and influential to the national politics.

Research Design and Data Collection

Survey experiment is needed for clarifying causal relationships between range effect and voting behaviors. If we analyzed the election results by ad hoc surveys, it would be difficult to identify how the mainstream parties and their smaller counterparts interact with each other. To be specific, the major party may actively shift toward the center and suffered the blame for inconsistency *before* the entrance of a politically extreme party. Also, the new parties may try their best to create new issue dimension (Meguid 2015) which stirs the one-dimensional competition dominated by the two mainstream parties. Furthermore, people would perceive radical candidates (or parties) differently based on their position on the ideological spectrum, which weakens our examination in a theoretical perspective. For example, there are continuing debates whether Ralph Nader and Pat Buchanan are extreme candidates or not (e.g., Herron and Lewis 2007; Magee 2003). Hence, an experimental design is helpful on clarifying the mechanism.

US subjects, MTurk, and the Congressional Election

To deal with these empirical challenges, we designed two survey experiments. One experiment was conducted through Amazon MTurk on July 15-20, 2016. Subjects need to be over the age of 18, using a US IP address and have a 95% approval rating or higher for previous hits. Subjects were invited to participate in a survey related to politics and lifestyle and would receive \$1.25 after completion. Overall, 509 subjects were recruited through Amazon MTurk, even though in our announcement we only asked for 500. Table 1 shows the socio-demographic background of the Mturkers in the first experiment. Generally

speaking, the MTurkers we recruited are young, highly educated, non-black, and pro-liberal. Before the treatments, subjects were asked to locate their ideological position on a 0 to 100 scale from extremely liberal (0) to extremely conservative (100). Therefore, their self-report position was not influenced by our research treatments.

[Table 1]

Subjects were firstly asked to report their routine political behaviors including news consumption, political interest, and political discussion. Before the treatment, they were asked to locate their ideology on a 0 to 100 liberal-conservative scale. After asking participants to self-report ideology, we put an attention check item before the primary treatment to filter out inattentive subjects. The item apparently asks subjects to report their mood, but actually requires them to select "none of the above" in the last sentences of the item description. This method is proven to successfully increase the quality of data and enhance the attention of subjects on Internet surveys (Oppenheimer et al. 2009; Berinsky et al. 2014). Overall, 499 (98.03%) of our 509 subjects passed the attention check, and those who failed (10, 1.97%) were dropped from the analysis.

Subjects were then randomly assigned into three different groups. In the Control Group (n=100), they were asked to read the candidate bulletin of one Congressional election including one Democratic and one Republican candidate (See the supplemental material file). The Democratic Party and Republican Party are the two major parties dominating U.S. politics and are respectively seen as representing a liberal and conservative ideological stance. On the bulletin, each candidate had three policy statements

created by the researchers. For the Democratic candidate, his statement included progressive tax, minimum wage, and gay rights. For the Republican candidate, his statement included abortion only for rape, tax cuts, and lower regulation on businesses.

The policies of all candidates we used in the U.S. experiment were generated from a pilot survey from 58 political science undergraduate students. Students were asked through open questions to nominate one policy they would describe as "extremely liberal," "moderate liberal," "extremely conservative," and "moderate conservative," respectively. Students received course credits after completion. The policies nominated more than ten times by students in each category were selected as candidates' policy statements. Since we wanted to enhance the external validity of our experiment, wordings of the policies are extracted from speeches that politicians made or policy statements that were announced on candidates' official websites.

Apart from party and policies, candidate's name, age, level of education, photo, and ballot position were all randomized. All candidates were middle-aged white males; in the 2014 election cycle, 75% of all candidates running for office were male, and 82% were white.

In *Treatment Group A* (n=200), the bulletin includes three candidates: Republican, Democratic, and Independent. The extreme conservative (**Ext-Con**) independent candidate's three policy statements included relaxing gun ownership, free market on health-care, and ending abortion. In *Treatment Group B* (n=198), the extreme-liberal (**Ext-Lib**) independent candidate supported universal single-payer health care, free tuition to all college students, and women's full right to reproductive choice. Wordings of the extreme candidates' policy statements are extracted from the Libertarian Party and the Green Party

in the U.S., respectively. Subjects in control and treatment groups were then asked to judge the liberal-conservative positions of the two or three candidates on a 0-100 liberal-conservative scale. Their vote choice among the candidates was also asked.

After the treatment, subjects were then asked to report their party identification, political participation, belief in democracy, and previous experience on political engagement for other research propose. In the end, subjects were asked about their gender, age, race, the level of education, and household income. We do not expect the treatments would influence one's report on its previous political behaviors or demographic background because the question is related to experience or fact instead of attitude. These variables were then used for the randomization check and covariate adjustment. After the survey, all subjects were debriefed that the assigned candidate bulletin was entirely made up by researchers.

Taiwan subjects, PTT, and the Legislative Elections

To examine the external validity of range effect, our research design in the second survey experiment in Taiwan is almost parallel to the former one. This survey experiment was conducted on March 19-31, 2016, two months after its presidential election. The recruitment ads were posted on PTT Bulletin Board System, the biggest online discussion forum in Taiwan.^{vi} Subject needed to be over 18 and living in Taiwan. Subjects were invited to participate in a survey related to politics and lifestyle, and would join the lottery for 30 convenience store gift cards valued NTD \$100 (about USD \$3) after completion. Overall 427 subjects were recruited on PTT. Table 2 shows the socio-demographic background of respondents in the second experiment. As is discussed above, the majority of our Taiwanese respondents are young, highly educated, and self-reported pro-independence before the treatment.

