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Specification Issues in Assessing the Moderating Role of Issue Importance: A Comment on Grynaviski and Corrigan (2006)

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The empirical study of spatial issue voting has experienced a resurgence in recent years due to advances in data collection and research design. Grynaviski and Corrigan make several important contributions to this literature. In this note, we comment on one of Grynaviski and Corrigan's recommendations—to not include a main effect for issue importance when estimating models assessing the interactive relationship between importance and policy proximity. According to the authors, including the main importance term is incorrect because it is not necessary in representing a scale-invariant functional form under some assumptions and is insufficient under others. In deriving their reduced-form expression, the authors produce a model that is unintuitive and inappropriate for most data. Moreover, the restrictions Grynaviski and Corrigan impose on their model can produce perverse empirical predictions. We show that a model including main effect terms for importance is indeed scale invariant and that inclusion of the main importance term is necessary for scale invariance with respect to partial utility functions.

1 Introduction

Many models of voting behavior posit that citizens compare the issue positions of candidates to their own positions when casting votes in elections. Ceteris paribus, the voter should maximize utility by voting for the candidate whose policy positions are closest to his or her own policy positions, though closeness can be defined in various different ways (e.g., Rabinowitz and Macdonald 1989; Merrill 1995; Merrill and Grofman 1999; MacDonald, Rabinowitz, and Listhaug 2001; Westholm 2001). The empirical study of spatial issue voting has experienced a resurgence in recent years due to advances in data collection and research design. For example, recent research has attempted to deal with the problem of projection experimentally (e.g., Tomz and Van Houweling 2008) and by placing voters and candidates on a common scale (e.g., Jessee 2009). Hence, understanding how to properly specify these models in their reduced-form is critically important.

Grynaviski and Corrigan (2006) contribute to the policy voting literature by comparing two different measures of distance (Euclidean versus city-block), comparing two different ways to specify the candidate position (individual perceptions versus average sample perceptions) and by investigating the moderating impact of issue importance on the relation between issue proximity and candidate preference. In doing so, Grynaviski and Corrigan (2006) make many meaningful contributions to the study of issue voting.

With respect to the third point above, Grynaviski and Corrigan (2006) argue that to assess whether voters place more weight on issues that are personally important to them, researchers should estimate a model predicting a dependent variable (e.g., vote choice or candidate favorability) with issue distance and the interaction between issue distance and issue importance. Notably, Grynaviski and Corrigan (2006) reject the advice of almost all other researchers (e.g., Griepentrog, Ryan, and Smith 1982; Aiken and West 1991; Brambor, Clark, and Golder 2006) and recommend that the term representing the main effect of importance be excluded from the model specification. Grynaviski and Corrigan (2006) justify omission of

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the main effect of importance in their analyses on the basis that their model is scale invariant with respect to the importance measure and the policy space.[1] Conversely, the authors contend that including the main effect of importance does not produce a scale-invariant model.

In this comment, we demonstrate that a model including the main effect of importance is scale invariant. Additionally, using a more proper set of assumptions, we show that including this term is necessary to achieve scale invariance with respect to the partial utility functions as defined below. Moreover, excluding the main effect makes the problematic assumption that the excluded effect is zero and consequently that candidate evaluations are identical among the highest- and lowest importance people whose policy positions match the candidate. Below, we show via an empirical example that this can lead to perverse predictions about the relationship between issue distance and favorability.

This paper is organized as follows. The first section reviews Grynaviski and Corrigan's (2006) model and points out some problems in its presentation. The following section presents our alternative partial utility model, which includes a main effect for importance. The third section presents formal proofs that demonstrate that the more flexible partial utility model is scale invariant. The fourth section intuitively explains our results with both a hypothetical illustration and an empirical example from the 1996 American National Election Study. The final section concludes with our recommendations to researchers.

