Fiscal Framing: Vividness and Numerosity Biases in Perceptions of Public Spending☆

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Abstract

Politicians like to talk in great length and with plenty of detail about new spending and tax cuts. However, spending cuts or new revenue are often presented in much less vivid terms. Here we present evidence on how popular and unpopular fiscal policies are actually presented and how the mode of presentation affects voter preferences for public spending.

We expect voters to be able to distinguish between levels of vividness in presentations of public spending. Furthermore, we expect voters to express more support for vividly presented, disaggregated presentations of public spending. We test the first expectation by exposing a nationally representative sample (N=1,505) to spending items from real budget laws, finding support for our hypotheses. The second expectation will be tested in a not yet conducted survey experiment on a nationally representative sample (N≈1,500), the design of which is presented here.

Keywords: policy vividness, budgets, spending preferences, cognitive biases, discrete choice

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Introduction

As noted by early scholars of public opinion, citizens of modern, democratic mass societies are faced with the difficulty of developing opinions about societal issues based only on their own, local experience (Delli Carpini and Keeter 1996). Pointing to this tension between voters' subjective experience and society at large, Lippmann (1932) argues that "[t]he only feeling that anyone can have about an event he does not experience is *the feeling aroused by his mental image of that event* (...) For the real environment is altogether too big, too complex, and too fleeting for direct acquaintance. We are not equipped to deal with so much subtlety, so much variety, so many permutations and combinations" (emphasis added).

Perhaps nowhere is the difficulty of human cognition in understanding large-scale phenomena as apparent as in the field of fiscal policy. While almost everyone deals regularly with their personal finances, the issue of fiscal policy charges citizens with the task of comparing amounts several orders of magnitude larger than what they have ever personally handled. For example, debate over the design of 2009's American Recovery and Reinvestment Act revolved around the proper size of the stimulus, with proposals ranging from 200 billion dollars to more than 1 trillion dollars (Malhotra and Margalit 2010; Scheiber 2012). How are citizens to make sense of such vast numbers?

We propose that insights from cognitive and evolutionary psychology can help make sense of how citizens solve this task. Specifically, we propose two heuristics that citizens are likely to use to assess the size and significance of items of public spending: the *semantic vividness* of the item (hereafter vividness) and its *numerosity*, i.e. its degree of disaggregation into minor parts. Citizens' reliance on these heuristics implies that they are likely to ascribe more value to vividly presented, disaggregated spending items compared to less vividly presented, aggregated ones, even when items are substantively and numerically the same.

We test this theoretical prediction using two large, nationally representative surveys. Study 1, an observational study, shows that when exposed to spending items from real budget laws, voters distinguish between levels of semantic vividness and are significantly

more supportive of vividly presented spending. The effects of vividness and numerosity are difficult to disentangle observationally. Hence, study 2 seeks to isolate the effects of each by exposing respondents to hypothetical sets of spending items where semantic vividness and numerosity are independently varied.

At at more general level our research interest is motivated by understanding the "psychological political economy" (McCaffery and Baron 2006) of public finances. This agenda aims to link psychological insights of human judgment and decision making with macro-level decisions regarding the presentation and structure of public finances (Krishna and Slemrod 2003; Olsen 2013b). That is, by studying how vividness and numerosity shape citizens' evaluation of public finances, we are able to formulate predictions about how potential biases feed into the way policy makers design and present public finances.

In the following, we describe key findings from the existing literature, followed by theoretical predictions and presentations of studies 1 and 2. Lastly, we discuss the study's implications for theories of democratic competence and political cognition.

Argument: Numerosity, Vividness, and Budgets

The argument of this study aims to tie together recent empirical findings in political science with known regularities in cognitive and evolutionary psychology. The empirical point of departure is an experiment reported in Grimmer et al. (2012, study 2). The purpose of the experiment is to test the effect of legislator credit claiming for particularistic spending on voter credit allocation; a large literature in political economy assumes a positive effect, i.e. that particularistic spending by incumbents builds voter support (Levitt and Snyder Jr 1997). In order to test this expectation, the authors expose experiment participants to email messages about legislator-sponsored spending. Surprisingly, the authors find that voter support is highly sensitive to the *frequency* of reported spending, yet beyond a low baseline virtually insensitive to *amount* spent. The experiment yields the counter-intuitive result that participants reward incumbents significantly more for five messages reporting a total spending of 176,000 dollars than for one message reporting spending of 1.5 million dollars.

While the result of the experiment is compelling, it leaves open the question of *why* participants reacted more strongly to the high-frequency, small-amount condition. As the authors themselves point out, the effect of frequency is empirically in line with experimental results showing a 'mere exposure' effect (Zajonc 1968) and on-line processing among voters in political campaigns (Lodge et al. 1995).

We put forward an account, based on evolutionary and cognitive psychology, of why we might expect voters to overestimate the value of small, concrete amounts of spending relative to large, abstract forms of spending. We conceive of this tendency to reflect two analytically distinct perceptual biases, though both of them reflect the basic distinction between the small scale of everyday human perception and the large scale of fiscal policy.

Semantic vividness: the role of mental imagery

Lippmann's last sentence above argues that humans are insufficiently "equipped" to comprehend "too big, too complex" modern society. Although preceding its modern incarnation by decades, the sentence thus presages a core tenet of evolutionary psychology: the idea that while most individuals today live in societies comprised of millions, the evolved human psyche is adapted to social life in hunter-gatherer societies, where groups were far smaller, likely on the order of 100-200 individuals (Dunbar 1993).