[Table 2]

Subjects were first asked to report their routine political behaviors including news consumption, political interest, and political discussion. They were then requested to evaluate their attitude toward independence-unification on a 0-100 scale in which 0 means pro-unification, and 100 means pro-independence. Again, we put an attention check item before the main treatment to filter out inattentive subjects. Subjects who failed to answer this item correctly (17 in 427, 3.98%) were dropped from further analysis.

After the attention check, subjects were randomly assigned into three different groups. In Control Group, subjects were asked to read an election bulletin of legislative election including a KMT and a DPP candidate (see the supplemental materials file). All candidates were male, around 50 years old, and with an average bachelor degree. Each candidate enumerates four policy statements: the former two are related to reform the long-term care health system and housing prices, and the latter two are related to their attitude toward the cross-strait relationship between Taiwan and China - the only dominant issue in Taiwan. Once again, wordings of the policies were copied from real election bulletins in Taiwan. The KMT candidate is designed to express a moderate pro-unification attitude, while the DPP candidate is designed to express a moderate pro-independence attitude. Subjects in Control Group were asked to read through this electoral bulletin, and use the same 0-100 scale to locate the perceived ideological position of these two candidates. Respondents were also asked about their vote choice between these two candidates.

In Treatment Group A, an extreme pro-independence candidate from the TSU was added to the bulletin. His socio-demographic background and social welfare policies are

similar to the two moderate candidates, but his cross-strait policies include rejecting interaction with China and immediately initiating constitutional reform to acquire de jure Taiwan independence. In Treatment Group B, in contrast, an extreme pro-unification candidate from the New Party (NP) is added. His cross-strait policies are about reunification with China and repressing the voice of independence. Wordings of these policy statements usually appear during the campaign process as well as in online political discussion. Subjects in Treatment Group A and B were also asked to locate the three candidates on the 0-100 scale, and about their vote choice. After the treatment, all subjects were asked to report their socio-demographic background and were debriefed after completion.

Data Analysis

Study 1: US Sample and Liberal-Conservative Spectrum

Before comparing among control and treatment groups, randomization check is used to ensure the comparability. ANOVA test shows that there is no difference among subjects in the three groups on their age ($p = 0.87$), gender ($p = 0.64$), educational level ($p = 0.20$), race ($p = 0.56$), income ($p = 0.77$), importance of religion ($p=0.13$), and self-reported ideology position ($p = 0.96$). To sum up, we can simply compare the group means to estimate the average treatment effect (ATE). To improve the precision of estimation and conduct covariance adjustment given the large size in our sample, we follow the suggestions given by Freedman (2008) and Lin (2013). We use regression adjustment, which includes demeaned covariates and their interactions with the two treatment dummies, which yields unbiased estimation but improves precision asymptotically. All of the analyses below are calculated and plotted by R 3.1.3, and all codes and data will be publicly replicable on the author's website.

Figure 1 shows how US subjects in each group locate the two or three candidates' ideological position after reading the election bulletin. The distributions are the density plot, while the dashed lines are the median value since the distributions are skewed. First of all, in the control group, subjects perceived the two candidates are located in 20 and 81, respectively. Their judgment is based on the policy statements of the candidates. In Treatment Group A, the extreme conservative candidate is scored 95 as its median, while in Treatment group B the extreme liberal candidate was scored 17. The distributions and the medians provide confidence on the internal validity of the treatments.

[Figure 1]

Figure 1 illustrates the range effect in the politics. Comparing the control group in the first row and the Treatment Group A, subjects' perceived ideological position of the moderate conservative (Republican) candidate changed from 81 to 71, which is more moderate. Two sample t-test shows that the change in means of the moderate conservative candidate is significant ($p < 0.001$). Meanwhile, the subject's perceived policy position of the moderate liberal (Democratic) candidate remains unchanged (20 to 20, $p = 0.49$). The same pattern, albeit insignificant, can be found when comparing the control and Treatment group B. The entrance of the extreme liberal candidate makes subjects' attitudes toward the moderate liberal one more moderate, albeit not statistically significant (from 20 to 23, $p = 0.51$; the difference is nearly significant between Treatment Group A and B, from 20 to 23, $p = 0.12$). At the same time, the subject's attitude toward the moderate conservative candidate remains unchanged (81 to 84, $p = 0.83$).

To adjust for possible randomization failure from covariates including respondents' socio-demographic background, and owing to the boundary of the scale (0 to 100), we use Tobit regression to estimate the ATE of the entrance of extreme liberal and conservative candidate.^{vii} In Table 3, the first and the fourth model estimate how the **Ext-Lib** and **Ext-Con** influences subjects' perceived policy position regarding the moderate liberal and conservative candidate, respectively. In the second, third, fifth, and sixth model, we apply covariance adjustment by adding the interaction term between the two treatments and the demeaned age, gender, educational level, income, race, the importance of religion, and self-reported ideology (before treatment). Also, the third and sixth model only use moderate subjects, which is defined by those who self-reported ideology is relatively moderate - between 40 and 60 - which accounts for 20.9% of our MTurk samples.^{viii}

[Table 3]

The result, generally speaking, is consistent with Figure 1 and supports the range effect theory. The entrance of the extreme conservative candidate **Ext-Con** would make voters view the Mod-Con candidate as more moderate. The average treatment effect is about -7.3 for all participants, and -18.8 among the ideologically moderate participants! This change is even more significant than the pure policy treatment in the previous study (about 10% in Simonovits (2017)).^{ix} This result also suggests that the moderate voters will have an extremeness aversion tendency toward the new extreme candidate, and consider the moderate counterpart as much more moderate.

