

Metaphorical Accounting: How Framing the Federal Budget Like a Household's Affects Voting Intentions

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Abstract

Political discourse is saturated with metaphor, but evidence for the persuasive power of this language has been hard to come by. We addressed this issue by investigating whether voting intentions were affected by implicit mappings suggested by a metaphorically framed message, drawing on a real-world example of political rhetoric about the federal budget. In the first experiment, the federal budget was framed as *similar to* or *different from* a household budget, though the information participants received was identical in both conditions. When the federal budget was described as *similar to* a household's, people considered the personal finances of a presidential candidate more relevant—a finding we replicated in a larger, pre-registered study. In a follow-up experiment, we presented participants with a more explicit rhetorical argument and found a similar effect, moderated by political affiliation. These studies illuminate how metaphorical comparison affects cognition for important real-world issues, sometimes in unintended ways.

Keywords: Framing; Metaphor; Political psychology; Reasoning; Voting

1. Introduction

Economic issues frequently dominate presidential election cycles. Gallup polling reveals that more than 80% of people considered the economy an important election issue in the six most recent U.S. presidential elections (Jones, 2012, 2015). Indeed, Democrats and Republicans, as well as Independents, routinely list the economy as the *most* important factor in determining their vote, although the specific points of emphasis differ by political ideology: Left-leaning political actors tend to highlight income inequality, whereas right-leaning political actors tend to focus on the federal budget deficit (Bartels, 2009).

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1 As in many areas of political discourse, politicians and pundits have developed specific
2 metaphors in an attempt to influence voter attitudes toward economic issues
3 (Charteris-Black, 2005; Lakoff, 2004, 2008). In recent years, for example, several Repub-
4 licans have grounded claims about the importance of reducing the budget deficit in a
5 metaphorical comparison to household finances. For instance, in 2012, the Romney
6 campaign repeated a slogan “Your family has to operate on a budget, so why doesn’t the
7 federal government have to do the same?” (Team Romney, 2012). The persuasive appeal
8 of this message relies on the inference voters are asked to draw from the metaphorical
9 mapping: namely, that the economic status of the country will decline if the budget defi-
10 cit is not addressed, much as the economic security of a family in debt is in jeopardy.
11 This captures one of the key conceptual functions of metaphor: By describing something
12 novel, complex, or abstract (e.g., the federal budget) in terms of something more familiar
13 and concrete (e.g., a personal budget), metaphors allow us to use our existing schematic
14 knowledge structures to think more efficiently and productively (Bohan & Keane, 2004;
15 French, 2002; Hanne, 2015; Lakoff, 2004, 2008; Sopory & Dillard, 2002; Thibodeau &
16 Boroditsky, 2011).

17 Though speakers often choose a metaphor or analogy deliberately in order to influence
18 listener attitudes in a specific way (Steen, 2011), many comparisons accommodate multi-
19 ple structural mappings between source and target domains that go beyond the speaker’s
20 intentions, which may themselves be candidates for further inferences (Blanchette &
21 Dunbar, 2002; Gentner & Markman, 1997; Lakoff, 2008). In other words, there may be
22 unintended consequences when an issue is framed using certain metaphors. This possibil-
23 ity was recently demonstrated in a study that showed that the OBESITY IS A DISEASE
24 campaign launched by the American Medical Association, which was intended to reduce
25 the stigma associated with the condition, also leads overweight individuals to make
26 unhealthy food choices (i.e., because of the reduction in personal responsibility associated
27 with the disease frame; Hoyt, Burnette, & Auster-Gussman, 2014).

28 In the present case, equating the federal budget with a household’s is intended to
29 suggest that the government must rein in spending, and thus the listener should vote
30 for the candidate whose platform prioritizes deficit reduction. However, this frame also
31 implicitly situates the President as the head of the national family, in charge of finan-
32 cial decision-making. If people are sensitive to this implied mapping, we hypothesized
33 that comparing the federal budget to a household’s would cause the personal financial
34 history of a presidential candidate (e.g., whether they have financial troubles or
35 have accumulated personal wealth) to feature more heavily into evaluations of the
36 candidate.

37 In three experiments, we tested the effects of this metaphorical comparison, focusing
38 on the inferences that it is not necessarily intended to promote (i.e., that a candidate who
39 has grown their wealth would make a better president). In our third experiment, we
40 exposed participants to more realistic rhetorical arguments, by making an explicit com-
41 parison between the head of a household and the President, to test whether a more
42 deliberate use of the comparison has a bigger influence on participants’ voting intentions
43 (Steen, 2011).

1 We predicted that participants who read a report that framed the federal budget as *sim-*
2 *ilar* to a household's would draw the inference that individuals who excel at managing
3 their own household budget would also be better at managing the federal budget (though
4 this is not actually an accurate account of the President's job; Graham, 2015). This would
5 provide reliable evidence that metaphorical framing can in fact influence political deci-
6 sion-making through a process of "structure mapping" knowledge across domains
7 (Gentner, 1983; Gentner & Markman, 1997; Medin, Goldstone, & Gentner, 1993;
8 Tversky, 1977) and go beyond existing work on the role of metaphor in political rhetoric,
9 which has focused largely on questions like: Do political metaphors influence peoples'
10 memory for the messages they frame and perceptions of politicians who used them (Read,
11 Cesa, Jones, & Collins, 1990; see also Bosman, 1987; Mio, 1997; Ottati & Renstrom,
12 2010)?