A recent strand of inquiry in political science explores how citizens understand political issues in terms of evolved cognitive categories (Petersen 2012; Petersen and Aarø e 2013). Similarly, a classic argument in political communication states that the distorting influence of television news is partly attributable to its reliance on episodic, i.e. concrete, person-based, as opposed to thematic, i.e. abstract, fact-based news frames (Meehl 1954; Iyengar 1994; Aarø e 2011).

Zillmann (1999) has noted that media consumers pay "disproportional attention to concrete, often vividly displayed events". Relying on (Nisbett and Ross 1980, 45) vivid information is defined by its ability "to attract and hold our attention and to excite the imagination, to the extent that it is: (a) emotionally interesting, (b) concrete and imagery-provoking, and (c) proximate in a sensory, temporal or spatial way".

At the center of these arguments is the question of how fundamental categories of

social cognition shape moral attribution in the political realm. This study adopts the theoretical emphasis on the importance of evolved cognitive functions, but shifts its focus from moral attribution to *value assessment*: how do citizens apply evolved cognition to the problem of assessing the value of public spending?

As the first part of this puzzle, we adopt from Petersen and Aarø e (2013) the idea that political cognition is partly an exercise of 'decoupled cognition', i.e. the reliance, given sparse information contexts, on mental simulations of unseen phenomena. In other words, when faced with a lack of information but the necessity of arriving at a decision, citizens translate what limited information they may have into vivid mental images which are then evaluated (Schacter and Addis 2007).

As we will show, the condition of informational sparseness is very constraining in the realm of fiscal policy, where citizens are often asked to assess the value of vast amounts of spending based on a minimum of informational cues. As a result, decoupled cognition is likely to play an important role in citizens' reasoning about public spending.

A key implication of this idea is that, ceteris paribus, highly vividly presented public spending will command higher levels of public support, since the benefits associated with the spending are more cognitively and emotionally engaging (Prediction 1). Though this study focuses on the spending side, the argument conversely implies that vividly presented taxes will engender stronger public opposition (see McCaffery 1993; Finkelstein 2009).

Numerosity: the role of disaggregation

Our ability to process, evaluate, and store numbers in memory is highly constrained. We become very easily cognitively taxed when dealing with even the most simple numerical tasks. When dealing with numbers beyond three our failure rate increases (Deahene 2010).

On this backdrop it is no surprise that the constant stream of extremely large numbers flowing from the political debate over public finances does not fit very well with human number processing capabilities. We are therefore very prone to rely on heuristics when dealing with number tasks – even when making important decisions in business (Thaler 1985; Lacetera et al. 2012) or politics (Ansolabehere et al. 2012; Malhotra and Margalit 2010; Olsen 2013a)

One such heuristic is that of *numerosity*. The *numerosity heuristic* denotes the tendency to infer the size of a stimulus from the number of units it is divided into (Russo 1977; Poulton 1982; Pelham 1994). The underlying functional heuristical intuition is that many units of something often turns out to be a larger quantity in the aggregate than fewer units of something.

The numerosity heuristic is not exclusive to humans: in an experiment, Capaldi and Miller (1988) found that rats appear to apply the heuristic, preferring four 75-mg food pellets over a single 300-mg food pellet. Like the reliance on vividness, we conceive of the numerosity heuristic as an evolved, adaptive trait. In the ancestral environment, where exchange was based on barter rather than a monetary system, numerosity was likely highly correlated with quantity, since abstract representations of large quantities did not exist (Pelham 1994, p. 105).

Since number processing is cognitively taxing, the numerosity heuristic functions as a 'fast and frugal' heuristic serving to provide quick, approximate value assessments (Gigerenzer et al. 2000). Indeed, even in modern settings, when not dealing with representations of large numbers, numerosity and and actual quantity will often be correlated. In many cases we are therefore well served by encoding many bits and pieces as 'more' than fewer bits and pieces.

However, sometimes we are ill advised to use numerosity as a cue for quantity. Anomalies arise if we routinely estimate equivalent amounts to differ because one of them is presented in fewer units. In communications there is evidence that many weak arguments are strong than one or a few strong ones (Petty and Cacioppo 1984; Lodge et al. 1995).

The numerosity heuristic has also been identified as important for matters closer to politics. For instance, it has been seen as the underlying mechanism for the money illusion where individuals pay disproportionate attention to nominal values when dealing with unfamiliar currencies (Soman et al. 2002; Gamble 2007).

Here we argue that the biases stemming from a numerosity heuristic will tend to be magnified when citizens apply it for making decisions on complex questions in large scale societal settings. In line with Grimmer et al. (2012) we expect that the numerosity

heuristic introduces a decoupling of the amount of public spending and the perception of public spending. Specifically, we expect that the exact same amount of spending with the exact same substantial content will be evaluated more favorably if divided on more budget items (Prediction 2).

Empirical Setting

The empirical context of the study is the yearly political agreements over Danish budget laws, which provide the legal basis for all public spending in Denmark. The budget laws are constitutionally enshrined in that each year, the government must secure a parliamentary majority in favor of a budget law for the coming year. If it fails to do so, the government must resign and call for a new election.

Specifically, we focus on summary presentations of budget agreements, which publicized each year immediately after an agreement is made. Figure 8 in the appendix provides an example of a summary. As shown, the agreement reflects new public spending of 6,514 million Danish kroner, equivalent to about 0.3 percent of GDP or 0.6 percent of all public spending. In other words, most public spending rolls over year-to-year, while the budget agreement dictates spending on a small number of politically important areas.

