Framing and Taxation: Evaluation of Tax Policies Involving Household Composition

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USC Olin Research Paper No. 00-18 (REVISED)

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University of Southern California Law School
Los Angeles, CA 90089-0071

Framing and Taxation: Evaluation of Tax Policies Involving Household Composition

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June 10, 2003

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‡ Both authors thank the USC-Caltech Center for the Study of Law & Politics for financial support; participants at workshops at USC Law School; the Wharton School, University of Pennsylvania; Washington University; and UCLA for helpful comments on earlier versions of this article; Robert Pollak and Dan Simon for helpful conversations; and Joan Huh and Tim Lan for excellent research assistance.

Abstract

Three studies of attitudes toward tax policies were conducted on the World Wide Web. The results show several effects. In *penalty aversion*, subjects preferred bonuses over penalties, when policies differ only in how they are formally described. In the *Schelling effect*, subjects prefer both higher bonuses (for children) for the poor than for the rich and higher penalties (for being childless) for the rich than for the poor. In the *neutrality bias*, subjects preferred separate filing for married couples more when it was presented in a format that emphasized the effect of marriage (where it is neutral) than in one that emphasized the effect of the number of earners in a couple (where one-earner couples pay more). In the *status-quo effect*, subjects preferred the specified starting point to any change. Finally, in the *metric effect*, subjects favored more progressiveness in tax burdens when taxes were expressed in percent than when they were expressed in dollars.

The research suggests a general framework. Subjects approach a given decision problem with strong independent norms or ideals, such as, here, "do no harm," "avoid penalties," "treat likes alike," "help children," and "expect the rich to pay more." They then evaluate the problem on the basis of the most salient norms. In a complex area such as tax, independently attractive ideals are often in conflict, and the result is shifting, inconsistent preferences.

1 Introduction

One of the most enduring findings of the cognitive psychology literature is that subjects can be influenced by the "framing" or purely formal presentation of choices (Kahneman and Tversky 1979; Tversky and Kahneman 1981 and 1986; Thaler 1999). In the decades since Kahneman and Tversky's pioneering work on prospect theory and (*inter alia*) framing, researchers have both confirmed and extended the insights, and attempted to apply them to domains other than those involving specifically risky choices, where the subject first developed. Levin, Schneider and Gaeth 1998, and Levin et al. 2002, for example, have begun to develop a helpful typology of framing effects, classifying the field as "risky outcome," "attribute," and "goal" frames. Meantime, a parallel literature has begun to discuss the significance of framing in political contexts (Druckman, 2001), with an emphasis on institutions and devices that might lesson the effects of framing-induced or related biases on judgments.

Tax is clearly an important domain for economic psychology (Lewis 1978). What citizens think of the fairness of tax systems can affect compliance with that system and the willingness to support, or not, political change of it (Cuccia and Carnes 2001; Christensen, Weihrich, and Newman 1994; White, Curatola and Samson 1990). There have been some studies of the role of framing and other cognitive heuristics and biases in perceptions of tax (Kinsey, Grasmick and Smith, 1991; Sheffrin, 1993 and 1994; McCaffery, 1994). Still, most of the research that has been conducted on popular attitudes towards fairness in tax has drawn on survey questions that take the status quo for granted and focus on general, one-dimensional aspects of tax system design, such as the appropriate level of marginal tax rate progression (but see Hite & Roberts, 1991; Roberts, 1994; Hite & Stock 1996 for

examples of different approaches). Yet most of the decisions reflected in actual tax systems are specific and multi-dimensional. These complex real-world issues raise questions about the interactions of different possible frames making salient conflicting goals affected by tax law features.

In the experiments that follow, we attempt to get a more detailed and nuanced perspective on perceptions of fairness in tax with respect to aspects of tax-law design. In particular, we consider legal settings relating to marriage and children, which have become salient in the United States due to public political discussion of the "marriage penalty" in tax (Berliant and Rothstein, forthcoming; Alms et al 1999). Especially when set against the backdrop of progressive marginal rates, long a feature of taxes in the United States and one generally supported by popular perception (Hite and Roberts 1991), these issues of household composition and tax generate conflicts among independently attractive goals, such as avoiding "penalties" and maintaining "neutrality" among affected parties. Preference reversals elicited by framing manipulations can be exacerbated by progressive rates, which in turn can be made to appear more or less progressive based on the formal mode of presentation, as in dollars or percent (compare Heath, Chatterjee and France 1995; Thaler 1999).