Meanwhile, the effect of **Ext-Con** on the perceived **Mod-Lib** candidate is trivial. In comparison, the impact of the entrance of **Ext-Lib** is not that clear on the full sample. If we narrow our focus to the moderate participants, the estimated effect of **Ext-Lib** becomes significant (+10.07, $p < 0.1$). Apart from the treatment effect, our regression models provide little help on improving the precision of our estimation; comparing model 5 and 6 implies that the standard error of the uncontrolled models do not reduce significantly, which suggests that the randomization process does not fail.

Most importantly, the effects of the two treatments are both *asymmetric*; the entrance of the extreme liberal candidate *only* influences participants' attitude toward the moderate liberal one, and the entrance of the extreme conservative candidate *only* influences the participants' perception toward the moderate conservative counterpart. This asymmetry is consistent with range theory owing to the two-end-point assumption. Moreover, the policy statements of the two moderate candidates remain the same in the control and treatment group; that is, voters change their perception on the moderate candidate simply because of the entrance of the extreme candidate. Our experimental design helps clarify the causal relationship.

The limited finding for the entrance of **Ext-Lib** may owe to three reasons. First, our treatment was imperfect. The median value of the perceived **Ext-Lib** candidate position is 17 in Figure 1, which is not far from the **Mod-Lib**. In other words, our treatment is not the most extremely liberal candidate in the eye of our opted-in participants. The extreme and moderate policy statements we used are from the pilot survey among political science undergraduate students. It can be possible that undergraduate students and MTurkers use different standards for evaluating the extremeness of particular policies. A pre-test on the

MTurker should have detected this problem. Second, because the majority of our subjects lean towards liberal views, it can be possible that they already know the moderate and extreme candidates are on their side of the political spectrum too well. Therefore, our treatment partially fails to create a new endpoint in their mind. Third, many important policy issues include multiple facets. Our definition of liberal and conservative may be different from our subjects to some extent (Feldman and Johnston 2014). Therefore, many people do not perceive the extreme liberal treatment as we expected.

Next, we provide the cross-table between treatment group and voter's self-placed position on the liberal-conservative spectrum. The cross-table is used to examine the extremeness aversion phenomenon. The cut-points for ideological groups are 40 and 60, same as the previous analysis. In each cell, the first value is the percentage of votes that the Mod-Lib candidate received, the second is how much the Mod-Con candidate received, while the third value is what the extreme candidate in each treatment group received.

Table 4 provides some support to the extremeness aversion theory. Among the conservative subjects, the entrance of **Ext-Con** lowers their support to the moderate conservative candidate from 88% to 73%; the effect of **Ext-Lib** on Mod-Lib is even larger: from 100% to 37%. It is not surprising that the entrance of radical candidate will split the votes from its moderate counterpart among the voters on the same side.

When it comes to moderate subjects, the entrance of **Ext-Con** increases moderate voter's support to the Mod-Con candidate (from 27 % to 30%, the colored cell in Table 4), but decreases their support toward the Mod-Lib (from 73% to 68%). To some extent, The change is good news to **Mod-Con** candidate - the extremeness aversion effect helps **Mod-Con** narrow the relative strength of **Mod-Lib** among the moderate voters. However, the

change did not appear in the full sample, which may be because the number of moderate voters in our sample is not enough (20.7%).

[Table 4]

Meanwhile, the entrance of **Ext-Lib** does not help the **Mod-Lib** nor the **Mod-Con** candidate in our research design. Instead, the majority of our participants choose to vote for the **Ext-Lib** in the treatment group. This failure may be attributed to the failed treatment as is shown in Figure 1. Besides, it can also be the case that all candidates were designed to graduate from a law school located in the southern part of United States. Graduating from a southern university may imply its possibly right-wing position. Another possibility may be from the multidimensionality of the ideology in the U.S. context. Therefore, even though the entrance of extreme candidate may successfully influence voter's perception of the moderate candidate, as is evidenced in Table 3, their vote choice is worth further exploring.

Study 2: TW Sample and Independence-Unification Spectrum

One weakness in our U.S. experiment is the imperfect treatment which was not strong enough to serve as an "extreme candidate." Indeed, the policy statements used in treatment may have multiple facets, so subject may be framed or may put different weights on each facet. To deal with the issue complexity, we replicated the same experiment in Taiwan, where the independence-unification issue is the only dominant dimension. Under this particular context, we expect to find more unambiguous evidence on range effect in the political arena. Before the analysis, the randomization is checked through ANOVA, as

was applied in the study 1. To improve the precision of the estimated ATE, we also use Tobit regression to adjust for covariates.

Figure 2 shows how Taiwanese subjects in each group locate the two or three candidates' cross-strait attitudes. The distribution of the two extreme candidate evidence that our manipulations are both effective: the extreme pro-independence candidate from TSU was scored 95.5 as its median, while in the Treatment group B, the extreme pro-unification NP candidate was scored 3.