The yearly Danish budget law is interesting for three reasons. First, due to the law's constitutional significance the negotiations over next year's law are subject to intense political attention. Hence, the content of each year's agreement receive considerable media exposure. For the average voter, budget agreements are thus a significant part of their impression of governmental policy.

Second, budget law agreements are a rare case of relatively unmediated political communication between elected officials and voters. The specific composition and wording of the budget agreement is negotiated personally by party leaders, and the publicized agreement is widely reported in mass media. Hence, the setting allows us to study near-direct, and possibly strategic, communication of public policy by incumbents to constituents.

Lastly, the budget laws vary considerably in in terms of the two dimensions studied here, i.e. semantic vividness and numerosity. As for semantic vividness, some items are

very specific, such as "Cancer plan III, including 42 hospice spaces", or target strongly defined groups, e.g. "Improvement for sick, vulnerable, and weak groups". In other instances the items are formulated very vaguely, e.g. "Other initiatives to improve science and education" or "Improved prevention". As for numerosity, the level of disaggregation into separate spending items similarly varies considerably across agreements.

Study 1

The purpose of Study 1 is to measure how voters perceive and encode spending items drawn from real budget law agreements.

Data

Respondents for a survey were recruited via YouGov's Danish online panel (n=1505). All sampled respondents are between the age of 18 to 74 with pre-stratification on age, gender, education, geography, and political party identication. Table 1 report on a number of descriptive statistics for the obtained sample. The sample is highly diverse on all demographic and political variables.

In the survey respondents are asked to rate budget items on a number dimension (as we will outlined below). The budget items where obtained by collecting a data set of all "new initiatives" on the budget laws from 2005 to 2012.[1] All new initiatives are listed on a single page (usually the third page) in the short form presentation of the budget agreement. This yielded a set of 183 separate spending items each with a unique description. The budget item descriptions are very short as the examples provided above. Median character length was 49.

Design

In the survey the respondent where randomly assigned to one of three tasks. The three tasks aimed at measuring 1) the vividness of each spending item, 2) the perceived costs of the item, and 3) to what extend the item seemed favorable in the eyes of voters.

[1]Budget agreements prior to 2005 are not available in a comparable format.

Table 1: Descriptive statistics for the sample

Variable	
Gender (male)	50.4 %
Age	
Mean	51.3
SD	14.7
Education	
1=High school or less	15.3 %
2=Vocational training	25.5 %
3=Short-cycle tertiary	13.8 %
4=Medium-cycle tertiary	30.4 %
5=Long-cycle tertiary or higher	13.6 %
Government party voter	41.5 %

Note: N=1505. CAWI survey.

Table 2 presents the description of each task which the respondents where presented with. All three tasks outlined the same basic introductory text on the budget law.[2] Hereafter respondents received three different task description depending the task their had been assigned to.

In each task respondents was asked to rate three budget items. The budget items were randomly drawn from the data set containing the 183 collected items from the actual budget agreements. Respondents provided their score for each item on separate screens.

For all three tasks the respondents should provide their assessment on a 101-point scale ranging from 0 to 100. Median rating times for three budget items was about 30 seconds with no substantial variation between the three types of tasks.

Results

Table 3 presents descriptive statistics on how the respondents scored the budget items for each of the three tasks. The univariate distribution of each variable is shown in figure 1. On average all budget items obtained a higher support score than for vividness and costs. This is unsurprising, as voters generally view spending (in isolation) favorably.

Next we turn to how the different measures are correlated. In order to do this we created a new data set which aggregated all responses for all budget items for each of the tasks. Hereby we obtained an average vividness, support, and perceived cost score for each of the 183 budget items. It is important to note that our design implies that

[2]A screen cap of a task as seen by the respondents is presented in the appendix.

Table 2: Design for Study 1

Introductory text		
Every year the Parliament approves a budget law which determines how public finances are used. In the following you will be presented for a number of initiatives from various budget law agreements.		
Measure	**Task**	**Scale**
Vividness	Sometimes it is very easy to imagine what an initiative is about. In other instances it not that clear. For each of the following initiatives, please state how easy it is for you to imagine what the initiative is about.	101-point scale: 0 = "Not at all easy to imagine", 100 = "Very easy to imagine"
Perceived cost	Some initiatives are cost relatively little, as little as 1 million kroner. Other initiatives are relatively costly with a cost of up to 1.000 million kroner. For each of the following initiatives, please state your best guess as to whether the initiative is relatively low or relatively high cost.	101-point scale: 0 = "relatively cheap", 100 = "relatively expesive"
Support	Some initiatives may fund areas where you support more public spending. Others may fund areas where you do not believe funding should be increased. For each of the following initiatives, please state whether you support or oppose increasing public spending in that area.	101-point scale: 0 = "strongly opposed to the initiative", 100 = "strongly support the initiative"
...		