2 Theory and hypothesis development

Our research concerns the interaction of several different types and instances of types of frames, on the one hand, with tax-law policies that involve the collision of independently attractive goals, on the other hand. Some background on both framing and tax is needed to understand our hypotheses.

2.1 Framing effects

A “frame” refers to a purely rhetorical characterization of an underlying constant factual reality. That the purely formal framing of a situation has effects on individual choice or evaluation violates a principle fundamental to rational choice, that of preference invariance. Framing effects thus raise concerns across a wide range of individual and public political choice settings. If the wording of a decision problem matters, how can we tell what people’s “true” preferences are? Who sets the frames? How stable are they?

Given the stakes, it is not surprising that researchers have attempted to bring greater structure and coherence to the subject matter. Of late, this has taken a turn towards the attempt to classify frames by their analytic structures. In a helpful typology being developed by Levin, Schneider and Gaeth 1998, most of the earliest frames, as famously developed by Kahneman and Tversky, involve *risky choice outcomes*. The classic example is the so-called Asian Disease problem. Subjects are given a choice of two vaccines or cures. One will save some lives with certainty; the other might save all lives with some uncertainty. In the characteristic finding of the framing literature, subjects undergo a preference reversal: they prefer the sure thing in a “positive” frame, when the certain saved lives are emphasized, but prefer the risky alternative — on the same underlying facts — when the certain deaths are emphasized. The characteristics of the risky choice frame are choice — the subject is choosing between options — and risk.

Attribute framing refers to emphasizing a positive or negative aspect of an item under consideration. Canonical examples include emphasizing the chances of success versus those of failure for a particular venture, or the percentage lean or fat in meat (for example 75% lean versus 25% fat). Here the subject is asked to rate the attractiveness of the item or

proposal on a scale; there is no choice, and no risk.

Finally, *goal framing*, which according to Levin and colleagues affects the "persuasiveness of communication," emphasizes the potential to obtain a gain (positive frame) versus the potential to avoid a loss (negative frame). Again in a now fairly canonical example, subjects are asked about breast self-examinations in one of two ways: one way states that self-examination leads to increase chance of finding a tumor early, the other that failure to self-examine leads to a decreased chance of early detection.

Levin, Schnieder and Gaeth (1998), summarizing decades of literature, found that all three types of framing have fairly consistent effects, leading to *preference reversals*, where subjects actually change their choices in alternative frames (or the rank order of evaluations), and *preference shifts*, where intensities of preferences change with the frame. In subsequent research, however, Levin and colleagues found that risky choice and attribute framing may have more enduring, significant effects than goal framing (Levin et al 2002).

Druckman (2001) who, like us, is explicitly concerned with the role of framing in contexts where citizens form opinions about matters of public political importance, uses a different typology. He distinquishes between *equivalency* and *emphasis* framing. In the former, the precise situation is described in alternative ways, such as a glass being half-full or half-empty. Druckman finds that preference reversals due to equivalency frames do indeed bespeak "citizen incompetence." Emphasis framing, in contrast, draws attention to different aspects of the choice problem, such as pointing to the potential harmful consequences of a particular exercise of free speech as opposed to stressing the importance of the right itself. Druckman, while worried about "elite manipulation" when it comes to emphasis framing, does not necessarily see it as leading to "citizen incompetence."

The research that we present does and does not track this emergent literature. In the

language of Levin and colleagues, our research concerns mainly attribute framing. But we show that this category includes a rich set of possibilities. We ask about the fairness of various tax-law features or proposals, and our frames draw attention to different aspects of these settings. Often our problems involve choice, though not risky choice; other times they involve the evaluation of the fairness of various options. A — realistic — difference from the classic framing settings, such as the Asian disease problem, is that our frames, in the tax setting, draw attention to harms or benefits to *distinct* groups. Thus, a "child bonus," *ceteris paribus*, appears to help parents, while a "childless penalty" appears to hurt non-parents. This example also shows how we straddle Druckman's typology: the child bonus / childless penalty manipulation is *both* an equivalency frame *and* an emphasis one. A child bonus is a childless penalty, after all, and yet the different characterization emphasizes different groups affected by the same policy.