13 We also predicted that the political ideology of participants might moderate the
14 effects of the metaphorical frame. Past research suggests that subtle framing manipula-
15 tions are most likely to affect those whose ideology predisposes them to be favorable
16 toward a particular message or value, and least likely to affect those who already have
17 a strong ideological commitment in the domain in question (e.g., Landau, Keefer, &
18 Rothschild, 2014; Thibodeau & Boroditsky, 2011, 2013). For instance, in one study,
19 Republicans and Independents were more willing to allocate funding for products and
20 services that were framed as being related to a carbon "offset" program compared to
21 the same products and services that were framed as being related to a carbon "tax";
22 Democrats indicated they would purchase the product no matter how it was framed
23 (Hardisty, Johnson, & Weber, 2010). Because deficit reduction is a more important
24 issue for right-leaning voters, we hypothesized that Republicans would be more
25 susceptible to the framing manipulation.

28 **2. Experiment 1**

29 *2.1. Methods*

30 *2.1.1. Participants*

31
32 Participants ($N = 400$) were recruited and paid from Amazon's Mechanical Turk.
33 Recent work has shown that the political ideology of this population closely mirrors that
34 of the general public (Clifford, Jewell, & Waggoner, 2015). Participants were required to
35 live in the United States and have a good performance rating. The sample size was set to
36 be fairly large in order to ensure a sufficient number of participants who identified as
37 politically Republican—who tend to be under-represented in this population relative to
38 Democrats and Independents—were included. Data were not analyzed from participants
39 who submitted an incorrect completion code or who spent <8-s or more than 120 s read-
40 ing the initial stimulus (median = 20 s). Applying these exclusion criteria left data from
41 336 participants for analysis (51% Male; 46% Democrats, 32% Independents, 22%
42 Republicans).

2.1.2. Materials and design

Participants read one of two descriptions of the federal budget. The two descriptions contained identical information but one emphasized *similarities* between the federal budget and a household budget:

There are several important ways in which the federal budget is similar to a household's. Although only governments can produce money, both have the potential to accumulate debt. Of course, governments have much more control over their revenue: in addition to being able to create money, they have control over tax rates, interest rates, and trade policies. But just like a household, if a government fails to pay their debt, their credit rating declines and they may have a harder time securing a loan in the future.

The other emphasized *differences*:

There are several important ways in which the federal budget is different from a household's. Although both have the potential to accumulate debt, only governments can produce money. Of course, if a household or a government fails to pay their debt, their credit rating will decline and they may have a harder time securing a loan in the future. But unlike households, governments have much more control over their revenue: in addition to being able to create money, they have control over tax rates, interest rates, and trade policies.

Since the goal of the current study was to test whether emphasizing or negating a metaphorical mapping would affect reasoning, we did not include a third "baseline control" condition that omitted the metaphorical frame (see Thibodeau & Boroditsky, 2015, for a detailed discussion of the design and use of control conditions in studies of linguistic framing).

After reading the passage, participants were asked the extent to which they agreed with the following statements on a 5-point scale that ranged from *strongly disagree* to *strongly agree*: "I would vote for a presidential candidate who had problems managing his or her personal assets, as long as I support their broader economic values." And, "I would be more likely to vote for a presidential candidate who had grown his or her wealth."

Then participants were asked how important economic issues were for them in making political decisions (5-point scale) and to rate the similarity between the federal budget and a household budget (5-point scale). Participants were also asked demographic questions, including their age, gender, political affiliation (Democrat, Independent, Republican), and political ideology (0 [*very liberal*], to 100 [*very conservative*]).

2.2. Results

Participants who read that the federal budget was *similar* to a household's, rated the budgets as more similar to each other ($M_{\text{similar}} = 3.36$, 95% CI [3.17, 3.55] compared to $M_{\text{different}} = 2.87$, 95% CI [2.69, 3.05]), indicating that the manipulation had the intended effect, $t[334] = 3.67$, $p < .001$, $d = .405$. There was no difference between groups in the rated importance of economic issues, $t[334] = 0.92$, $p = .360$.

The two questions about voting intentions were somewhat correlated with each other, $r[796] = -.355$, $p < .001$. People who reported that they would vote for a candidate who

had problems managing their personal assets tended to think it was less important for that candidate to have grown their personal wealth.

In a first analysis, the ratings for the two target questions were averaged (reverse-scoring the first). An independent samples *t*-test revealed that participants who had read that the federal budget was *similar* to a household's ($M = 3.78$, 95% CI [3.65, 3.91]) thought the personal financial status of presidential candidates was more important than participants who had read that the federal budget was *different* from a household's ($M = 3.56$, 95% CI [3.43, 3.69]), $t[334] = 2.35$, $p = .019$, $d = .260$.