Table 3: Summary statistics for vividness, support, and perceived cost

Statistic	N	Mean	St. Dev.	Min	Max
Vividness	1,509	53.538	22.904	0	100
Support	1,512	61.562	20.826	1	100
Perceived cost	1,494	55.035	20.438	2	100

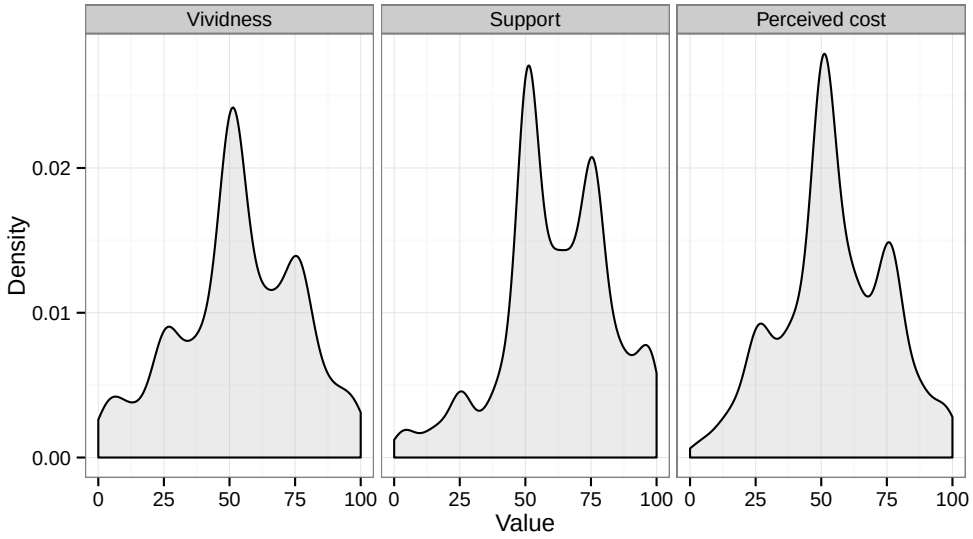

Figure 1: Density of respondent scores for vividness, support, and perceived cost across all initiatives.

the correlations are 'out of sample' predictions in that we correlate measures obtained in three independently sampled groups of respondents.

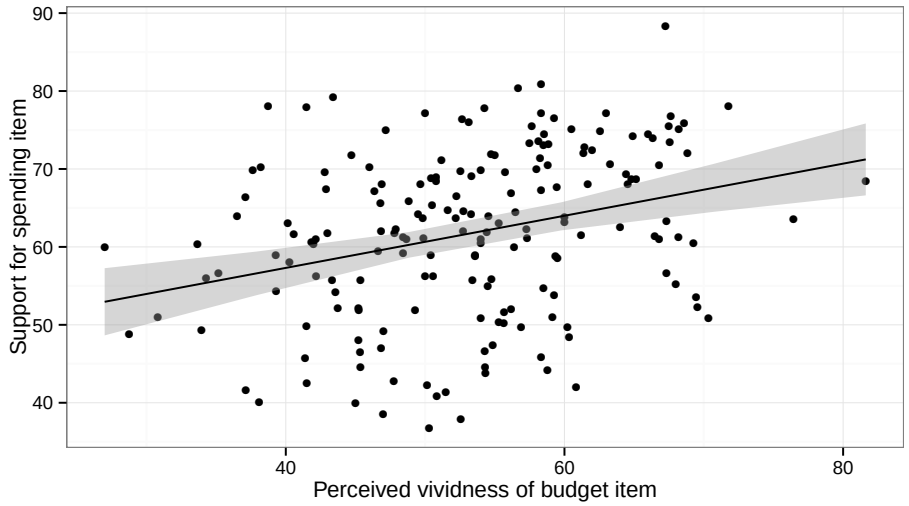

Figure 2: Perceived vividness and support for spending across spending items.

As shown in figure 2, perceived vividness exhibits a clear positive association with political support ($\beta = .33$, $p < .001$). This finding is consistent with the multiple studies that find positive vivid frames to be more emotionally engaging (Iyengar 1994), gain more attention (Zillmann 1999), and be more easily transmitted (Petersen and Arøe 2014). This

seems in particular in line with studies of episodic frame strength which indicate that vividness persuades by triggering an emotional response (Aarø e 2011).

Figure 3 shows that perceived vividness and perceived cost of spending are not correlated ($\beta = .05$, $p = 0.49$). That is, more vividly described items do not sound more or less costly.

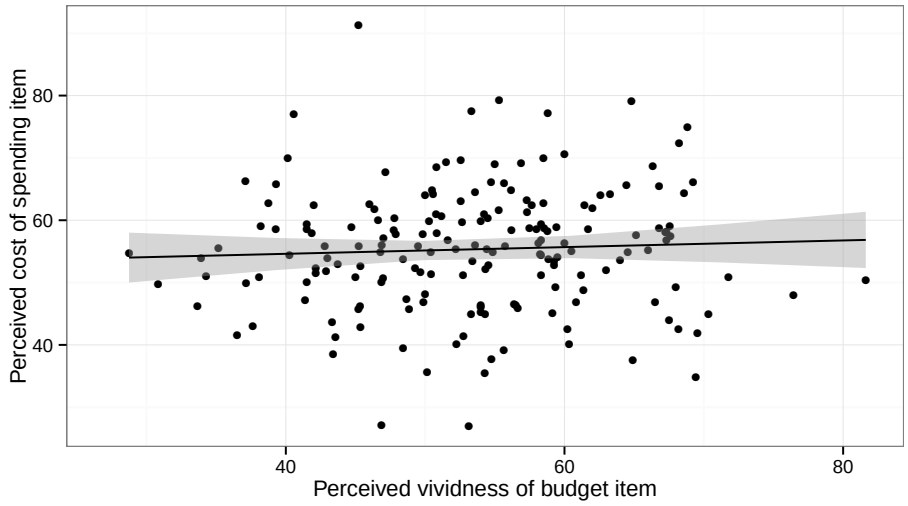

Figure 3: Perceived vividness and perceived cost of spending across spending items.

