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Abstract

Policies that would create net benefits for society but would also involve costs frequently lack the necessary support to be enacted because losses loom larger than gains psychologically. To reduce this harmful consequence of *loss aversion*, we propose a new type of policy bundling technique in which related bills that have both costs and benefits are combined. Using a laboratory study, we confirm across a set of four legislative domains that this bundling technique increases support for bills that have both costs and benefits. We also demonstrate that this effect is due to changes in the psychology of decision making, rather than voters' willingness to compromise and support a bill they weakly oppose when that bill is bundled with one they strongly support.

Keywords: loss aversion; policy bundling; behavioral economics

Introduction

Citizens hope their elected representatives will pass legislation that creates net gains that outweigh net harms—in other words, legislation that has positive expected value for society. However, Nobel Prize-winning economist Joseph Stiglitz (1998) has noted that legislators often fail to pass such legislation, even when its net positive expected value is highly significant. Social scientists have pointed to the dysfunctional role of special-interest groups in contorting our political processes and contributing to sub-optimal outcomes (Baron, 1998), and several cognitive explanations for the failure to pass legislation with positive expected value have also been discussed (Baron, Bazerman, & Shonk, 2006). This paper highlights one cognitive barrier to passing legislation with positive expected value for society and proposes a solution.

The psychology and economics literature suggests that legislators face an uphill battle when proposing legislation that has both costs and benefits due to the power of *loss aversion*, a cognitive bias that has been found to cause individuals to dramatically overweight losses relative to gains (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992).

Prospect Theory posits that people judge outcomes based on a subjective value function, which decelerates in the domain of losses more quickly than it accelerates in the domain of gains (Kahneman & Tversky, 1979). This means that equivalent losses and gains impact judgments unevenly; specifically, losses loom larger than equivalent gains. People expect the pain of a loss to be greater than the pleasure of an equal-sized gain.

Evidence that individuals exhibit loss aversion comes from research in both laboratory and field settings (for a review, see Camerer, 2000). In the field, loss aversion has been used to explain why taxi drivers tend to work longer hours on low-wage, clear weather days and quit earlier on high-wage, rainy days (Camerer, Loewenstein, Babcock, & Thaler, 1997). The observed negative correlation between wages and hours worked poses an economic puzzle, as

the increase in hourly wages on rainy days should represent an opportunity to increase wealth, while the decrease in hourly wages on clear days should discourage long hours. However, Camerer and colleagues (1997) argue that cab drivers seem to determine their work hours by setting daily income targets and working as many hours as needed to reach their targets. Such behavior demonstrates the influence of loss aversion if drivers are assumed to set a one-day time horizon and avoid earning less than their daily income target even on low-wage days because they are averse to this "loss" relative to their expected earnings (Thaler, 1999).

Samuelson and Zeckhauser (1988) have also documented evidence of loss aversion in the field, specifically among academics at Harvard University when the school stopped enrolling its faculty members in a default health care plan and instead allowed faculty to choose their own plans. Older faculty members overwhelmingly chose to remain with their existing plan, while younger members' choices were varied. Samuelson and Zeckhauser argued that this was the result of loss aversion. According to the authors, older faculty members had become accustomed to the original default plan, and it became their reference point. Thus, they were reluctant to move away from this default because an equivalent loss would reduce their utility more than an equivalent gain would increase it. Because a strong reference point had been established by their previous default health care plan, older faculty members were unwilling to switch unless the possible benefits dramatically outweighed the possible costs, while new faculty experienced no such loss aversion.

One reason loss aversion occurs is due to narrow decision bracketing: people often only think about their current choice and its immediate results, rather than evaluating the net result of many such choices over time (Kahneman & Lovallo, 1993). For example, participants have reported a reluctance to enter a hypothetical lottery with a 50 percent chance of winning $2 million and a 50 percent chance of losing $1 million (Thaler, 1999). Loss aversion drives many

to avoid participating in such a lottery despite its positive expected value. But if faced with a hundred such lotteries, this reluctance disappears (Samuelson, 1963; Thaler, 1999). The expected gain from a hundred lotteries with positive expected value trumps the loss aversion one experiences when considering just one such lottery.