In a second analysis, we treated responses to the questions separately using a repeated-measures ANOVA and confirmed the influence of the framing manipulation. The model revealed a significant interaction between framing condition and question, $F[1, 335] = 5.50$, $p = .020$, $\eta^2 = .010$. As shown in Fig. 1, participants who read that the federal budget was *similar* to a household's were less likely to say they would vote for a presidential candidate who had personal financial problems ($M_{\text{diff}} = -0.24$, 95% CI [-0.476, -0.004]), $t[334] = 1.98$, $p = .048$, $d = .218$, and marginally more likely to say that they would vote for a candidate who had grown their wealth ($M_{\text{diff}} = 0.20$, 95% CI [-0.002, 0.416]), $t[334] = 1.88$, $p = .062$, $d = .200$.

Including political affiliation (Democrat, Independent, Republican) in the repeated-measures ANOVA to predict responses to the two target questions revealed a significant

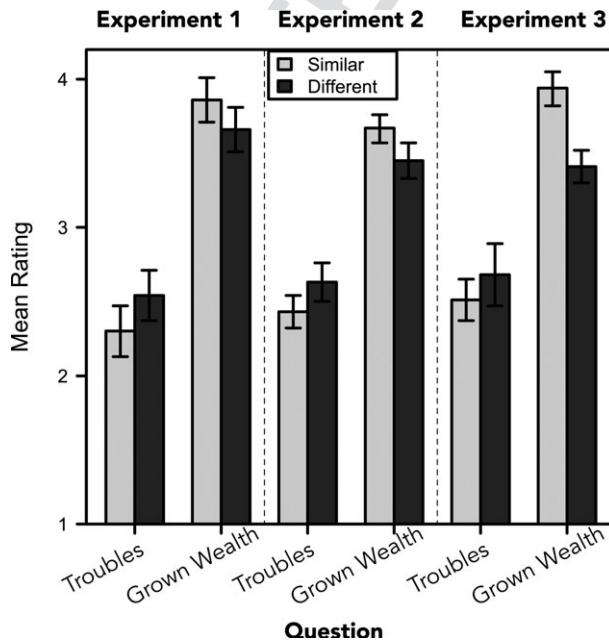


Fig. 1. Mean ratings for two questions about the relevance of a presidential candidate's personal financial situation by framing condition for Experiments 1–3. The first question asked whether participants would vote for a candidate who had personal financial troubles; the second question asked whether participants would be more likely to vote for a candidate who had grown their wealth. Error bars denote 95% CIs for the means.

1 interaction between political affiliation and question, $F[2, 331] = 14.59$, $p < .001$,
2 $\eta^2 = .050$, but not between political affiliation and frame, $F[2, 329] = 0.12$, $p = .889$, or
3 between political affiliation, question, and frame, $F[2, 331] = 1.932$, $p = .146$.

4 Democrats ($M = 2.56$, 95% CI [2.38, 2.73]) and Independents ($M = 2.50$, 95% CI
5 [2.28, 2.72]) said they would be more likely to vote for a candidate who had personal
6 financial troubles than Republicans ($M = 2.03$, 95% CI [1.80, 2.26]), $F[2, 333] = 6.45$,
7 $p = .002$, $\eta^2 = .037$. Democrats ($M = 3.49$, 95% CI [3.33, 3.65]) and Independents
8 ($M = 3.79$, 95% CI [3.61, 3.97]) were less likely to report that they would be influenced
9 by how much a candidate had grown their personal wealth compared to Republicans
10 ($M = 4.25$, 95% CI [4.02, 4.48]), $F[2, 333] = 15.79$, $p < .001$, $\eta^2 = .087$. These results
11 suggest that Republicans may be especially influenced by the personal wealth of a candi-
12 date, since the measure of political affiliation more strongly affected responses to the lat-
13 ter question (i.e., Republicans were much more likely to say they would vote for a
14 candidate who had grown their wealth compared to Democrats and Independents,
15 $\eta^2 = .087$, and only somewhat less likely to say they would vote for a candidate who
16 had a history of personal financial troubles, $\eta^2 = .037$). Consistent with this finding,
17 recent polling has found that registered Republicans are more inclined to support candi-
18 dates who finance their own campaigns compared to registered Democrats (CBS News,
19 2015).

22 3. Experiment 2: Replication

23
24 To confirm the findings of Experiment 1, we sought to replicate the key results using a
25 pre-registered study design: Open Science Framework (osf.io/zcw6y).

27 3.1. Methods

28
29 The materials and design of the confirmatory experiment were identical to those of
30 Experiment 1.