This discussion suggests our own approach to framing. We suspect that the effects of frames are not so much to be found in the analytic distinctions among types of frames as in the habits of thinking and deciding within the individual subjects confronting the frames. Different frames, focusing on different attributes of tax-law design, bring various independently attractive goals into conflict. We hypothesize that subjects will bring various ideas and intuitions into their consideration of admittedly complex tax-law features: they desire to be "fair" and "neutral;" to avoid "penalties;" and to maintain some degree of progressivity, with the rich paying more of their income than the middle classes, and the middle classes paying more than the poor. Trouble is, these desires can be inconsistent in tax, as we shall see. Faced with inconsistency, we hypothesize that subjects will tend to focus on the particular principle most evident in the formal presentation before them, ignoring the others (compare McCaffery and Baron, forthcoming).

2.2 Factual and legal settings

Some understanding of modern tax-law systems is needed to see the conflict among goals at the core of our framing manipulations. Three features are in play in our experiments: progressive marginal rates; the accommodation (or not) of marriage; and the accommodation (or not) of children in a household.

2.2.1 Progressive marginal rates

The United States income tax works through a system of progressive marginal rates. Precise rate brackets are individualized somewhat through a variable "zero bracket" or exemption level that depends on household composition and the presence or absence of various possible "itemized" deductions. For a single person in the year 2002, for example, the 0 bracket was approximately $10,000; income from $10,000 to $35,000 was taxed at a 15% marginal rate; from $35,000 to $75,000 at a 28% rate, and so on, up to a maximum 38.6% rate on income in excess of $300,000.

This pattern of progressive marginal rate brackets generates much common confusion, typically in the mistaking of marginal for average (or effective) tax rates. The latter, obtained simply by dividing total tax by total income, will by design be lower than the marginal rates for all non-zero rate brackets. Progressive marginal rates also put pressure on the choice of taxpaying unit and the accommodation, or not, of children and other dependents, the subject matter of our experimentation. Many of these confusions and complexities would dissipate in a system with progressive average or (equivalently) effective tax rates, achieved by a linear tax rate schedule coupled with a lump-sum transfer (Berliant and Rothstein, forthcoming). But following actual tax practice in the United States and all

other developed nations, our examples feature progressivity effected by means of progressive marginal tax rates.

2.2.2 The marriage penalty

A tax system that relies on individual reporting must make decisions about the taxpayer unit: should filing be done on a per individual, couple, family, or other basis? Once a system has decided to have progressive marginal rates, as the American and most comprehensive income taxes around the world now do, it faces further difficulties. In general, it is impossible to combine progressivity with two other goals: "marriage neutrality," meaning that the taxes of a couple are unaffected by their decision to marry or, equivalently, that the system has neither marriage "bonuses" nor "penalties" in it, and "couples neutrality," that is, the norm of taxing all households with the same monetary income equally.[1]

It is easy enough to understand the problem. Consider a simple tax system with a $10,000 per person zero bracket or exemption level and a flat 20% tax rate above that. (Note, in passing, that this example illustrates that such a "flat" tax is in fact a two-rate, progressive marginal, tax system.) If the brackets simply doubled for married persons, then a couple where one partner earns $20,000 and the other $0 will get a marriage bonus on marrying: their taxes will fall from $2,000 to $0. In contrast, if the same brackets unadjusted for marriage applied to couples filing jointly, then a couple where each partner

[1] We use the term "monetary" income to distinguish from a broader conception that would include imputed income; most couples with a stay-at-home spouse can be expected to have more of the latter, in the form of self-supplied household labor and services. Cash or monetary income has been especially salient in historic discussions of the taxation of households, however, an effect we intend to examine in subsequent studies.

earned $10,000 would pay a marriage penalty after their wedding: their taxes would rise from $0 to $2,000. If the law made no adjustment whatsoever for marriage, then the two married couple households, each making $20,000, would have different tax burdens: the one-earners would pay $2,000, the two-earners $0.

The current American tax system achieves a compromise between marriage penalties and bonuses by setting all but the highest rate bracket for married persons filing jointly at 1.6 times the single persons' brackets (that is, in our running simplified example, at $16,000 for the 0 bracket, and so on).[2] Married persons filing separately pay tax under a schedule set at one-half the married persons filing jointly one. This means that such couples only get .8 of the single persons' brackets. This option is thus rarely beneficial and is in fact rarely used.