More recent work in the policy domain has examined how moving from narrow to broader bracketing affects the strength of emotional responses to potential new policies. Ritov and Baron (2009) compared the role of emotional reactions versus cognitive deliberation in the assessment of proposed policies. They found that when participants assessed multiple policies, they were more influenced by cognitive evaluations of policy importance and less reliant on their emotional responses than when they were only considering a single policy. This work suggests that broadening the context of a judgment could help people make better decisions.

Because losses loom larger than gains psychologically when policies are narrowly bracketed, policies that would create net benefits for society but would also involve costs may frequently be defeated. Policy makers would thus benefit from learning how to combat loss aversion and reduce its impact on the perception of legislation with both costs and benefits. To achieve this, we propose a specialized type of policy bundling.

Legislators frequently combine *unrelated* policies supported by different interest groups into a single bill to increase support for their legislation. For example, conservatives might add a consumer protection law to their proposed budget to garner liberal support. We propose a different type of bundling technique: one in which *related* bills are combined in a way that reduces the harmful effects of the tendency to irrationally overweight losses relative to gains. Our proposed policy bundling method combines one bill that has costs in Domain A (e.g., job losses in Town X) and benefits in Domain B (e.g., acres of forest preserved in Town X) with a matched bill that has the inverse structure: benefits in Domain A (e.g., job gains in Town Y) and

costs in Domain B (e.g., acres of forest lost in Town Y). Within each domain, costs of a specific type (e.g., job losses in Town X) in one bill must be offset by greater benefits of that type (e.g., job gains in Town Y) in the second bill (see Table 1). We propose that this particular type of policy bundling has the potential to prevent legislators from overweighting the losses associated with individual bills, leading them to instead focus on the net gains of the merged bills.

Method

To test the hypothesis that the type of policy bundling outlined above can reduce the harmful effects of loss aversion on voting decisions, we conducted a laboratory experiment. 168 participants were recruited to participate in an hour-long set of studies in a computer lab on a large university campus in the Northeastern United States in exchange for $15. Participants completed our study at a computer terminal and then participated in two other unrelated studies.

During our study, participants were presented with four different hypothetical pieces of legislation, each with a different cost-versus-benefit tradeoff. For example, one such cost-benefit tradeoff involved losing jobs and gaining acres of protected forest versus gaining jobs and losing acres of forest in a community. Each piece of legislation was either a single bill pertaining to an individual policy that had costs and benefits or a combined bill in which the costs and benefits of two separate bills summed to generate net benefits in two domains. For the example tradeoff highlighted above, participants were randomly assigned to view one of the following three bills:

- *Bill 1*: A law to establish new park areas in Community X where logging would be prohibited, costing the community 100 jobs but preserving 60,000 acres of forest;
- *Bill 2*: A law to eliminate a protected park area in Community Y, which would allow logging on 50,000 acres of previously protected forest, destroying that forest region but creating 125 new jobs;

- *Combined Bill*: A bundled bill presenting both the proposals in *Bill 1* and *Bill 2* above together as two components of a single piece of legislation.

The three other types of tradeoffs studied included (see Table 2):

(1) A tradeoff between reduced/(increased) hours of gridlock and more/(fewer) fender benders due to the absence/(presence) of a traffic light at a dangerous intersection.

(2) A tradeoff between more/(fewer) hours of scheduled brownouts and fewer/(more) pollution-related health complaints due to fewer/(more) power plants.

(3) A tradeoff between an increase/(reduction) in a city's capacity for children in its playgrounds and a decrease/(increase) in the number of disease-carrying rodents in the city attracted by the increased/(decreased) presence of playground spaces.[1]

After viewing the details of a given policy (see online supplement for study materials), participants were asked if they would vote for or against the bill in question. Participants who had voted for/(against) a bill were then asked how many hours they would want their legislator to devote to supporting/(opposing) the passage of the bill – a measure of the strength of their support for the legislation. Strength of support is tabulated as the number of hours a participant would want his or her legislator to spend supporting a bill's passage, with hours spent in opposition coded as negative numbers. This strength of support measure captures precisely how much an individual values a given outcome, following the traditional economic measure of "willingness to pay."