Figure 4 shows the correlation between the perceived costs and support for a spending item. It shows a weak positive correlation between perceived costs and support ($\beta = .16$, $p < .05$).

The data also allows us to test the associations with the actual cost of each spending item. As shown in figure 5, voters are capable of discerning between high- and low-cost spending items, perceived and logged actual cost are significantly correlated ($\beta = .04$, $p < .001$).

Since low-cost spending items are often narrowly targeted to specific tasks, we expected vividness and actual cost to be negatively correlated, so that low-cost spending items would be perceived more vividly. However, as shown in figure 6, this is not the case. There is effectively no correlation between vividness and the actual cost of spending items ($\beta = .00$, $p = .984$).

Finally, we test to what extent vividness is correlated with support if we control for

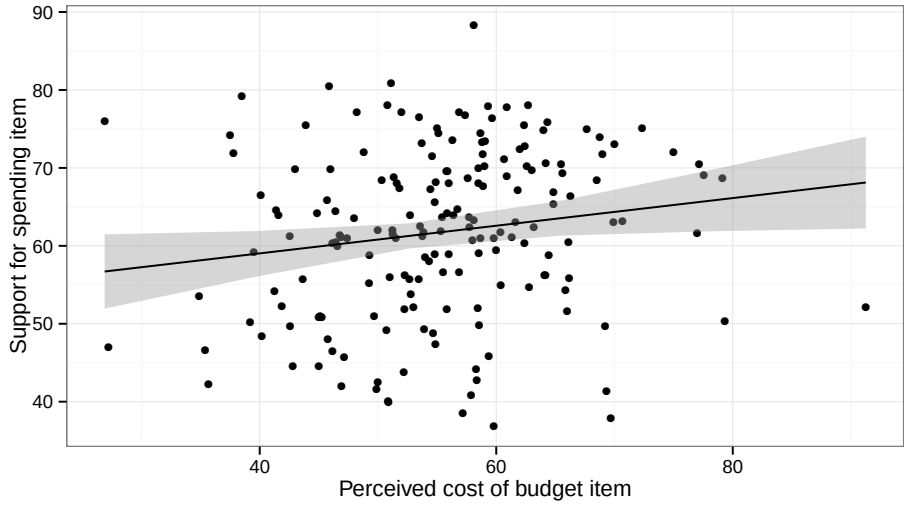

Figure 4: Perceived cost and support for spending across spending items.

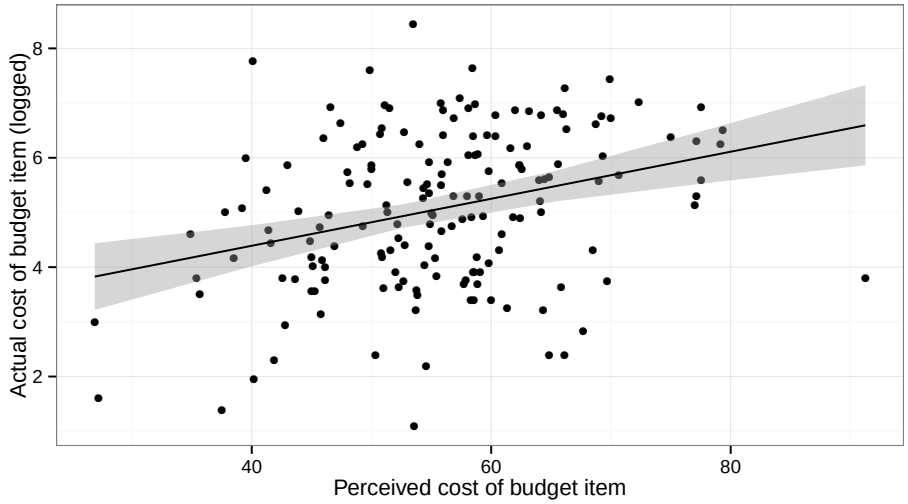

Figure 5: Perceived cost and logged actual cost.

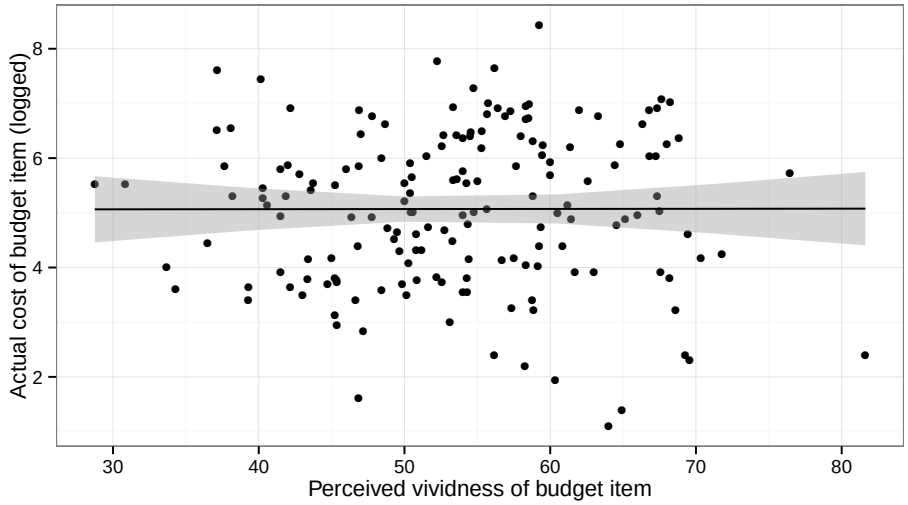

Figure 6: Vividness and logged actual cost.

length of the budget item description and perceived costs . Table 4 reports on a set of simple OLS regression models controlling for these factors. As shown, the association between vividness and support is robust to the inclusion of controls for description length (in number of characters) and perceived cost. The robustness suggests that the measure captures a semantically distinct dimension of the presentation of each item of public spending.