32 3.1.1. Participants

33 We used G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) to compute the sample
34 size needed to detect a difference between two means collected from independent sam-
35 ples. Using an effect size of $d = .2$, and setting α to .05 and β to .8, the analysis sug-
36 gested that about 800 people should be sampled. We then registered the trial on the Open
37 Science Framework, following the analysis of Experiment 1 to indicate exactly how we
38 planned to analyze the data from the confirmatory experiment (osf.io/zcw6y). Data from
39 1,000 people were collected from Turk, using the same inclusion criteria as Experiment
40 1. We excluded data from participants who submitted an incorrect completion code, had
41 participated in the first experiment, or spent less than 8 or more than 120 s reading the
42 passage. This left data from 798 participants for analysis (50% Male; 43% Democrats,
43 35% Independents, 22% Republicans).

3.2. Results

As we found in Experiment 1, participants who read that the federal budget was *similar* to a household's, rated the two budgets as more similar to each other ($M_{\text{similar}} = 3.18$, 95% CI [3.06, 3.30] compared to $M_{\text{different}} = 2.61$, 95% CI [2.49, 2.73]), confirming the effect of the manipulation, $t[796] = 6.63$, $p < .001$, $d = .467$. There was no difference between groups in the rated importance of economic issues, $t[796] = 0.60$, $p = .552$.

Ratings for the two questions about voting intentions were negatively correlated with each other, $r[796] = -.356$, $p < .001$. Reverse-scoring the first question and averaging it with the second revealed that people who read that the federal budget was *similar* to a household's ($M = 3.62$, 95% CI [3.54, 3.70]) considered the personal finances of presidential candidates more relevant than people who had read that the budgets were *different* ($M = 3.41$, 95% CI [3.31, 3.51]), $t[796] = 3.22$, $p = .001$, $d = .225$, consistent with the results of Experiment 1.

A repeated-measures ANOVA revealed a significant interaction between framing condition and question, $F[1, 796] = 10.34$, $p = .001$, $\eta^2 = .010$. When the federal budget was described as *similar* to a household's, people were less likely to say they would vote for a presidential candidate who had personal financial problems ($M_{\text{diff}} = -0.21$, 95% CI [-0.377, -0.043]), $t[796] = 2.42$, $p = .020$, $d = .175$, and more likely to say that they would vote for a candidate who had grown their wealth ($M_{\text{diff}} = 0.23$, 95% CI [0.080, 0.380]), $t[796] = 2.89$, $p = .004$, $d = .213$ (see Fig. 1). Responses to the two questions also differed by political affiliation, $F[2, 792] = 8.18$, $p < .001$, $\eta^2 = .015$: participants' political affiliation more strongly influenced their likelihood of voting for a candidate who had grown their wealth, $F[2, 792] = 21.56$, $p < .001$, $\eta^2 = .051$, than their likelihood of voting for a candidate who had a history of financial problems, $F[2, 792] = 0.21$, $p = .814$. As with Experiment 1, Republicans were most likely to report that they would vote for someone who had grown their wealth ($M_{\text{Rep}} = 3.98$, 95% CI [3.83, 4.14]; $M_{\text{Ind}} = 3.55$, 95% CI [3.42, 3.68]; $M_{\text{Dem}} = 3.37$, 95% CI [3.26, 3.48]). There was no interaction between political affiliation and framing condition (or three-way interaction), mirroring the findings of the initial experiment.

3.3. Discussion

In Experiments 1 and 2, we found a reliable, though moderate influence of the framing manipulation: Participants who read that the federal budget was *similar* to a household's tended to consider the personal finances of a political candidate more relevant to their voting intentions. The results suggest that people used their understanding of household budgeting to structure their reasoning about the hypothetical presidential candidate (who, on this metaphor, would be the head of the national household), which provides compelling evidence that metaphorical messaging campaigns can be effective persuasive tools but may also have unintended consequences.

Contrary to our initial hypothesis, however, we did not find that political ideology moderated the effects of the message frame: Though Republicans (and to some degree,

Independents) were more likely to consider the financial background of a candidate relevant compared to Democrats, political affiliation did not interact with the framing manipulation to affect these judgments.

One possibility is that this pattern of results can be explained by the subtle nature of our experimental stimuli. The materials used in Experiments 1 and 2 were carefully designed to present participants with identical information in order to determine the isolated influence of the framing manipulation per se. Furthermore, the critical mapping between heads of households and heads of state was not explicitly stated, allowing us to test whether people automatically drew inferences about the relevance of the personal financial background of a candidate based on the shared relational structure between the two budgetary domains. This manipulation may have been so subtle that it did not trigger a response one way or another based on the prior ideological commitments of our participants.

In the real world, politicians do not speak so carefully; they often push only one side of the debate and make the desired comparisons explicit in their messaging campaigns. It has been suggested that this *deliberate* dimension of metaphorical discourse may be important for how people respond to a particular message, resulting in greater influence and persuasion (e.g., Steen, 2011; but see Gibbs, 2015). Therefore, it is possible that a more ecologically valid statement that explicitly compares the President to the manager of a household budget and highlights the importance of this mapping would result in a stronger effect of the message frame, especially for those who are predisposed to resonate with or value this metaphorical comparison (i.e., right-leaning voters). To examine this possibility, in Experiment 3 we made several changes to the report in order to make it more consistent with real-world political rhetoric.¹

4. Experiment 3

As with Experiment 2, Experiment 3 was pre-registered on the Open Science Framework (osf.io/zcw6y).