Results

As illustrated in Table 2, in each of the four policy domains studied, we find that support for a combined bill is significantly greater than support for either of its separate, component bills.

[1] Only 116 participants responded to tradeoffs involving gridlock vs. fender benders and playground capacity vs. rodents. The 52 participants who did not respond to these tradeoffs saw bills that were similar to these but which involved slightly different cost and benefit numbers such that support for both Bills 1 and 2 separately was overwhelming, eliminating the need for a Combined Bill to increase support.

For example, for the jobs/forestry policies described above, 83% of participants indicated they would vote for the *Combined Bill*, a significantly greater show of support than that achieved independently by either *Bill 1* (45%; $p < 0.01$) or *Bill 2* (54%; $p < 0.01$). These findings substantiate our contention that policy bundling may be an effective tool for policymakers hoping to pass legislation that is advantageous overall, but that contains obvious and unavoidable costs.

Further, by measuring the strength of support for each bill, we are able to determine whether this finding could be explained by voters favoring one policy in a bundle more strongly than they oppose the other, and thus voting to pass a joint bill when they would not support one of its component bills. If such compromise were responsible for our findings, strength of support in legislator hours for each combined bill should equal the net strength of support in hours for its component bills. We show, however, in every one of the four policy domains studied that policy bundling is not effective due to compromise. The average of number of hours a participant would want his or her legislator to devote to supporting two separate bills sums to significantly fewer hours than the average number of hours a participant would want his or her legislator to devote to supporting the combined bill (see Table 2).[2] For example, for the jobs/forestry policies described above, participants reported that, on average, they would want their legislator to spend a total of 24 hours working to support the passage of the *Combined Bill* – significantly more time, on average, than participants reported they would want their legislator to spend, in total, working to support *Bill 1* (-31 hours) and *Bill 2* (1 hour) (see Table 2).[3] We therefore conclude

[2] For all four types of tradeoffs, one-tailed linear hypothesis tests conducted following regressions to predict participants' strength of support for a bill in legislator hours with dummies for Bill 1, Bill 2 and the Combined Bill (constant suppressed) show that the sum of the coefficients on Bill 1 and Bill 2 is significantly less than the coefficient on the Combined Bill.

[3] Three other measures of strength of support for each bill were also collected, each involving a participant's willingness to commit his or her own resources to supporting or opposing a given piece of legislation (hours, dollars or miles walked). These three additional measures exhibit similar patterns to those presented in Table 2 pertaining

that our results are due to a psychological difference between the way people evaluate individual bills with salient costs versus the way they evaluate combined legislation in which the costs embedded in individual bills are overshadowed by their net benefits.

Discussion

We believe the policy bundling method discussed above has the potential to help citizens and legislators who are struggling to pass legislation with salient costs that are outweighed by important benefits. Single pieces of legislation often fail to gain the necessary support for enactment because they are narrowly bracketed, and thus legislators are unable to overcome loss aversion. We hope that by bundling policies using the method proposed in this paper, legislators may be better able to move beyond the irrational reluctance to support wise legislation that loss aversion can induce.

While the behavioral decision research literature has shown it is difficult to fully debias human judgment (see Milkman, Chugh & Bazerman, 2009 for a review), recent research suggests we can design decision-making contexts in ways that lead to wiser choices (Thaler & Sunstein, 2008). By using our bundling strategy, policymakers may be able to overcome the pitfalls of loss aversion and, in turn, affect more positive legislative change.

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to hours a participant would want his or her legislator to spend supporting or opposing a bill's passage, although nearly half of participants were unwilling to commit any of their own resources to supporting or opposing legislation, leading to a reduction in the sensitivity of these three measures (due to high variance in strength of support responses). Appendix Table A1 presents detailed statistics for all strength of support data collected.

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Tables

Table 1. Illustration of new policy bundling concept, where n, m > 0.

	Domain A	**Domain B**
Bill 1	Costs of Size X	Benefits of Size Y
Bill 2	Benefits of Size X + n	Costs of Size Y – m

Table 2. Study results. For each tradeoff, participants were randomly assigned to evaluate *Bill 1*, *Bill 2*, or a *Combined Bill*.