[Figure 2]

Once again, Figure 2 illustrates the range effect under the context of Taiwan politics. Comparing the control group in the first row and the Treatment group A, Taiwanese subjects' perceived policy position of the moderate pro-independence candidate shifted from 71.5 to 65, which is more moderate. Two sample t-test shows that the change in means is significant ($p < 0.001$). Meanwhile, the subject's perceived policy position of the moderate pro-unification candidate remains unchanged (from 31.5 to 30, $p = 0.51$). The exact same phenomenon can be found when comparing the control and Treatment group B. The entrance of the extreme pro-unification candidate makes subjects' attitudes toward the moderate one on the same side to be much more moderate (from 31.5 to 38). Two sample t-test shows that the shift is statistically significant ($p < 0.001$). At the same time, subjects' attitudes toward the moderate pro-independence candidate remain unchanged (from 71.5 to 74, $p = 0.92$). The result in Figure 2 indicates that the range effect exists in democracy across cultures.

Tobit regression model then is used to estimate the ATE of the Treatment A and B and adjust for covariates (including age, gender, income, level of education, and self-report policy preference before the treatment). Demeaned covariates and their interaction with the two treatments are added to the models. In Table 5, the first two regression models are subjects' perceived policy position on the moderate pro-independence DPP candidate (**Mod-Ind**), while the third and fourth regressions are for the moderate pro-unification KMT candidate (**Mod-Uni**).

Results in Table 5 are consistent with Figure 2 and the predictions of range effect theory. First, the entrance of the extreme pro-independence **Ext-Ind** TSU candidate make voters view the **Mod-Ind** candidate as more moderate, but the null effect is found on the **Mod-Uni** candidate who is on the opposite side of the policy spectrum. Similarly, the entrance of the **Ext-Uni** NP candidate only makes the **Mod-Uni** candidate as more moderate, but no effect is found on **Mod-Ind**. The entry of the extreme candidate asymmetrically influences the image of the moderate candidate on the same side, but not the moderate one on the opposite side, which is predicted by range effect theory. Moreover, the policy statements of the two moderate candidates remain the same in control and treatment group; that is, voters change their perception of the moderate candidate because of the entrance of the extreme counterpart. What's more, in the second and fourth model, covariate adjustment provides little help to improve the estimation of ATE.^x

[Table 5]

Table 6 shows Taiwanese subjects' vote choices under different treatment groups. The ideological group is defined by the median value of the perceived moderate candidate

in the control group: 31.5 and 71.5.^{xi} In each cell, the first value is the percentage of votes that **Mod-Uni** candidate received, the second is what **Mod-Ind** candidate received, while the one in the parentheses is what the extreme candidate received.

[Table 6]

Results in the column of moderate respondents partially support range effect theory. When **Ext-Ind** candidate was in, the percentage of moderate voters supporting the **Mod-Ind** candidate increased from 58% to 64% ($p=0.08$). Unfortunately, the similar effect is not found in Treatment group B. The null finding in Treatment group B may be because that among the moderate subjects we defined, 62% of them placed their position larger than 50. Thus, even though they perceived that Mod-Uni candidate becomes more moderate when an **Ext-Uni** candidate joins the race, the change is not enough to attract them. Third, the entrance of **Ext-Ind** candidate seriously drew the vote share of a **Mod-Ind** candidate from 91% to 46% among the pro-independence voters, and **Ext-Uni** candidate makes the vote share of **Mod-Uni** KMT candidate slump from 100% to one-third. Comparing the results among all Taiwanese voters between the Control group and Treatment A, it shows that the moderate pro-independence candidate lost a lot among the pro-independence supporters, but he also gained some from the moderate voters, which still ensures his winning and meanwhile further marginalizes his main competitor, the moderate pro-unification candidate (whose support rate dropped from 23% to 12%).

The Motivation of the Mainstream Party: A simulation

In the two experiments, one of our primary weaknesses is that the number of voters in each cell in Table 4 and 6 is very low and skewed, which prevents us from further

inference. However, through Tobit analysis in Table 3 and 5, we showed that the entrance of extreme candidate could asymmetrically influence voters' perception of the moderate candidate on the same side. Thus, we should expect to find evidence that the major party will be motivated to allow the entrance of a radical party if we extend the range effect to the whole population. To illustrate the motivation of the major party (such as DPP's willingness to share some seats and votes to the small parties), we combine the clearer result from Taiwanese subjects in Figure 2 (perceived candidate positions), and the proximity voting assumption to simulate the mainstream party's calculation.

In the beginning, voters are assumed to be uniformly distributed in the unification-independence dimension. Second, the two median values of perceived **Mod-Ind** and **Mod-Uni** candidate's position in the first row of Figure 2 (the control group), 31.5 and 71.5, serve as cutting points separating pro-unification, moderate, and pro-independence voters. Third, we simulate the number of moderate voters from 0% to 100%, and the number of pro-unification and pro-independence voters are proportional to the lengths. We assume that all voters follow the proximity paradigm, indicating that they will vote for the candidate closer to them in the policy spectrum (Tomz and Van Houweling 2008). For example, when all voters are moderate voters, the **Mod-Ind** candidate can gain 50% of votes; when no voter is moderate, the **Mod-Ind** candidate can gain all votes on the right side of her, indicating $100\% \times \frac{100-71.5}{100-71.5+31.5} = 47.5\%$.

When the **Ext-Ind** candidate chooses to join the competition, we use the result in the second row of Figure 2 to estimate the change of vote share among all candidates. In particular, the focus is on how the entrance of **Ext-Ind** influences the vote share of **Mod-**

Ind, the moderate candidate on the same side of the political spectrum, under different numbers of moderate voters.