4.1. Methods

4.1.1. Participants

We collected data from 1,000 participants from Turk in Experiment 3, consistent with the sample size of Experiment 2, using the same inclusion criteria as previous experiments. This left data from 554 participants² for analysis (43% Male; 42% Democrats, 34% Independents, 24% Republicans).

4.1.2. Materials and design

One framing condition emphasized *similarities* between federal and household budgets in a way that was more consistent with the explicit rhetoric of politicians:

1 There are several important ways in which the federal budget is similar to a house-
2 hold's. Although only governments can produce money, both have the potential to accu-
3 cumulate debt. Recently, the Congressional Budget Office released a report stating that the
4 U.S. budget deficit for 2016 will increase after 6 years of decline to \$544 billion, which
5 is \$105 billion more than in 2015. Just like a household, if a government fails to pay
6 their debt, their credit rating declines and they may have a harder time securing a loan in
7 the future. The next President of the United States will be charged with managing this
8 budget and one indication of their ability to do so effectively may be seen in their per-
9 sonal financial behavior. For instance, have they been able to manage their own house-
10 hold budget effectively and grown their own wealth?

11 The other framing condition emphasized *differences* between the budgets in a way that
12 was more consistent with the arguments of economists who disagree with this comparison
13 (e.g., Krugman, 2012; Wray, 2010):

14 Despite the claims of some politicians, there are several important ways in which the
15 federal budget is different from a household's. Although both have the potential to accu-
16 cumulate debt, governments have much more control over their revenue; only governments
17 can create money, set tax rates, interest rates, and trade policies. For these reasons, econ-
18 omists argue that comparing the federal budget to a household's is misleading. The U.S.
19 government has maintained some level of debt nearly every year since 1776, which has
20 allowed us to make important investments in infrastructure, foreign affairs, and important
21 domestic programs. As a result, knowing the personal financial history of a candidate
22 may not tell us very much about how effectively they will be able to manage the national
23 economy, especially since institutions like the Treasury and Federal Reserve, which work
24 independently from the President, have a much more direct influence on economic
25 growth.

26 After reading the report, participants answered the same follow-up questions as in the
27 previous experiments.

28 Note that there are several differences between the reports used for Experiment 3. For
29 instance, the condition that highlights *similarities* between federal and household budgets
30 explicitly mentions the dollar amount of the federal deficit; the condition that highlights
31 *differences* instead seeks to put the general idea of maintaining a deficit in historical con-
32 text. The two conditions also reference different federal institutions: the Congressional
33 Budget Office is mentioned in the report that describes *similarities*, while the Treasury
34 and Federal Reserve are mentioned in the report that describes *differences*. The informa-
35 tion included in each report was taken from real-world arguments about the relationship
36 between a household budget and the federal budget (e.g., Krugman, 2012; Team Romney,
37 2012; Wray, 2010). As a result, there are a number of possible reasons why attitudes
38 toward presidential candidates may be affected by the manipulation over and above the
39 metaphorical comparison itself (e.g., the valence of the reports, the particular associations
40 that people have with the institutions listed). Our goal in Experiment 3 was not to isolate
41 a single source of a hypothesized effect (as in Experiments 1 and 2); instead it was to test
42 whether a message that includes the metaphorical mapping—emphasized or negated, and
43 embellished in a realistic way—has an especially pronounced effect on people who are

1 exposed to such an argument. That is, Experiments 1 and 2 present the results of care-
 2 fully controlled stimuli, designed to inform theoretical questions about the effect of
 3 rhetorical metaphors. Experiment 3 is designed to extend these findings and put them in a
 4 more ecologically valid and realistic context.

5 4.2. Results

6 Participants who read that the federal budget was *similar* to a household's rated the
 7 budgets as more similar to each other ($M_{\text{similar}} = 3.50$, 95% CI [3.37, 3.63] compared to
 8 $M_{\text{different}} = 2.49$, 95% CI [2.35, 2.63]), confirming manipulation, $t[552] = 9.88$, $p < .001$,
 9 $d = .838$. There was no difference between groups in the rated importance of economic
 10 issues, $t[552] = 1.701$, $p = .089$, although participants who had read that the budgets
 11 were *similar* reported that the economy was marginally more important ($M_{\text{diff}} = 0.13$,
 12 95% CI [-0.023, 0.283]).

13 As with previous experiments, the two questions about voting intentions were some-
 14 what correlated with each other, $r[552] = -.298$, $p < .001$. Reverse-scoring the first and
 15 averaging it with the second revealed that participants who had read that the federal bud-
 16 get was *similar* to a household's ($M = 3.71$, 95% CI [3.60, 3.82]) thought the personal
 17 financial status of presidential candidates was more important than participants who had
 18 read that the federal budget was *different* from a household's ($M = 3.37$, 95% CI [3.27,
 19 3.82]), $t[552] = 4.74$, $p < .001$, $d = .294$.