Tradeoff		**Bill 1**	**Bill 2**	**Combined Bill**
Jobs (due to logging) vs. Acres of Protected Forest (due to forest protection laws prohibiting logging)	**Bill Contents**	*-100 jobs, +60,000 acres*	*+125 jobs, -50,000 acres*	*Bill 1 and Bill 2*
	YES Votes	45%**	54%**	83%
	Support in Legislator Hours	-31	1	24**
Hours of Gridlock (due to traffic light) vs. Number of Fender Benders (due to dangerous intersection with no light)	**Bill Contents**	*-6,000 hours, +10 accidents*	*+4,000 hours, -15 accidents*	*Bill 1 and Bill 2*
	YES Votes	58%**	38%**	84%
	Support in Legislator Hours	-51	-8	31*
Hours of Scheduled Brownouts (due to power shortages) vs. Number of Pollution-Related Health Complaints (due to power plant operation)	**Bill Contents**	*-1,000 hours, + 10 health*	*+800 hours, -12 health*	*Bill 1 and Bill 2*
	YES Votes	41%**	23%**	66%
	Support in Legislator Hours	-10	-17	22**
City's Capacity for Children in Its Playgrounds vs. Number of Disease Carrying Rodents in the City (attracted by presence of playgrounds)	**Bill Contents**	*+250 kids, +250 rodents*	*-225 kids, -300 rodents*	*Bill 1 and Bill 2*
	YES Votes	37%**	76%†	89%
	Support in Legislator Hours	-38	15	26*

One-tailed two-sample proportion tests reveal that in each domain, the Combined Bill receives significantly more "YES" votes than either Bill 1 or Bill 2. Reported strength of support statistics are averages. One-tailed linear hypothesis tests following OLS regressions to predict participants' strength of support for a bill in legislator hours with dummies for Bill 1, Bill 2 and the Combined Bill (constant supressed) in each domain show that the sum of the coefficients on Bill 1 and Bill 2 is always significantly less than the coefficient on the Combined Bill. N=168 for Jobs vs. Acres and Brownouts vs. Health Complaints; N = 116 for Gridlock vs. Accidents and Playgrounds vs. Rodents.

†Significant at 10% level. *Significant at 5% level. **Significant at the 1% level.

Appendix

Questions Asked of Participants about Each Bill after They Read Its Contents

- Do you support this bill?
  __ YES __ NO

[PAGE BREAK]

- How many dollars would you be willing to donate to support[4] the passage of this bill?:
  _____ dollars

- How many hours would you be willing to spend making phone calls to support[4] the passage of this bill?:
  _____ hours

- How many miles would you be willing to walk in a walkathon to support[4] the passage of this bill?:
  _____ miles

- If you were a member of community X, how many hours of his/her time would you want your local representative to devote to supporting[4] the passage of this bill?:
  _____ hours

Table A1. Summary of strength of support responses for *Bill 1*, *Bill 2* and *Combined Bill*.

[4] If participant selected "yes" in response to the question - "Do you support this bill?", this read "support" and otherwise, this read "oppose".