2 Grynaviski and Corrigan's Model

Grynaviski and Corrigan (2006) define the spatial utility model for voter i by

$$U_{ij} = -\left|\left|\mathbf{v}_i - \mathbf{c}_{ij}\right|\right|_{\boldsymbol{\beta}\circ\mathbf{w}_i} + \alpha, \tag{1}$$

where "$\left|\left| \cdot \right|\right|_{\boldsymbol{\beta}\circ\mathbf{w}_i}$ denotes an arbitrary distance function (usually the city-block or squared Euclidean metrics) in which each component is scaled by an element of $\boldsymbol{\beta} \circ \mathbf{w}_i$, α represents the average voter's utility for candidate j, $\boldsymbol{\beta}$ is the importance of an issue dimension for the average voter, $\mathbf{w}_i$ is a vector of weights that i places on each dimension of the policy space, and $\boldsymbol{\beta} \circ \mathbf{w}_i$ denotes the vector formed from the element-wise products" (394).[2] As examples, Grynaviski and Corrigan (2006) define the city-block model as

$$U_{ij} = -\sum_{k=1}^{K} \beta_k w_{ik}\left|v_{ik} - c_{ijk}\right| + \alpha \tag{2}$$

and the squared Euclidean model as

$$U_{ij} = -\sum_{k=1}^{K} \beta_k w_{ik}\left(v_{ik} - c_{ijk}\right)^2 + \alpha, \tag{3}$$

where k indexes the issue and K denotes the number of issues.

Unfortunately, the definition of the spatial model given by equation (1) is problematic. The definition of $\left|\left| \cdot \right|\right|_{\boldsymbol{\beta}\circ\mathbf{w}_i}$ is ill-defined if the terms are used according to their standard mathematical definitions.[3]

In addition to this problem, their description of the parameter α is misleading. The parameter α cannot represent the average voter's utility for candidate j unless $\left|\left|\mathbf{v}_i - \mathbf{c}_{ij}\right|\right|_{\boldsymbol{\beta}\circ\mathbf{w}_i} = 0$ for the average voter. At least under their examples, $\left|\left|\mathbf{v}_i - \mathbf{c}_{ij}\right|\right|_{\boldsymbol{\beta}\circ\mathbf{w}_i} = 0$ only when $\boldsymbol{\beta} \circ (\mathbf{v}_i - \mathbf{c}_{ij}) = 0$. If all elements of $\boldsymbol{\beta}$ are positive, this implies that $\mathbf{v}_i = \mathbf{c}_{ij}$. In this case, α can only represent the average voter's utility for candidate j if candidate

[1]Grynaviski and Corrigan (2006) used the term "scale invariance" to refer both additive and multiplicative transformations. An alternative approach sometimes encountered would be to define "scale invariance" as meaning only that results are unaffected by a multiplicative transformation and to define "location invariance" to mean that results are unaffected by an additive transformation. The term "location-scale invariance" would then be used to mean what Grynaviski and Corrigan (2006) refer to as "scale invariance." In this paper, we retain the terminology used by Grynaviski and Corrigan (2006).

[2]We will continue to use $x \circ y$ to represent the element wise (or Hadamard) product of x and y.

[3]Specifically, the standard definitions of *distance function* and *metric* (which are usually synonymous) do not fit because distance functions are normally a function of two values and the square of Euclidean distance does not meet the usual definition. The $||\cdot||$ notation and a heading that reads "Distance Metric (Norm)" would seem to suggest a norm or seminorm, but the square of Euclidean distance also violates the standard definition of these terms. Moreover, the definition of "scaled by an element of $\boldsymbol{\beta} \circ \mathbf{w}_i$" is unclear if distance function is used in any of these manners. Given a definition of $||\cdot||$, $\left|\left|x\right|\right|_{\boldsymbol{\beta}\circ\mathbf{w}_i} = \left|\left|\boldsymbol{\beta} \circ \mathbf{w}_i \circ x\right|\right|$ would seem reasonable but is inconsistent with respect to their usage of squared Euclidean distance.

j is at the average voter's ideal point. Moreover, if "average voter's utility" were to mean the average utility of all voters (rather than the utility of a single voter who is in some sense average), then this description would only be accurate if all voters shared the same ideal point as the candidate.