Figure 3 shows the simulation of **Mod-Ind** candidate's vote share under different numbers of moderate voters in the district, based on the result of Figure 2 and the assumption of proximity voting. When there is no **Ext-Ind** candidate, the Mod-Ind candidate can earn 47.5% to 50% of the vote-- she can, at most, tie the election and may lose to **Mod-Uni** candidate in most possible scenarios. However, when the **Ext-Ind** candidate jumps into the election, the Mod-Ind candidate will be perceived as much more moderate, and she can earn more votes from the moderate voters. In this simulation, when the number of moderate voters exceeds 82%, the Mod-Ind candidate has the motivation to allow the Ext-Ind candidate running in the election strategically. When almost all voters are moderate, the Mod-Ind candidate can gain 56% of votes after **Ext-Ind** candidate emerged.

[Figure 3]

This simulation of the mainstream party's calculation helps us to explain strategic choices of the mainstream party in real elections. According to the long-term survey conducted by the Election Study Center at National Chengchi University in Taiwan,^{xii} in 2015 there are only 4.3% of Taiwanese people seeking immediate independence and 1.5% supporting immediate unification. In contrast, 85.4% of Taiwanese wants to maintain status quo, at least in the short run.^{xiii} If we merely assume who prefers the status quo as being moderate voters, the distribution of Taiwanese voters on the unification-independence spectrum provides enough motivation for the major party to allow the entrance of its

extreme counterpart strategically. Therefore, our result may help rationalize DPP's strategy in the 2012 and 2016 elections, in which they cooperated with extreme pro-independence parties.

Conclusion and Discussion

Results in our survey experiments in both the United States and Taiwan suggest that range effect exists when people are interpreting political information and making voting decisions, especially in the SMD elections. Once an extreme candidate enters the electoral battleground, voters would subjectively relocate the perceived policy position of the moderate candidate on the same side of the political spectrum to a more moderate position. In the two survey experiments, the two moderate candidates have the same policy manifesto in the control and treatment groups, which rules out the alternative explanation that the moderate candidate actively moves their policy position to attract moderate voters and to prevent the emergence of the extreme parties. Moreover, we find that subject's perception of the moderate candidate on the opposite side remains unchanged, which implies that voters indeed change their perception to the intermediate option rather than change the way they scale every option. The asymmetric impact supports the two-endpoint model used in the range effect theory and is consistent with the recent studies in political science with different political settings.

The range effect has important implications for the study of political behavior. First of all, our results consolidate the psychological foundation for our argument on the mainstream party's strategy. In the last part of the previous section, we provide simulation based on experiment result to show that the major party has the motivation to strategically allow its extreme counterpart to run in the election, especially when the number of

moderate voters is large enough. The mainstream party (or the moderate major candidate) can strategically foster or repress its radical counterpart running in the election in order to change its own perceived policy position, even without changing its policy platform. It is costly for a party to shift policy positions on major issues because it may be perceived as inconsistent or even dishonest (Tavits 2007); changing policy may also be harmful to intra-party politics.^{xiv} However, by manipulating the range effect, the mainstream party can apparently make itself seem closer to the moderate median point on the ideological spectrum by doing nothing; that is, by not blocking radical candidates. In this scenario, the radical wing competitor is not a drag but becomes part of the strategy for the mainstream candidate to win the election. The case of Taiwan politics between 2012 and 2016 may serve as an example. Our result may also help explain Ezrow et al. (2014)'s finding. They analyzed the Comparative Study of Electoral Systems datasets from 1996 to 2007 and found that the moderate parties gained more when there were extreme competitors among established democracies.^{xv}

Second, the range effect and the contextual-dependent preference challenge the independence of irrelevant alternatives (IIA) assumption implicitly acknowledged in the spatial models and multinomial regression models. If the entrance of the extreme candidate changes people's perception of the existing moderate options, this phenomenon suggests that people's perception of the available options are endogenous to each other. If people do change their perceived utility as well as the choice between two options with and without the existence of the third option, the transitivity assumption may be questionable, and the Pareto optimum can hardly be defined. Similarly, the IIA assumption can be tested through a variety of statistic tools. However, if people's perceptions of the option would

be substantively changed after some other options were dropped, this shift may not be recorded in the dataset. In other words, the possibility of fulfilling IIA assumption may be overestimated.

Third, ironically, the range effect is, to some extent, beneficial to the function of democracy. The emergence of radical wing parties may indeed reflect the voice of extreme supporters, but the existence of such extreme options also indirectly makes the mainstream party more popular among the moderate voters. Therefore, the mainstream party would have more bargaining power through election results to rebalance the potential influence of the radical wing parties. Also, it may help explain why holding the primary may help the party's chance of winning the general election (Adams et al. 2008). Adams and his colleagues suggest that the primary improves the campaign skills of the candidates, while our study suggests that the competition between the extreme and moderate nominees can make the moderate one more attractive to the moderate voters, which would be vital to winning the general election.

Fourth, our study also contributes to the study of consumer psychology. Our two experiments reveal a clear tendency of range effect – the extreme counterpart will influence people's judgment on the moderate candidate. However, the effect of the extremeness aversion – that is, people will avoid the extreme option – is not very clear in the vote choices (Table 4 and 6). The reason behind this weak finding is simple: some voters are also ideologically extreme. Therefore, they need not avoid the extreme candidate. In other words, whether the extremeness aversion will appear is determined by the interplay between the characteristics of the options and the consumers.