Table 4: Item-level predictors of voter support

	Average support		
	(1)	(2)	(3)
Vividness	0.334***	0.288***	0.288***
	(0.078)	(0.078)	(0.080)
Description length		0.073***	0.104***
		(0.027)	(0.028)
Perceived cost			0.140*
			(0.075)
Actual cost (logged)			1.711***
			(0.571)
Constant	43.926***	42.549***	24.863***
	(4.224)	(4.180)	(6.058)
N	183	183	169
R^2	0.092	0.129	0.217
Adjusted R^2	0.087	0.119	0.198
Residual Std. Error	10.269 (df = 181)	10.088 (df = 180)	9.526 (df = 164)
F Statistic	18.385*** (df = 1; 181)	13.291*** (df = 2; 180)	11.387*** (df = 4; 164)

*p < .1; **p < .05; ***p < .01

Study 2

The purpose of the second study is to understand how the vividness and numerosity of budget items affect voter support of full budget agreement. We have yet to conduct this study. But in the following we will outline the data and design which plan to use.

The main purpose of the study is do separate numerosity effects from the vividness of budget items.

Data

Respondents for a survey will be recruited via YouGov's Danish online panel (N=1000–1500). All sampled respondents will be between the ages of 18 to 74 with pre-stratification on age, gender, education, geography, and political party identication. That is, we aim to apply a sample with the same characteristics as used for study 1.

Design

In the experiment respondents are randomly assigned to one of four conditions reflecting the dimensions high/low vividness of budget items and high/low numerosity of the budget items. In each condition respondents are presented with a full budget agreement. However, the budget agreement is compiled of different budget items across all the real budget agreements scored in study 1.

From the average scores in study 1 we picked high and low vividness budget items within three major policy areas: 1) health care, 2) education, and 3) social policy. For each policy area we picked three policy items whereby each full budget agreement contained of nine budget items. An outline of the four conditions is presented in table 5.

The nine high vividness budget items had an average score of 66.3 ($SD = 4.5$). The nine budget items in the low vividness condition had an average of 44 ($SD = 5.7$). In sum, we end up with budget agreement that vary substantially in their vividness. By using budget items already validated by voters as either high or low vividness we make sure that our experiment actually manipulates the overall perceived vividness of a budget agreement.

However, while we deliberately wanted to make sure the items differed in terms of their vividness we also wanted to make sure that they did not differ in terms of popularity and perceived costs. Our aim is to independently estimate how the overall vividness and numerosity of a budget agreement affect citizens perception of if. Accordingly, we want to isolate the combined vividness and numerosity effect from the individual items' favorability and perceived cost.

We therefore choose budget items which not only differed markedly on vividness but at the same time where very similar in terms of average support and perceived costs. As shown in figure 7 there are no significant differences on these two dimensions between the low and high vividness budget agreements.

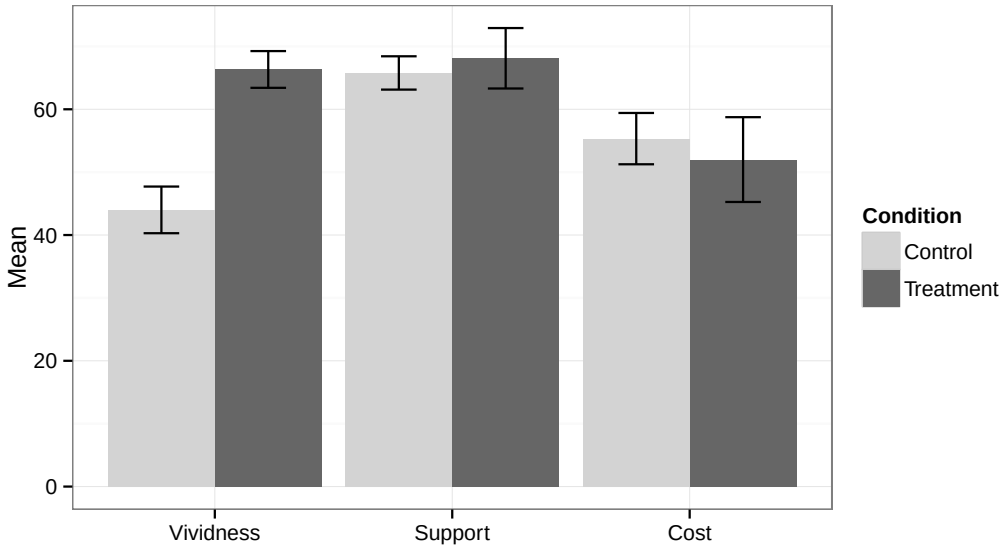

Figure 7: Manipulation and balance checks for treatment and control conditions in study 2, as described in table 5. Error bars represent 95 pct. confidence intervals. The treatment successfully manipulates average vividness across the two conditions (t=-9.3,p<.001), but is balanced across support (t=-.8,p=.42) and perceived cost (t=.8,p=.42).