Regardless of the intended meaning of $||\cdot||_{\boldsymbol{\beta}\circ\mathbf{w}_i}$, it is clear that their definition of the spatial utility model is not the most general one possible. The original definition of Downs (1957) of the spatial utility model simply stated that utility functions were single peaked. Although the analysis of Downs (1957) was limited to a single dimension, the definition is more general in other respects. Empirical applications generally need to limit themselves to a much narrower set of models.[4] These models often do take a form consistent with equations (2) or (3). However, such models are being applied to cases where utility can only be inferred from a voter's choice between two alternatives. Under such conditions, the utility functions are only identified up to a monotonic transformation[5] or at least an additive function. As a result, α is unidentified and usually assumed to be zero. However, this is not meant to foreclose a component to the utility function that varies by voter but does not depend on the candidate. Rather, such a term is not included because the researcher is only concerned with the difference between the utility of a single voter from two competing choices in which case the term would cancel out. Grynaviski and Corrigan (2006), however, are interested in using a spatial utility function and, thus, make a strong assumption in assuming that all voters share the same utility from a candidate at their ideal point.

The potential problems with this assumption are highlighted by Grynaviski and Corrigan's (2006) description of α. Although their description suggests that the average voter would share the same utility for all candidates or perhaps that the average utility of all voters is the same regardless of the candidate, this cannot, in general, be true. Rather, α represents the utility of any given voter from a candidate at his ideal point. By imposing this form on the spatial utility model, Grynaviski and Corrigan (2006) assume that caring more about an issue can never make a candidate more appealing to a voter—even one at his ideal point.[6]

Although the spatial utility model may not be completely accurate, we believe that it often creates a reasonable approximation to voter behavior. However, Grynaviski and Corrigan (2006) place restrictions on the model, which are not part of the spatial model as it is generally understood and which we will argue create significant counterintuitive implications that are unnecessary. Below, we specify an otherwise similar model without such restrictions.

3 Partial Utility Model

3.1 *The Model*

Since Grynaviski and Corrigan's (2006) definition of the spatial utility function is ill-defined and includes an unjustified assumption, we build up a model for the same situation with a more explicit justification. Although we find this justification useful, the counterintuitive implications that exist for the models suggested by Grynaviski and Corrigan (2006) do not exist for these models (as discussed in the following section) and provide a compelling reason to favor these models over those proposed by Grynaviski and Corrigan (2006) regardless of how one arrives at them.

We define the utility of voter i for candidate j, U_{ij}, in terms of partial utility functions that each define a component of the utility function (or "partial utility") for a single issue and an aggregator function that combines these partial utilities with the weight a voter attaches to each issue to form the voter's total utility. Each partial utility function is assumed to take the same form and depends only on the difference between the position of the voter and the position of the candidate on the issue in question and the aggregator function weights each partial utility function according to the importance given to the issue by the voter.

Following the notation in Grynaviski and Corrigan (2006), v_{ik} will denote the position of voter i on issue k, c_{ijk} will denote the position of the candidate j on issue k as evaluated by voter i, and w_{ik} will denote the weight attached to issue k by voter i. Additionally, P_{ijk} will represent the partial utility of voter i from

[4]Kalandrakis (2010) demonstrates that any finite number of binary votes is perfectly consistent with any possible ideal point ordering under Downs's assumptions. Thus, ideal point estimation is impossible without further assumptions.

[5]As is standard in the economics literature (e.g., Carter 2001), we use the term "monotonic transformation" here to mean a transformation by a strictly increasing function, not a monotonic function.