20 This influence was confirmed by a repeated-measures ANOVA that analyzed responses
 21 to the questions separately, $F[1, 552] = 22.49$, $p < .001$, $\eta^2 = .028$. As shown in Fig. 1,
 22 participants who read that the federal budget was *similar* to a household's were margin-
 23 ally less likely to say that they would vote for a presidential candidate who had per-
 24 sonal financial problems ($M_{\text{diff}} = -0.17$, 95% CI [-0.368, 0.028]), $t[552] = 1.67$,
 25 $p = .095$, $d = .143$, and more likely to say that they would vote for a candidate who
 26 had grown their wealth ($M_{\text{diff}} = 0.52$, 95% CI [0.159, 1.199]), $t[552] = 6.52$, $p < .001$,
 27 $d = .550$. That is, changing the report to be more consistent with realistic rhetoric led
 28 to a numerically larger influence on the participants' perceptions of the relevance of
 29 candidates' personal finances (Cohen's $d = .26$, $.23$, and $.29$ in Experiments 1, 2, and
 30 3, for the influence of the framing manipulation on the combined ratings of the two tar-
 31 get questions). However, there was no interaction between the framing manipulation
 32 (*similar* or *different*) and experimental materials (*candidate implicitly situated as head*
 33 *of national household* vs. *candidate explicitly situated as head of national household*;
 34 i.e., data from Experiments 1 and 2 vs. data from Experiment 3), $F[1, 1648] = 2.02$,
 35 $p = .155$.

36 As with Experiments 1 and 2, adding political affiliation to the model revealed a sig-
 37 nificant interaction between political affiliation and question, $F[2, 548] = 14.74$, $p < .001$,
 38 $\eta^2 = .035$. Unlike previous Experiments, the model also revealed interactions between
 39 participants' political affiliation and the framing condition, $F[2, 548] = 14.73$, $p < .001$,
 40 $\eta^2 = .028$, and between political affiliation, question, and framing condition,
 41 $F[2, 548] = 6.44$, $p = .002$, $\eta^2 = .015$.

Overall, Democrats ($M = 2.84$, 95% CI [2.69, 2.99]) and Independents ($M = 2.44$, 95% CI [2.28, 2.60]) said they would be more likely to vote for a candidate who had personal financial troubles than Republicans ($M = 2.39$, 95% CI [2.19, 2.59]), $F[2, 551] = 8.52$, $p < .001$, $\eta^2 = .030$. Democrats ($M = 3.46$, 95% CI [3.34, 3.58]) and Independents ($M = 3.76$, 95% CI [3.61, 3.89]) were less likely to report that they would be influenced by how much a candidate had grown their personal wealth compared to Republicans ($M = 3.91$, 95% CI [3.74, 4.08]), $F[2, 333] = 10.22$, $p < .001$, $\eta^2 = .036$.

The three-way interaction between question, frame, and political ideology is illustrated in Fig. 2. It shows that the framing manipulation—embellishing the metaphorical mapping with the kinds of points that are often made by politicians and pundits—was particularly influential for Independents and Republicans, and not influential for Democrats.

5. General discussion

In three experiments, we tested how a common rhetorical metaphor influences peoples' voting intentions. In the first two experiments, participants who read that the budgets were *similar* considered the personal financial history of candidates to be more relevant, despite carefully controlling the information content of the message.

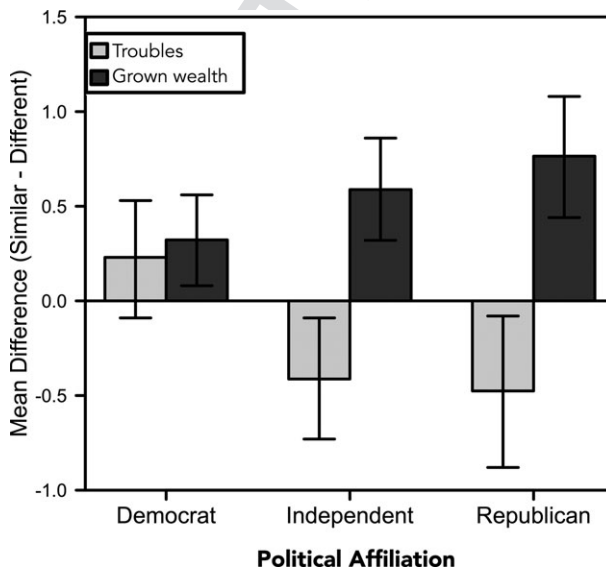


Fig. 2. Mean difference (*similar* framing minus *dissimilar* framing) in ratings for two questions about the relevance of a presidential candidate's personal financial situation by political affiliation. The first question asked whether participants would vote for a candidate who had personal financial troubles; the second question asked whether participants would be more likely to vote for a candidate who had grown their wealth. Error bars denote 95% CIs for the mean differences.

1 In Experiment 3, we modified the reports to make them more consistent with explicit
2 rhetorical arguments presented in the real world (e.g., by referencing specific information
3 about the size of the federal budget deficit in the *similar* condition and by referencing the
4 fact that the U.S. government has been in debt for most of its existence in the *different* con-
5 dition). The findings mirrored the results of our first two experiments and elicited a similar
6 effect size compared to Experiments 1 and 2 among the full sample of participants.