Table 5: Design for Study 2

Introductory text

Every year the Parliament approves a budget which determines how public finances are used in the coming year. In the following you will be presented with an example of such budget outlining new areas of spending.

Take some time to carefully read the budget. We will ask you to consider, if the overall budget is a very good way of spending public finances or very poorly way of spending public finances.

101-point scale: 0 = "Very poor way of spending public finances", 100 = "Very good way of spending public finances".

Treatment A	*Treatment B*	*Treatment C*	*Treatment D*
High vividness, high numerosity	*High vividness, low numerosity*	*Low vividness, high numerosity*	*Low vividness, low numerosity*
Health care – Shorter hospital admission times and better diagnosis: X_1 million. – Improvement for sick, vulnerable, and weak groups: X_2 million. – Cancer plan III, including 42 hospice spaces: X_3 million.	**Health care:** $\sum_{i=1}^{3} X_i$ million. – Shorter hospital admission times and better diagnosis – Improvement for sick, vulnerable, and weak groups – Cancer plan III, including 42 hospice spaces	**Health care:** – The commmon medicine card: X_1 million. – Improved prevention: X_2 million. – Elimination operations and waiting times: X_3 million.	**Health care:** $\sum_{i=1}^{3} X_i$ million. – The commmon medicine card – Improved prevention – Elimination of operation and waiting times
Education – An education for every young person: X_4 million. – More and better education: X_5 million. – At least half of all youth shold have a post-secondary degree: X_6 million.	**Education:** $\sum_{i=4}^{6} X_i$ million. – An education for every young person – More and better education – At least half of all youth should have a post-secondary degree	**Education:** – Reading fond for public schools: X_4 million. – High schools: X_5 million. – Other initiatives to improve science and education: X_6 million.	**Education:** $\sum_{i=4}^{6} X_i$ million. – Reading fond for public schools – High schools – Other initiatives to improve science and education
Social welfare – Improvement of welfare and services for the elderly: X_7 million. – Public pool of funds: Weak groups in the labor market: X_8 million. – Safety and security: Safe public spaces and increased video surveillance: X_9 million.	**Social welfare:** $\sum_{i=7}^{9} X_i$ million. – Improvement of welfare and services for the elderly – Public pool of funds: Weak groups in the labor market – Safety and security: Safe public spaces and increased video surveillance	**Social welfare:** – Public pool of funds: Disabled: X_7 million. – The welfare agreement, including prevention of attrition: X_8 million. – Improvements of persons on disability retirement under the old regime: X_9 million.	**Social welfare:** $\sum_{i=7}^{9} X_i$ million. – Public pool of funds: Disabled – The welfare agreement, including prevention of attrition – Improvements of persons on disability retirement under the old regime

The second dimension which we wish to manipulate is the overall numerosity of the budget agreement. We do this by varying the *number* of specified DKK amounts (in millions) in the budget agreements. Specifically, in the high numerosity condition each of the nine budget items is assigned a specific amount, while in the low numerosity condition only the policy areas are assigned amounts.

A fundamental challenge to this design is to avoid that a possible numerosity effect (or lack thereof) is driven by the specific spending amounts we have assigned to each budget item. That is, under the low numerosity condition, respondents can make all sorts of assumptions about how the sub totals for each policy area are divided across the individual budget items. Thus, if we impose fixed amounts in the high numerosity condition we are making a strong assumption that the distribution of millions among budget items does not affect respondents.

In order to avoid making this assumption we choose to randomize the distributions of spending within areas. The amounts X_1 to X_9 are each drawn from an uniform distribution ranging from 10 to 3,000 million. In the high-numerosity condition, these amounts are then assigned to each budget item (cf. the X_i's in table 5).

In the low-numerosity condition, we add up the budget items under a policy area and assign them as sub totals (cf. the $\sum X_i$'s in table 5). This ensures that on average, the high-numerosity condition does not contain additional information about the distribution of spending across items. We hereby end up with what is essentially an equivalence framing experiment in which the numerosity conditions on average only differ in how many portions into which the total spending of a budget agreement is divided.

For the out outcome measure we ask respondents to evaluate the extend to which the budget over all is a good or poor way to spend public finances. They are asked to provide their evaluation on a 101-point scale: 0 = "Very poor way of spending public finances", 100 = "Very good way of spending public finances".

Results

We have no results for study 2 as we are still working on the experiments for this study.

General discussion

The aim of this paper was to understand how the vividness and numerosity of public finance agreements affect voters' evaluation of public policy.

Our main expectation was that these heuristics implies that citizens' are likely to ascribe more value to vividly presented, disaggregated spending items compared to less vividly presented, aggregated ones, even when items are substantively and numerically the same.

In study 1 we found that the vividness of short statements about budget items is positively correlated with support for these items. Importantly these associations were found by correlating measures aggregated from two independent samples. These findings were in line with studies denoting the profound effect of vivid (episodic) frames on public opinion.

Study 1 one adds to these studies that even very de-contextualized and subtle stimuli from public policy descriptions of a few word can vary substantially in vividness with large effects on public support.

In study 2 we aim to experimentally separate numerosity and vividness. We expect that numerosity and vividness independently increase support for public spending, even across presentations of substantively identical bundles of spending.