[6]Note that this would not matter if we were only concerned with whether a voter preferred one candidate to another because disliking candidates that were not at the voter's ideal point more would be equivalent to liking a candidate at the voter's ideal point more—both would lead the voter to be more likely to vote for a candidate at his ideal point and the distinction has no impact.

candidate j on issue k and U_{ij} will represent the total utility of voter i from candidate j. The partial utility for issue k takes the form

$$P_{ijk} = f_k\left(|v_{ik} - c_{ijk}|\right) \tag{4}$$

with f_k a strictly decreasing function and P_{ijk} representing the partial utility for issue k. The total utility function then takes the form

$$U_{ij} = \sum_{k=1}^{K} w_{ik} P_{ijk}. \tag{5}$$

Aside from concerns over scale invariance (discussed in the next subsection), the city-block model and squared Euclidean model discussed by Grynaviski and Corrigan (2006) are the cases where $f_k(x) = -|x|$ and $f_k(x) = -x^2$, respectively, for all issues k.[7]

3.2 *Scale Invariance*

Grynaviski and Corrigan (2006) discuss the need to allow for arbitrary choices of scale for weights, which affect $\mathbf{w}_i$, and the policy space, which affects v_{ik} and c_{ijk}, by at least allowing for an arbitrary positive affine transformation (i.e., a transformation that allows for the addition of a constant and multiplication by a positive constant). We agree. However, Grynaviski and Corrigan (2006) only apply scale invariance to the weights and the policy space. We believe that it is also important to allow for an arbitrary choice of scale for the partial utility functions. This is sufficient for the total utility function in equation (5) to be scale invariant. The scale-invariant forms for the city-block model and squared Euclidean model would be $f_k(x) = d_k - e_k|x|$ and $f_k(x) = d_k - e_k x^2$, respectively, for arbitrary constants d_k and e_k with $e_k > 0$ for all issues k.

As with the representation of the weights and policy space, we have no way of knowing the scales of the partial utility functions. These scales matter. Indeed, it is clear in this representation that parameter vector $\boldsymbol{\beta}$ in Grynaviski and Corrigan's (2006) representation, which is equivalent to a vector with elements e_k in our representation, serves precisely the purpose of providing scale invariance of the partial utility functions to multiplicative transformations. The scalar term α allows for an additive transformation of the total utility function but, unlike $\boldsymbol{\beta}$, does not allow for additive transformations of the partial utility functions.

It is useful, however, to allow for additive transformations of the partial utility functions. Without allowing for this, we assume that all voters attach a partial utility of zero to all candidates at their ideal point on the issue in question—meaning that all voters treat such a candidate identically regardless of the importance they attach to the issue. A partial utility of zero, however, means that the candidate's position on this issue is, in some sense, neutral from the point of view of the voter. One could view this as meaning that the voter views the candidate as neither good nor bad on this issue and, therefore, his utility from this candidate does not vary with the weight he attaches to this issue. In comparison, a positive partial utility would mean that a voter derives greater utility from the candidate if he attaches more importance to the issue—a possibility implicitly ruled out by Grynaviski and Corrigan (2006), but one which we find believable and useful. By allowing additive as well as multiplicative transformations of the partial utility functions, we are allowing for positive partial utility on a given issue for candidates whose positions are within some unknown distance of the voter's position and negative partial utility for candidates beyond this distance.

The argument for allowing scale invariance to the partial utility function is built around the partial utility function representation. However, this is not the only possible justification for the inclusion of main effect terms for the weights. More generally, different types of voters attach different weights to different issues. There is no reason to expect that voters with different issue importance weights but identical ideal points would attach the same utility to a candidate at their ideal point—particularly when comparing a voter who attaches a great deal of importance to all issues with one who attaches no importance to all issues. Thus, the term α in Grynaviski and Corrigan's (2006) representation of the spatial utility

[7]Note that equations (4) and (5) are neither the most general nor the most elegant representation of the spatial utility model but are nonetheless relatively intuitive and seem to capture roughly the set of models suggested by Grynaviski and Corrigan (2006), including the two special cases on which they focus.

model should be allowed to vary from voter to voter and allowed to depend on the weights, $\mathbf{w}_i$, with a linear model being the most practical representation.[8] Although this produces the same results as the partial utility justification presented above, we believe that the partial utility representation provides a more natural representation and a clearer justification. Regardless of the justification, the failure to include main effect terms has unintended and counterintuitive implications, as we will demonstrate in Section 4.