7 Unlike earlier experiments, however, in Experiment 3, we found that the framing manipu-
8 lation affected Independent and Republican participants, but not the Democrats. This is con-
9 sistent with previous research showing that metaphorical framing does not function in a
10 vacuum, but rather interacts with prior beliefs and attitudes in a principled fashion (Hardisty
11 et al., 2010; Landau et al., 2014; Thibodeau & Boroditsky, 2011, 2013). Accompanying
12 more explicit rhetoric with the metaphorical frame in Experiment 3 may have bolstered the
13 influence of the comparison among participants who were more likely to find the message
14 compelling (Republicans) and negated the influence of the comparison among participants
15 who may have found such an argument misleading (Democrats). In other words, a suffi-
16 ciently subtle message may be able to “bypass” peoples’ typical ideological commitments
17 (cf. Petty & Cacioppo, 1979). Such an influence may have a broader, but subtler influence
18 on reasoning compared to more explicit rhetoric, which may have a bigger, but more tar-
19 geted effect on subgroups of people, although further research is necessary to fully tease
20 apart the relationship between the subtlety (or explicitness/deliberateness) of a message
21 frame and prior beliefs and attitudes of individuals.

22 This study has important real-world implications by highlighting the unintended conse-
23 quences of specific metaphorical message campaigns. At the time of writing (March,
24 2016), the United States is in the midst of heated presidential primaries, with several
25 GOP candidates still vying for a shot at the nomination. Interestingly, the personal finan-
26 cial history of several candidates has become fodder for public criticism. For example,
27 Florida Senator Marco Rubio’s personal financial struggles have received a great deal of
28 scrutiny (e.g., Eder & Barbaro, 2015), even as journalists have noted that “The presi-
29 dent’s job isn’t to be accountant-in-chief, and the most business-astute presidents have
30 tended to be mediocre at best in the White House, while failed haberdasher Harry Tru-
31 man is well regarded” (Graham, 2015). Our findings suggest that the comparison between
32 federal and household budgets may be one of the reasons Rubio has had difficulty con-
33 vincing many Republican primary voters to support his campaign, even as wealthy candi-
34 **5** dates like Donald Trump (and Mitt Romney in 2012) have surged in the polls.

35 Taken together, our findings support the view that metaphorical framing can be a pow-
36 erful tool for political persuasion (Lakoff, 2004, 2008) even as they help illuminate the
37 cognitive mechanisms at work in this process.

38 Notes

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42 1. Of note, our first attempt to generate these new materials resulted in a null finding
43 in an initial pre-registered study. However, the data suggested that our stimuli were

problematic for at least two critical reasons. First, because the new materials were so short (just two sentences), they may not have been engaging enough to elicit the level of structure mapping required between the domains to influence reasoning (cf. Gentner, 1983). Second, the complete absence of any reference to possible differences between federal and household budgets in the “similar” condition (and vice versa) may have led participants to generate reactive counterarguments, mitigating the effects of the framing manipulation (Petty & Cacioppo, 1979). See Supporting Information for the full methods and analyses of this experiment.

2. Due to a coding error, participants who had completed Experiments 1, 2, or 3a (see Supporting Information) were not prevented from participating in Experiment 3. As a result, 294 participants completed Experiment 3 after having completed a related study. Data from these participants were excluded from the analysis of Experiment 3.

References

- Bartels, L. M. (2009). *Unequal democracy: The political economy of the new gilded age*. Princeton, NJ: Princeton University Press.
- Blanchette, I., & Dunbar, K. (2002). Representational change and analogy: How analogical inferences alter target representations. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 28, 672.
- Bohan, A., & Keane, M. T. (2004). Towards a computational model of analogical arguments. *Proceedings of the 4th Workshop on Computational Models of Natural Argument*, 4, 65–67.
- Bosman, J. (1987). Persuasive effects of political metaphors. *Metaphor and Symbol*, 2(2), 97–113.
- CBS News. (2015). The race for the 2016 republican nomination. Available at: <https://www.scribd.com/doc/273490309/CBS-News-GOP-presidential-candidates-poll>. Accessed September 19, 2016.
- Charteris-Black, J. (2005) *Politicians and rhetoric: The persuasive power of metaphor*. Palgrave-MacMillan.
- Clifford, S., Jewell, R. M., & Waggoner, P. D. (2015). Are samples drawn from Mechanical Turk valid for research on political ideology? *Research and Politics*, 2(4), 1–9.
- Eder, S., & Barbaro, M. (2015). Marco Rubio’s career bedeviled by financial struggles. *The New York Times*. Available at: <http://www.nytimes.com/2015/06/10/us/politics/marco-rubio-finances-debt-loans-credit.html>. Accessed March 8, 2016.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175–191.
- French, R. M. (2002). The computational modeling of analogy-making. *Trends in Cognitive Sciences*, 6(5), 200–205.
- Gentner, D. (1983). Structure mapping: A theoretical framework for analogy. *Cognitive Science*, 7, 155–170.
- Gentner, D., & Markman, A. B. (1997). Structure mapping in analogy and similarity. *American Psychologist*, 52, 45–56.
- Gibbs, R. W. (2015). Does deliberate metaphor theory have a future? *Journal of Pragmatics*, 90, 73–76.
- Graham, D. A. (2015). How much do Marco Rubio’s personal finances matter? *The Atlantic*. Available at: <http://www.theatlantic.com/politics/archive/2015/10/marco-rubio-personal-finances-jeb-bush-david-rivera/413401/>. Accessed March 8, 2016.
- Hanne, M. (2015). An introduction to the “Warring with Words” project. In M. Hanne, W. D. Crano, & J. S. Mio (Eds.), *Warring with words: Narrative and metaphor in politics* (pp. 1–50). New York, NY: Psychology Press.