The next step of this research project can be fivefold. First, we aim at collecting samples from representative pools of subjects so that we could examine if the same range effect also exists among the public. Second, our experimental design did not fit the (closed) primary election in the United States and only explore one possible direction that the entrance of the extreme candidate may influence voters' perception.

Third, in our survey experiment, we simplify the treatment by adding only one politically extreme party in SMD. What would happen if there were both the extreme left and extreme right-wing candidates entering into the election? Waismel-Manor and Simonovits (2017) had tested the range effect in the setting of PR with multiple candidates. We will try to build up models and arguments for such complexity. Fourth, as is suggested by Feldman and Johnston (2014), the number of dimensions in the U.S. public may be two rather than one. Even though we merely focused on the major left-right spectrum which dominates the politicians in the U.S. and the independence-unification spectrum that dominates in the Taiwan politics, it would be theoretically interesting to explore the effect of the newly emerged salient issues in or out of the existing spectrum, or the effect of a single-issue candidate's entrance. For instance, if the entrance of the new candidate only cares one issue, such as gun control or nuclear plant, would he or she still influence the moderate counterpart on the same side?

In the end, does the range effect exist in the real political world? In this article, we have provided Taiwan 2012 and 2016 presidential election as an introductory case. To further examine this possibility, we need to find out and trace the districts across elections that a radical candidate ran in past elections, while the policies announced by the major competitors remained unchanged. Surveying voters' perception of the candidates in the

two different elections may also be necessary. The search and combination of datasets require additional workload, and that is the next step of our project on studying the range effect in politics.

ⁱ This research is sponsored by the Department of Political Science at Duke University and Kenneth E. and Marie J. Corey Research Enrichment Fund at Michigan State University. We thank Herbert Kistchelt, Jake Bowers, Eric C. C. Chang, John Aldrich, Erik R. Tillman, Emerson Niou, and Kuan-chen Lee for their helpful comments. We also thank the three anonymous reviewers for their constructive suggestions throughout the review process. All errors are our own.

ⁱⁱ The concept of extreme party we focus here is different from a niche party (Meguid 2005). An extreme party does not create new issue dimensions, but it locates itself at an extreme position on the existing ideological or issue spectrum. A niche party, which creates a new issue dimension, can be ignored by dismissive strategies of the main party.

ⁱⁱⁱ Indeed, there are distinctions between proximity voting, directional voting, and discounting voting. However, Tomz and Van Houweling (2008) analyze data from 20 countries and survey experiment considering healthcare policy in the U.S., and show that proximity voting still dominates voting behavior regardless of educational level, partisanship, and ideology.

^{iv} Data is publicly available at <http://sites.duke.edu/pass/data>. Accessed: Mar. 24, 2016.

^v We appreciate two anonymous reviewers for this important question.

^{vi} <telnet://ptt.cc>

^{vii} The results of OLS estimation can be found in the supplemental material file.

^{viii} The 40-60 range was not chosen arbitrarily. First, we intuitively believed those who located themselves between 40 and 60 should be moderate, which are not far from the middle point 50. Second, the histogram of the MTurkers' self-reported ideology reveals

two peaks at 0-20 and 40-60, respectively. Third, the range includes enough number of subjects (n=105, also see footnote 10) for the regression analysis in Table 3 and contingent table analysis in Table 4. Fourth, the main result in Table 3 did not change if we applied a different definition of moderate. For example, if the range is redefined as 42-58 (n=92), the effect size of **Ext-Lib** in the model 3 in Table 3 will become 12.75 ($p < 0.05$). If 38-62 (n=144), the effect size will become 7.43 ($p < 0.1$). We really appreciate Reviewer 2 for asking for the clarification.

^{ix} Regarding the effect size and the required sample size, since the average treatment effect is about 7.3 points, and the pooled standard deviation for the moderate conservative candidates is 18.3, 99.6 subjects in each group are needed to reach the 80% power, and 133 are needed for 90% power. If we have taken into account for the 10 point effect size in the previous study (Simonovits 2017), the number of subject needed to reach 80% and 90% power should be 53.5 and 71.3, respectively. Therefore, the number of subject collected in the U.S. sample (n=100 in the treatment group) is not unsatisfied.

^x Once again, the ATE shown in Table 5 mitigates the threat of power. The two treatment effects are about 7.5 points, and the pooled standard deviation for the moderate candidates are 15.6 for DPP and 16.0 for KMT. Therefore, 68.9 and 91.2 subjects are needed to reach 80% and 90% power, both of which are smaller than the number assigned to the treatment groups (110 for Ext-Ind and 119 for Ext-Uni, respectively).

^{xi} The definition of moderates, 40-60 used in the US case, cannot be applied here. The range will leave two few sample for analysis (n=48). When the 31.5-71.5 is applied, the number of moderate voters becomes 107, which is very close to the number in the US case and fits minimum requirement for power analysis (see footnote 8) and the contingency

table analysis in Table 6. Therefore, we deliberately chose two different ranges for the two studies, partly driven by the data and their limitations.

^{xii} <http://esc.nccu.edu.tw/course/news.php?Sn=167>. Search Date: May 7, 2016.

^{xiii} 34.0% “Maintain status quo, decide at later date”; 25.4% “Maintain status quo indefinitely; 17.9% “Maintain status quo, move toward independence”; 8.1% “Maintain status quo, move toward unification”

^{xiv} It is possible that partisan voters may update their own policy position to follow their long-attached party. However, based on the study of the European politics, Adam et al. (2008) found that people did not systematically follow the policy change of their attached party, nor did they adjust their loyalty. Instead, they only systematically update their subjective perceptions among the parties.