4 Formal Proofs

To demonstrate that a model including main effect terms is scale invariant with respect to issue importance, the policy space, and the partial utility functions, we present two theorems along the lines of those presented by Grynaviski and Corrigan (2006).

Proposition 1. For city-block distance with perceived candidate placement, a scale-invariant form is $U_{ij} = \phi + \sum_{k=1}^{K} \gamma_k w'_{ik}\left|v'_{ik} - c'_{ijk}\right| + \zeta_k\left|v'_{ik} - c'_{ijk}\right| + \eta_k w'_{ik}$, where ϕ, γ_k, ζ_k, and η_k are all parameters that depend on the scales.

Proof: For city-block distance, equations (4) and (5) with $f_k(x) = d_k - e_k|x|$, $w = a_w + b_w w'_{ik}$, $v_{ik} = a_v + b_v v'_{ik}$, and $c_{ijk} = a_c + b_c c'_{ijk}$ gives

$$U_{ij} = \sum_{k=1}^{K} \left(a_w + b_w w'_{ik}\right)\left(d_k - e_k\left|\left(a_v + b_v v'_{ik}\right) - \left(a_c + b_c c'_{ijk}\right)\right|\right).$$

By assumption, $a_c = a_v$ and $b_c = b_v$. Then,

$$U_{ij} = \sum_{k=1}^{K} \left(a_w d_k - b_w e_k w'_{ik}\left|v'_{ik} - c'_{ijk}\right| - a_w e_k\left|v'_{ik} - c'_{ijk}\right| + b_w d_k w'_{ik}\right),$$

satisfying

$$U_{ij} = \phi + \sum_{k=1}^{K} \gamma_k w'_{ik}\left|v'_{ik} - c'_{ijk}\right| + \zeta_k\left|v'_{ik} - c'_{ijk}\right| + \eta_k w'_{ik}$$

with $\phi = \sum a_w d_k$, $\gamma_k = -b_w e_k$, $\zeta_k = -a_w e_k$, and $\eta_k = b_w d_k$. □

Proposition 2. For squared Euclidean distance with perceived candidate placement, a scale-invariant form is $U_{ij} = \phi + \sum_{k=1}^{K} \gamma_k w'_{ik}(v'_{ik} - c'_{ijk})^2 + \zeta_k\left(v'_{ik} - c'_{ijk}\right)^2 + \eta_k w'_{ik}$, where ϕ, γ_k, ζ_k, and η_k are all parameters that depend on the scales.

Proof: For squared Euclidean distance, equations (4) and (5) with $f_k(x) = d_k - e_k x^2$, $w = a_w + b_w w'_{ik}$, $v_{ik} = a_v + b_v v'_{ik}$, and $c_{ijk} = a_c + b_c c'_{ijk}$ gives

$$U_{ij} = \sum_{k=1}^{K} \left(a_w + b_w w'_{ik}\right)\left(d_k - e_k\left(\left(a_v + b_v v'_{ik}\right) - \left(a_c + b_c c'_{ijk}\right)\right)^2\right).$$

By assumption, $a_c = a_v$ and $b_c = b_v$. Then,

[8] As discussed above, this is in no way at odds with common representations of a spatial utility model, as researchers who omit an individual-specific term like α_i—or even a constant term like α—do so because they use the model in such a way that this term would be unidentified. This typically occurs because the utility functions are only used to define which choice a voter makes, which is not the case here. In determining which choice is made, the main effect terms for issue importance would not affect the predictions of the model and would therefore be unidentified.