- Hardisty, D. J., Johnson, E. J., & Weber, E. U. (2010). A dirty word or a dirty world? Attribute framing, political affiliation, and query theory. *Psychological Science*, *21*, 86–92.
- Hoyt, C. L., Burnette, J. L., & Auster-Gussman, L. (2014). “Obesity is a disease”: Examining the self-regulatory impact of this public-health message. *Psychological Science*, *25*, 997–1002.
- Jones, J. M. (2012). Economy is paramount issue to US voters. *Gallup Polls*. Available at: <http://www.gallup.com/poll/153029/Economy-Paramount-Issue-Voters.aspx>. Accessed February 17, 2016.
- Jones, J. M. (2015). Economy trumps foreign affairs as key 2016 election issue. Available at: <http://www.gallup.com/poll/183164/economy-trumps-foreign-affairs-key-2016-election-issue.aspx>. Accessed February 17, 2016.
- Krugman, P. (2012). Nobody understands debt. *The New York Times*. Available at: http://www.nytimes.com/2012/01/02/opinion/krugman-nobody-understands-debt.html?_r=0. Accessed February 17, 2016.
- Lakoff, G. (2004). *Don't Think of an Elephant! know your values and frame the debate: The essential guide for progressives*. White River Junction, VT: Chelsea Green Publishing.
- Lakoff, G. (2008). *The political mind: Why you can't understand 21st-century politics with an 18th-century brain*. Penguin.
- Landau, M. J., Keefer, L. A., & Rothschild, Z. K. (2014). Epistemic motives moderate the effect of metaphoric framing on attitudes. *Journal of Experimental Social Psychology*, *53*, 125–138.
- Medin, D. L., Goldstone, R. L., & Gentner, D. (1993). Respects for similarity. *Psychological Review*, *100*, 254–278.
- Mio, J. S. (1997). Metaphor and politics. *Metaphor and Symbol*, *12*(2), 113–133.
- Ottati, V. C., & Renstrom, R. A. (2010). Metaphor and persuasive communication: A multifunctional approach. *Social and Personality Psychology Compass*, *4*(9), 783–794.
- Petty, R. E., & Cacioppo, J. T. (1979). Issue involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses. *Journal of Personality and Social Psychology*, *37*, 1915.
- Read, S. J., Cesa, I. L., Jones, D. K., & Collins, N. L. (1990). When is the federal budget like a baby? Metaphor in political rhetoric. *Metaphor and Symbolic Activity*, *5*, 125–149.
- Sopory, P., & Dillard, J. P. (2002). The persuasive effects of metaphor: A meta-analysis. *Human Communication Research*, *28*, 382–419.
- Steen, G. J. (2011). The contemporary theory of metaphor—now new and improved! *Review of Cognitive Linguistics*, *9*(1), 26–64.
- Team Romney. (2012). What if your family budget was the federal budget?. Available at: <http://web.archive.org/web/20120628133548/http://www.mittromney.com/blogs/mitts-view/2012/04/what-if-your-family-budget-was-federal-budget-infographic?> Accessed February 17, 2016.
- Thibodeau, P. H., & Boroditsky, L. (2011). Metaphors we think with: The role of metaphor in reasoning. *PLoS ONE*, *6*, e16782.
- Thibodeau, P. H., & Boroditsky, L. (2013). Natural language metaphors covertly influence reasoning. *PLoS ONE*, *8*(1), e52961.
- Thibodeau, P. H., & Boroditsky, L. (2015). Measuring effects of metaphor in a dynamic opinion landscape. *PLoS ONE*, *10*(7), e0133939.
- Tversky, A. (1977). Features of similarity. *Psychological Review*, *84*, 327.
- Wray, L. R. (2010). The federal budget is NOT like a household budget—here's why. *Naked Capitalism*. Available at: <http://www.nakedcapitalism.com/2010/02/wray-the-federal-budget-is-not-like-a-household-budget-%E2%80%93-why.html>. Accessed February 17, 2016.

Supporting Information

Additional Supporting Information may be found online in the supporting information tab for this article:

Data S1. XXXXXXXXXXXXXXXXXXXX.