Tradeoff		Bill 1	Bill 2	Combined Bill
Jobs (due to logging) vs. Acres of Protected Forest (due to forest protection laws prohibiting logging)	**Bill Contents**	*-100 jobs, +60,000 acres*	*+125 jobs, -50,000 acres*	*Bill 1 and Bill 2*
	Support in Legislator Hours	-31 (10)	1 (9)	24** (10)
	Support in Donation Dollars	-84,158 (47,821)	6,792 (43,954)	-18,490 (45,553)
	Support in Hours Fundraising	-7 (3)	-3 (3)	3** (3)
	Support in Walkathon Miles	-194 (107)	1 (97)	4 (105)
Hours of Gridlock (due to traffic light) vs. Number of Fender Benders (due to dangerous intersection with no light)	**Bill Contents**	*-6,000 hours, +10 accidents*	*+4,000 hours, -15 accidents*	*Bill 1 and Bill 2*
	Support in Legislator Hours	-51 (31)	-8 (31)	31* (32)
	Support in Donation Dollars	-390 (1,529)	-8 (1,569)	2,843 (1,591)
	Support in Hours Fundraising	-11 (7)	-2 (7)	14* (7)
	Support in Walkathon Miles	-1 (12)	-22 (12)	4 (12)
Hours of Scheduled Brownouts (due to power shortages) vs. Number of Pollution-Related Health Complaints (due to power plant operation)	**Bill Contents**	*-1,000 hours, + 10 health*	*+800 hours, -12 health*	*Bill 1 and Bill 2*
	Support in Legislator Hours	-10 (10)	-17 (11)	22** (11)
	Support in Donation Dollars	-241 (9,714)	-1,082 (11,336)	-18,167 (10,479)
	Support in Hours Fundraising	-4 (2)	-2 (2)	0* (2)
	Support in Walkathon Miles	-4 (10)	-2 (11)	18 (10)
City's Capacity for Children in Its Playgrounds vs. Number of Disease Carrying Rodents in the City (attracted by presence of playground spaces)	**Bill Contents**	*+250 kids, +250 rodents*	*-225 kids, -300 rodents*	*Bill 1 and Bill 2*
	Support in Legislator Hours	-38 (16)	15 (17)	26* (15)
	Support in Donation Dollars	-12 (1,591)	-2,974 (1,662)	376 (1,456)
	Support in Hours Fundraising	-22 (13)	6 (13)	-1 (12)
	Support in Walkathon Miles	-55 (30)	4 (32)	4 (28)

Reported strength of support statistics are averages. One-tailed linear hypothesis tests following OLS regressions to predict participants' strength of support for a bill in legislator hours with dummies for Bill 1, Bill 2 and the Combined Bill (constant supressed) in each domain show that the sum of the coefficients on Bill 1 and Bill 2 is always significantly less than the coefficient on the Combined Bill. Standard errors from OLS regressions are in parentheses.

†Significant at 10% level. *Significant at 5% level. **Significant at the 1% level.

Supporting Online Materials

The wording of each bill presented to participants for each of the four tradeoffs studied:

Tradeoff 1

About Community X:

Community X is situated in the middle of the National Forest.
Community X has high overall unemployment.
Community X employs many individuals in the foresting industry.
The average yearly wage of loggers in community X is $41,000.

About the National Forest:

The National Forest encompasses 1,000,000 acres.
One square mile is equal to 640 acres.
600,000 acres of the National Forest are currently leased to logging firms.

[Bills 1 and 2]

This Bill:

Within the eastern part of the National Forest, there is a [*B1*: 60,000]/[*B2*: 50,000] acre parcel of land that has been logged over the last 125 years and is currently [*B1*: leased to a private timber firm. The lease]/[*B2*: protected from logging. The land's protected status] expires this year. This bill would not renew the [*B1*: lease]/[*B2*: protected status], and would [*B1*: protect the parcel of land from further harvesting]/[*B2*: permit leasing of this parcel of land for logging]. This would result in the [*B1*: loss of 100]/[*B2*: creation of 125] jobs for the foreseeable future in Community X.

Change in Community X Jobs	Change in Protected Acres
[*B1*: 100 Jobs LOST]/ [*B2*: 125 Jobs Gained]	[*B1*: 60,000 Acres GAINED]/ [*B2*: 50,000 Acres LOST]

[Combined Bill]

This bill has two parts:

PART A. [Text of *Bill 1* from above].

PART B. [Text of *Bill 2* from above].

Bill	Change in Community X Jobs	Change in Protected Acres
A	100 Jobs LOST	60,000 Acres GAINED
B	125 Jobs GAINED	50,000 Acres LOST

Tradeoff 2

About the State Highway:

One 5-mile stretch of the State Highway near downtown is known for its frequent accidents, with an average of 100 fender-benders per year.

Traffic lights on highways reduce the number of fender-benders, but increase the amount of time commuters must spend to travel the same distance.

[Bills 1 and 2]

The State Legislature is considering the following bill.