$$U_{ij} = \sum_{k=1}^{K} \left(a_w d_k - b_w e_k w'_{ik} \left(v'_{ik} - c'_{ijk} \right)^2 - a_w e_k \left(v'_{ik} - c'_{ijk} \right)^2 + b_w d_k w'_{ik} \right),$$

satisfying

$$U_{ij} = \phi + \sum_{k=1}^{K} \gamma_k w'_{ik} \left(v'_{ik} - c'_{ijk} \right)^2 + \zeta_k \left(v'_{ik} - c'_{ijk} \right)^2 + \eta_k w'_{ik}$$

with $\phi = \sum a_w d_k$, $\gamma_k = b_w e_k$, $\zeta_k = a_w e_k$, and $\eta_k = b_w d_k$. □

5 Implications

5.1 *Hypothetical Illustration*

To illustrate the problem with regard to importance judgments, consider the intuitive example of two voters, A and B, who are rating Candidates C and D (see Fig. 1). Voters A and B have identical policy preferences on all issues: they are extremely liberal on all issues, including environmental protection. Voters A and B are also identical to one another in terms of the amount of importance they attach to all issues (all are moderately important to them) except environmental protection. Voter A considers environmental protection to be extremely personally important, whereas Voter B considers environmental protection not to be important at all ($w_A > w_B$).

Candidate C takes extremely conservative positions on all issues except environmental protection on which he takes a liberal stand. This means that Voters A and B disagree entirely with his positions on all issues other than environmental protection but agree almost (but not quite) completely with his position on environmental protection. Candidate D takes the same extremely liberal position as A and B on all issues except environmental protection on which he takes an extremely conservative position. Hence, Voters A and B agree with him on all issues except environmental protection on which they vastly disagree.

Intuitively, Voter A should gain more utility from Candidate C than does Voter B because Voter A's agreement with Candidate C is worth more to Voter A (who considers environmental protection to be important) than the same level of agreement with Candidate C is to Voter B (who considers environmental protection to be unimportant). Likewise, Voter A should gain less utility from candidate D than does Voter B because Voter A's disagreement with Candidate D is more important to Voter A than the same level of disagreement is to Voter B.

However, this is not what the Grynaviski and Corrigan (2006) analytic approach posits. According to their model (see equation (1)), as the distance between the voters' issue positions and the candidate's issue positions decreases, the utility of the candidate to the voter becomes less negative and therefore increases. And the more importance is attached to an issue by the voter, the more the distance on that issue influences overall utility. Although this approach seems quite reasonable at first glance, it is problematic when considered in light of our example involving Voters A and B, Candidates C and D, and the issue of environmental protection. According to this analytic approach, the small distance between the voters and the candidates on environmental protection is multiplied by an unknown coefficient and a large weight for Voter A and by a smaller weight for Voter B. Thus, if the coefficient is negative, this approach posits

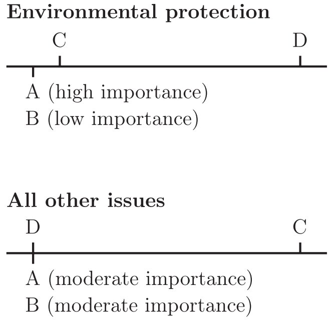

Fig. 1 Hypothetical illustration.

that Voter B should gain slightly more utility from Candidate C than does Voter A, whereas the equally close proximity of the candidate to both voters on environmental protection should be more valuable to Voter A than to Voter B. If the coefficient is positive, this approach posits that Voter A should gain slightly more utility from Candidate D than does Voter B, whereas the large distance between voter and the candidate on environmental protection should matter more to Voter A than to Voter B. Either one dislikes a candidate more when attaching more importance to an issue on which one agrees with the candidate or one likes a candidate more when attaching more importance to an issue on which one disagrees with the candidate. Both possibilities seem counterintuitive.

Under our approach, Voter A will gain more utility from Candidate C than does Voter B so long as Candidate C's position is not too far from the position of Voters A and B on environmental protection. Likewise, Voter A will gain less utility from Candidate D than does Voter B so long as Candidate D's position is sufficiently far from the positions of Voters A and B on environmental protection. Hence, the utility function incorporates the substantively sensible consideration that voters derive utility from candidates that are close to them and lose utility from candidates that are far from them on issues that are important to them, which is lacking in Grynaviski and Corrigan's (2006) approach.