^{xv} However, the opposite effect is found among new democracies because mainstream parties have not occupied a certain policy position on the spectrum.

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Table 1: Socio-Demographics of MTurk Subjects

Variable	N	Mean	St. Dev.	Min	Max
Age	509	37.51	11.18	18	74
Male	509	0.54	0.50	0	1
Yearly Income (1=20K, 6=250K (in USD))	508	2.42	0.93	1	5
Edu (1=High school, 7=PhD)	509	4.22	1.22	1	7
Black	509	0.08	0.27	0	1
Importance of Religion Life	505	1.99	1.35	1	5
Self-Reported Liberal-Conservative Position (0-100)	508	38.45	28.19	0	100

Table 2: Socio-Demographics of PTT Subjects

Variable	N	Mean	St. Dev.	Min	Max
Age	426	23.57	4.92	18	54
Female	427	0.46	0.50	0	1
Monthly Income (1=20K, 5=150K (in NTD))	426	2.42	1.04	1	5
Edu (1=High school, 7=PhD)	426	3.24	0.48	2	4
Self-Reported Uni-Ind Position (0-100)	427	78.61	20.54	0	100

Table 3: Tobit Models on Candidates' Perceived Liberal-Conservative Position

	<i>Dependent Variable:</i>					
	View on Mod-Lib			View on Mod-Con		
	Full	Full	Moderate	Full	Full	Moderate
Ext-Con running	-1.875 (2.235)	-2.773 (2.214)	4.040 (5.717)	-7.181*** (2.314)	-7.274*** (2.331)	-19.031*** (4.891)
Ext-Lib running	0.665 (2.226)	0.742 (2.196)	9.979* (5.892)	1.247 (2.315)	1.137 (2.327)	-6.318 (5.052)
Demographics × Treatments		YES	YES		YES	YES
Constant	24.202*** (1.806)	24.443*** (1.796)	23.519*** (4.699)	78.866*** (1.879)	79.131*** (1.905)	80.645*** (4.029)
Observations	484	481	96	488	485	97
Log Likelihood	-2025	-1993	-409.4	-2055	-2029	-395.4
Ward Test	1.968 (df=2)	30.19 (df=20)	16.99 (df=20)	21.43 (df=2)	34.91 (df=20)	39.12 (df=20)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 4: Vote Choice among Treatment Groups and Voter's self-placement

Voter Type	Liberal (<40)	Moderate(40-60)	Conservative(>60)	All
Vote Choice	Lib, Con, Ext	Lib, Con, Ext	Lib, Con, Ext	Lib, Con, Ext
Control	100%, 0%	73%, 27%	12%, 88%	71%, 29%
Group A: Ext-Con	96%, 0%, 4%	68%, 30%, 3%	10%, 73%, 17%	69%, 27%, 5%
Group B: Ext-Lib	37%, 2%, 62%	29%, 31%, 40%	4%, 83%, 13%	27%, 27%, 46%

Table 5: Tobit Models on Candidates' Perceived Unification-Independence Position

Variable	<i>Dependent Variable:</i>			
	View on Mod-Ind		View on Mod-Uni	
	(1)	(2)	(3)	(4)
Ext-Ind running	-7.440** (2.082)	-7.575** (1.996)	2.452 (2.072)	2.802 (1.984)
Ext-Uni running	-0.462 (2.044)	-1.170 (1.971)	7.914** (2.025)	9.284** (1.949)
Demographics × Treatments		YES		YES
Constant	72.455** (1.387)	72.626** (1.353)	30.288** (1.369)	29.759** (1.324)
Observations	368	366	372	370
Log Likelihood	-1480	-1488	-1524	-1495
Ward Test	15.191** (df=2)	67.186** (df=17)	15.660** (df=2)	62.321** (df=17)

Note: *p<0.05; **p<0.01

Table 6: Vote Choice among Treatment Groups and Voter's self-placement

Voter Type	Pro-Uni Uni, Ind, Ext	Moderate Uni, Ind, Ext	Pro-Ind Uni, Ind, Ext	All Uni, Ind, Ext
Control	100%, 0%	42%, 58%	9%, 91%	23%, 77%
Group A: Ext-Ind	100%, 0%, 0%	27%, 64%, 9%	6%, 46%, 48%	12%, 50%, 38%
Group B: Ext-Uni	33%, 33%, 33%	42%, 55%, 3%	14%, 84%, 2%	20%, 77 %, 3%

Median and Density Plots of Perceived Candidate Positions across Experimental Groups (MTurk, n=498)