At the more general level we hope that this research will help provide a stronger empirical and theoretical link between psychological insights on voter attitudes and decisions, and how actual public policy is shaped by politicians. With the findings of study 1, we have reasons to believe that politicians have strong incentives to let the framing of public spending gravitate towards more vivid descriptions. Study 2 will highlight if politicians will have incentives to rely on both vividness and numerosity when designing public expenditure proposals.

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Appendix

Nye initiativer i aftalerne om finansloven for 2011

Mio. kr., 2011-priser	2011
Fornyet vækst i Danmark	**2.083**
Risikovillig kapitel – tabsramme til låne- og kautionsordninger	225
Pulje til nedrivning af boliger på landet	100
Forskning (globaliseringspuljen)	1.398
Handlingsplan for offensiv global markedsføring	105
Udmøntning af midler fra Fornyelsesfonden	255
Sundhed, forebyggelse samt svage grupper	**1.446**
Kræftplan III, herunder 42 nye hospicepladser	50
Genoptræning og rehabilitering mv.	36
Forebyggelse af fysisk og psykisk nedslidning på arbejdspladsen	350
Initiativer som led i satspuljeaftalen for 2011	484
Investeringer i Anvendt Borgernær Teknologi	374
Puljer til initiativer på social og sundhedsområdet mv.	153
Uddannelse	**1.024**
Flere unge i uddannelse	874
Læsefond til folkeskolen	150
Udlændinge- og retsområdet	**863**
Aftale om politiets og anklagemyndighedens økonomi i 2011	530
Indkvartering af asylansøgere	246
Ghettoerne tilbage til samfundet	45
Øvrige initiativer på udlændinge og retsområdet	42
Sund økonomi og nye initiativer	**1.098**
Bortfald af budgetregulering vedr. arbejdsgiverbidrag i 2011	250
En aktiv beskæftigelsesindsats	756
Øvrige udgifter, herunder miljø, kultur, beredskab mv.	92
I alt	**6.514**

Figure 8: Example of summary of budget law.

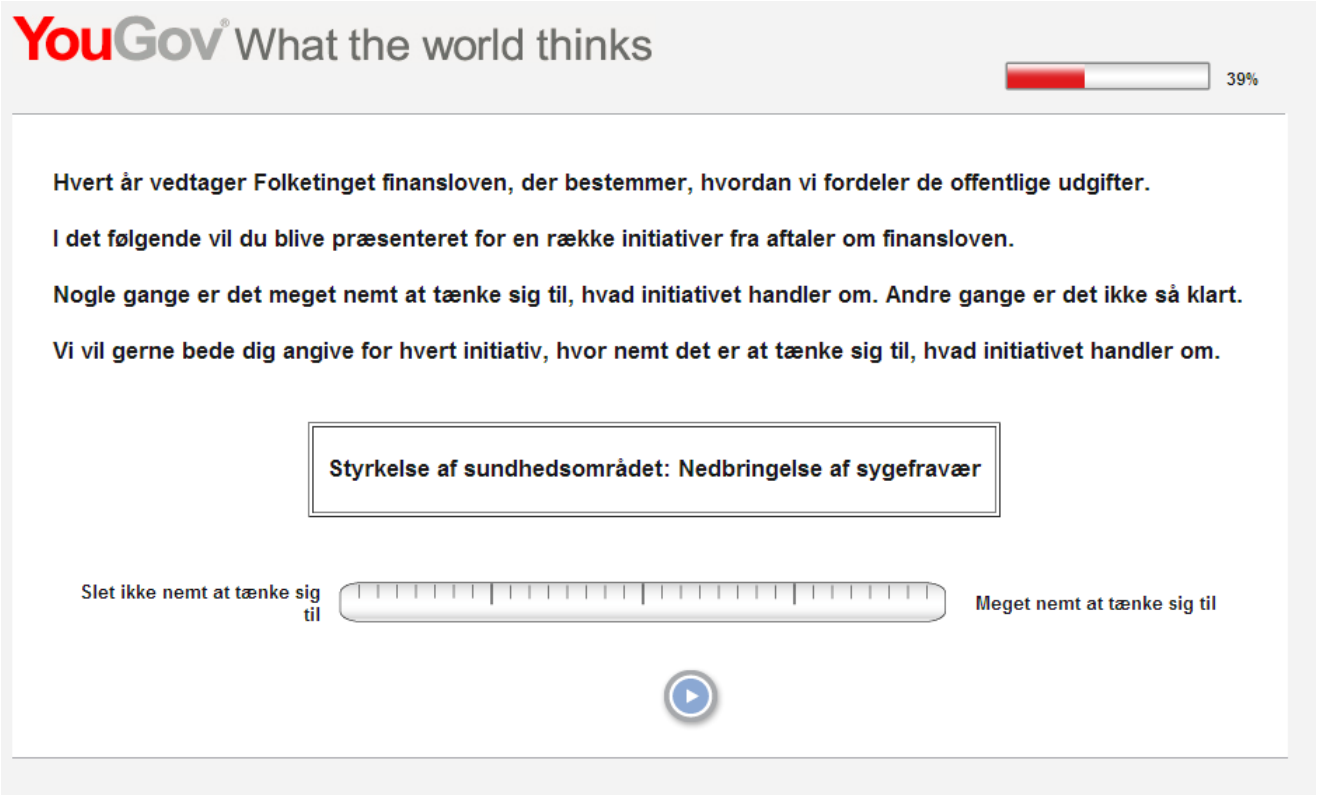

Figure 9: Example of survey screen seen by participants.