Another problem with the Grynaviski and Corrigan (2006) approach is that if Voters A and B agree completely with Candidate C on environmental protection, Voter A would be posited to gain no more utility from Candidate C than did Voter B. But it seems much more plausible that this perfect agreement would be worth more to Voter A, who attaches more importance to the issue.

In our model, these counterintuitive results disappear. The slight disagreement that Voters A and B have with Candidate C on environmental protection can still translate into positive utility on the issue, and, thus, the greater weight placed on the issue by Voter A would lead to this amount being multiplied to give Voter A greater overall utility from Candidate C. However, if we also require scale invariance of the partial utility functions, the results presented in Grynaviski and Corrigan (2006) no longer hold true, and our approach appears correct under two of the cases presented by Grynaviski and Corrigan.

5.2 *Empirical Example*

To illustrate our main argument, we use an example from the 1996 American National Election Study. Our objective here is not to explain voting behavior in the 1996 presidential election but rather to provide an empirical instance of where the Grynaviski and Corrigan (2006) model can lead to faulty inferences. Respondents were asked to evaluate President Bill Clinton on a 101-point feeling thermometer. They were also asked to report (1) their own position on environmental protection on a 7-point scale, (2) what they perceived Clinton's position to be on the same 7-point scale, and (3) how important the issue of environmental protection was to them personally on a 5-point scale.[9]

In Fig. 2, we plot the estimated relationships for both the Grynaviski and Corrigan (2006) model and our approach for the city-block distance measure. As shown on the left-hand side, the moderating effect of importance on spatial issue voting is not sensible under Grynaviski and Corrigan's (2006) framework. The Grynaviski and Corrigan (2006) model constrains the evaluation of Clinton to be identical for both highest- and lowest importance respondents when their position of the issue is identical to their perception of Clinton's position. Such an assumption clearly seems overly restrictive. For the highest importance respondents, perceived distance from Clinton has a statistically significantly smaller effect than for lower-importance respondents ($p < 0.001$). We obtain such a perverse result because the data suggest that many respondents consider themselves close enough to Clinton's position on environmental protection that they view him more favorably if they attach more importance to the issue. In the absence of a main effect term for importance, the model can only fit such a relationship by reducing the effect for the highest importance people.[10] Conversely, with our model, the moderating effect of issue importance is much more sensible

[9]Exact question wordings were (1) "Some people think it is important to protect the environment even if it costs some jobs or otherwise reduces our standard of living. Suppose these people are at one end of the scale, at point number 1. Other people think that protecting the environment is not as important as maintaining jobs and our standard of living. Suppose these people are at the other end of the scale, at point number 7. And, of course, some other people have opinions somewhere in between, at points 2, 3, 4, 5 or 6. Where would you place yourself on this scale, or haven't you thought much about this?" (2) "Where would you place Bill Clinton on this scale?" and (3) "How important is this issue to you?"

[10]In Grynaviski and Corrigan's (2006) empirical analyses using the same data set, they do not observe this relationship. This is because they also include a host of control variables that may proxy for the main effect of importance.