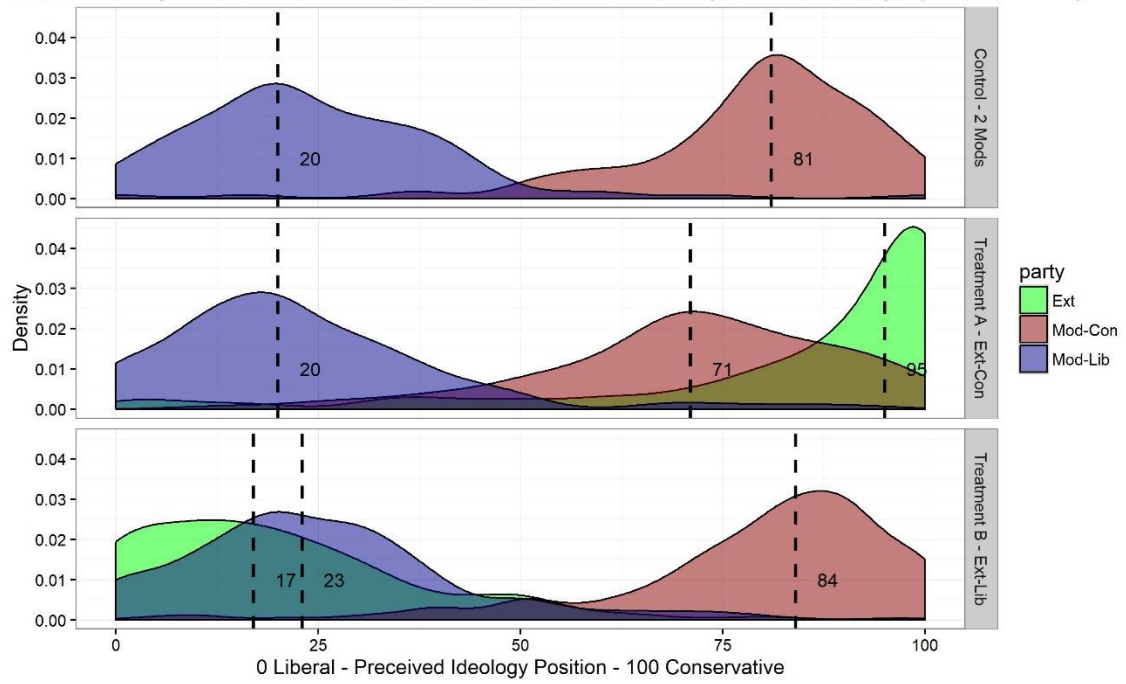


Figure 1. Median and Density Plots of Perceived Candidate Positions, Study 1

Median and Density Plots of Perceived Candidate Positions across Experimental Groups (n=427)

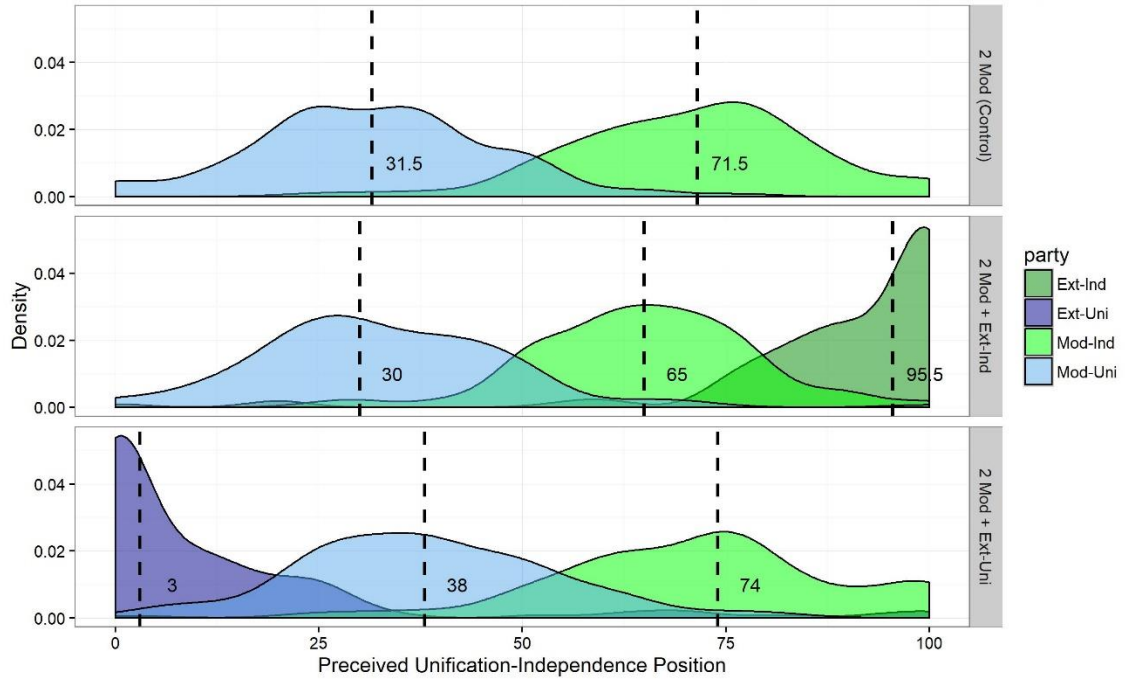


Figure 2. Median and Density Plots of Perceived Candidate Positions, Study 2

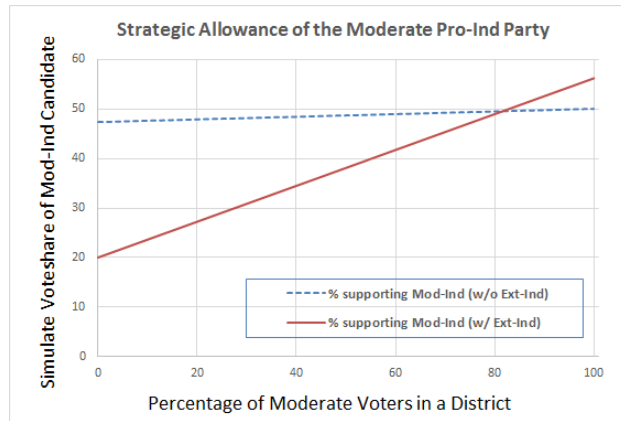


Figure 3. Number of Moderate voters motivates Major party's strategy