This bill would [*B1*: remove]/[*B2*: add] a traffic light [*B1*: from]/[*B2*: to] a specific section of the 5-mile stretch of State Highway. This would [*B1*: reduce]/[*B2*: increase] the total amount of time spent on the 5-mile stretch by all drivers combined over the course of a year by a total of [*B1*: 6,000]/[*B2*: 4,000] hours. However, it would result in [*B1*: 10 more]/[*B2*: 15 fewer] fender-benders per year on the State Highway.

Change in Gridlock hours	Change in Fender-Benders
[*B1*: 6,000 Hours LESS TRAFFIC] [*B2*: 4,000 Hours MORE TRAFFIC]	[*B1*: 10 MORE [*B2*: 15 FEWER]

[Combined Bill]

The State Legislature is considering the following bill. This bill has two parts:

PART A. [Text of *Bill 1* from above].

PART B. [Text of *Bill 2* from above].

Bill	Change in Gridlock hours	Change in Fender-Benders
A	6,000 Hours LESS TRAFFIC	10 MORE
B	4,000 Hours MORE TRAFFIC	15 FEWER

Tradeoff 3

About State X:

State X is a suburban community in the United States.

State X has energy plants that generate enough power to meet the energy needs of its residents and businesses, with occasional shortages. When shortages arise, the power companies announce pre-planned blackouts. During these pre-planned blackouts, electricity is shut off for a pre-scheduled period of time in pre-determined areas.

The State Legislature is considering the following bill:

[Bill 1]

This bill would lead to the construction of a new energy plant in Town A within State X. This will reduce power shortages and reduce the number of pre-planned blackouts. The new energy plant will reduce the number of blackout hours in Town A by 1,000 hours every year. However, the new plant will increase the amount of pollution in Town A. It is expected that 10 more pollution-related health complaints will be filed annually as a result of the construction of a new plant.

Change in Total Hours of Pre-planned Blackouts	Change in Pollution-Related Health Complaints
1,000 FEWER Hours	10 MORE Filed Complaints

[*Bill 2*]

This bill would lead to the closure of one of the existing energy plants in Town B within State X. This will reduce the amount of pollution in Town B, and it is expected that 12 fewer pollution-related health complaints will be filed annually. However, shutting down an energy plant will increase the number of pre-planned blackouts. This will result in an expected increase of 800 more hours of pre-planned blackouts every year.

Change in Total Hours of Pre-planned Blackouts	Change in Pollution-Related Health Complaints
800 MORE Hours	12 MORE Filed Complaints

[Combined Bill]

The State Legislature is considering the following bill. This bill has two parts:

PART A. [Text of *Bill 1* from above].

PART B. [Text of *Bill 2* from above].

Bill	Change in Total Hours of Pre-planned Blackouts	Change in Pollution-Related Health Complaints
A	1,000 FEWER Hours	10 MORE Filed Complaints
B	800 MORE Hours	12 MORE Filed Complaints

Tradeoff 4

About City Y:

City Y is a densely populated metropolitan community in the United States

[Bills 1 and 2]

The Municipal Legislature is considering the following bill:

This bill proposes renovating the current downtown by [*B1*: adding a new]/[*B2*: removing an existing] playground with the capacity for [*B1*: 250]/[*B2*: 225] children. [*B1*: However,] it has been carefully determined that [*B1*: building a new playground in the designated area]/[*B2*: removing this particular playground] is likely to [*B1*: increase]/[*B2*: reduce] the population of disease-carrying rodents in the city by [*B1*: 250]/[*B2*: 300].

Change in City's Playground Capacity	Change in City's Disease-Carrying Rodent Population
[*B1*: Capacity for 250 MORE Children]/ [*B2*: Capacity for 225 FEWER Children]	[*B1*: 250 MORE Disease-Carrying Rodents]/ [*B2*: 300 FEWER Disease-Carrying Rodents]

[Combined Bill]

The Municipal Legislature is considering the following bill. This bill has two parts:

PART A. [Exact text of *Bill 1* from above].

PART B. [Exact text of *Bill 2* from above].

Bill	Change in City's Playground Capacity	Change in City's Disease-Carrying Rodent Population
A	Capacity for 250 MORE Children	250 MORE Disease-Carrying Rodents
B	Capacity for 225 FEWER Children	300 FEWER Disease-Carrying Rodents