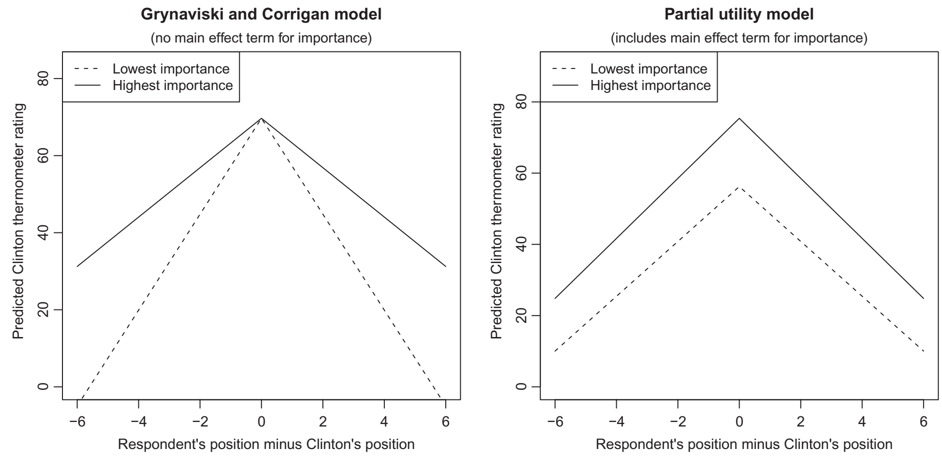

Fig. 2 Predictions using city-block distance. Estimated relationships for environmental protection issue from 1996 American National Election Study.

(see right-hand side). Including a main effect for importance allows the model to predict that respondents who agree with Clinton and for whom environmental issues are important view Clinton more favorably than respondents who agree with Clinton but for whom the environment is not important. We find that the highest-importance respondents are slightly more sensitive to issue distance in their evaluations of Clinton than the lowest-importance respondents. We obtain similar findings for squared Euclidian distance (Fig. 3), although the decreased effect for high-importance respondents is no longer statistically significant when using Gryanviski and Corrigan's (2006) framework.

6 Conclusions

Grynaviski and Corrigan (2006) have made a significant contribution to the study of issue voting by setting forward a set of guidelines on how to measure both candidate placements and issue distances that should serve empirical researchers well. This comment has made one revision to their original article in which we show that the traditional approach of including all constituent terms in testing the moderating effect of issue importance is preferred to the alternative approach of excluding the main effect of importance. The

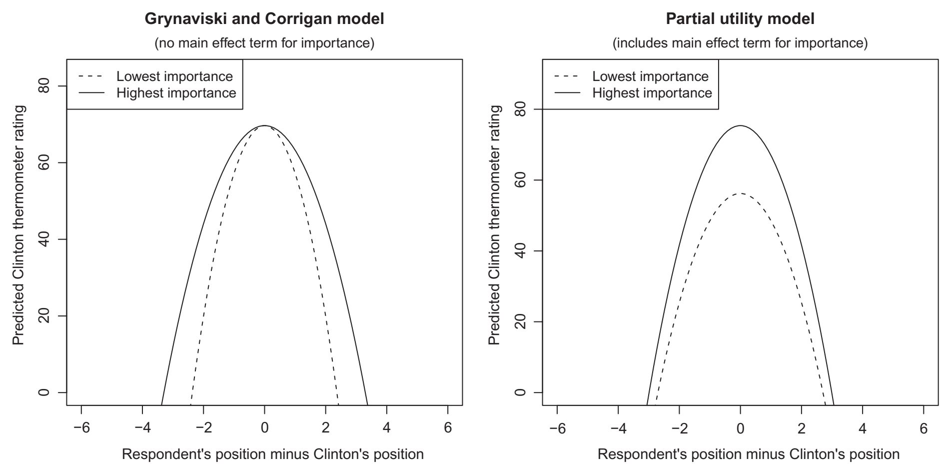

Fig. 3 Predictions using squared Euclidean distance. Estimated relationships for environmental protection issue from 1996 American National Election Study.

results show that, with the assumptions outlined, both the models for squared Euclidean distance and city-block distance are scale invariant. Models including both main effects, as is recommended throughout the literature, are therefore not misspecified if workings of proximity models are carefully considered, as our brief example has shown. On the other hand, models excluding one main effect are scale invariant but invoke the problematic assumption that the excluded effect is zero, which, as described above, may be substantively and empirically insensible. Hence, we recommend that researchers studying issue proximity and analyzing the moderating role of issue importance (or any other moderating variable for that matter) should not exclude the main effect in their regression models.

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