The law's compromise upholds the goal of couples' neutrality, taxing equal-earning households equally, but at the cost of marriage neutrality. Most two-earner couples, about 50% of all married ones, pay marriage penalties (because, in our running example, their combined zero bracket declines from $20,000 to $16,000); most predominantly one-earner couples, about 40% of all married taxpayers, receive a marriage bonus (because, again in the running example, their effective zero bracket has increased from $10,000 to $16,000). This system has been criticized as being biased against working wives, because the compelled aggregation of spouses creates a bias against a second monetary income earner, who is typically the wife (McCaffery, 1997). In the last several years, there have been prominent proposals before the U.S. Congress and elsewhere to change the situation by reducing or eliminating marriage penalties.

[2] See Internal Revenue Code Section 1(a), (c), and (d).

2.2.3 Child deductions or credits

As with accounting for marriage or not, a comprehensive personal income tax system must decide how if at all to accommodate for the presence of children in a household. The resolution of this issue under American law is characteristically complex. The income tax treats minor children, with some exceptions and qualifications, as separate taxpayers for purposes of earning their own income, but also allows deductions to the parent(s) for purposes of adjusting the family's tax brackets.[3] The amount of the so-called dependency deduction is indexed for inflation and is currently approximately $3,000. A family's zero bracket or effectively tax-exempt range thus increases by $3,000 per child. Given progressive marginal rates, these deductions are worth more in effective tax savings to a high-income/high-bracket family than to a low-income/low-bracket one. A family in the 15% bracket will save $450 in taxes per each child, for example, whereas a family in the 30% bracket will save twice as much — although, to further complicate matters, the benefits of personal exemptions under American law are currently phased-down over certain income ranges.

2.3 The Schelling effect

To illustrate the potential collision among features of tax-law design embodying commitments, consider the classroom demonstration attributed to Schelling (1981). Schelling had asked his students to evaluate a tax policy that would allow a larger child deduction to the rich than to the poor, to which the students predictably objected. Schelling then pointed out that the bonus for having a child presumed a childless default rule; if the default were

[3] See Internal Revenue Code Sections 151, 152.

set for a couple with children, penalties would have to be imposed for childless households. The parallel question then became whether the surcharge for poor childless households should be as large as it is for rich ones. Students predictably reversed their preference with the altered presentation, objecting to an equally large surcharge on lower-income households.

The Schelling discussion illustrates what we call *penalty aversion*: the sensitivity of evaluation to the perception of "benefits" versus "burdens" (McCaffery, 1999). As with all of the framing manipulations we tested, there is also ample evidence in the popular political culture of parties drawing attention to one perspective or another in discussing and debating tax; for a recent prominent example of complaints against "childless penalties," see Burkett (2000).

We tested directly the effect of a framing manipulation using both a child bonus or surcharge and a marriage bonus or surcharge, using "surcharge" as a less normatively-charged term than "penalty." Traub (1999) investigated similar framing effects in a questionnaire study of 219 employees of German firms. Traub found support for what he called an "endowment effect" — subjects preferred bonuses to surcharges, what we call penalty aversion — and a self-serving bias that his between-subject design allowed him to test. Traub rejected, however, the Schelling hypothesis.

2.4 Hypotheses

Consistent with the well-established findings of attribute framing (Levin, Schnieder and Gaeth 1998), we expected to find preference reversals and shifts in attitudes towards tax law fairness based on various framing manipulations. Given the high costs of obtaining knowledge about technical features of tax law design, and the low benefits to individual

citizens from having well-formed, consistent judgments across frames, we did not expect subjects to have particularized knowledge and attitudes about tax (Druckman 2001; Christensen, Weihrich and Newman 1994). Instead, we expected subjects to import into the consideration of tax-law design various independently attractive principles. When framing manipulations drew attention to one rather than another of these principles, we expected shifts and reversals; when two or more principles were in play, as in the Schelling effect, we expected the shifts to be exacerbated.

More specifically, we expected subjects to want to follow a general principle of neutrality, as by treating like taxpayers alike. But in the complexity of tax, it is possible to make different comparisons and thus to uphold, or deny, different neutralities. The principal example is that the norms of couples neutrality (treat all equal-earning couples alike) and marriage neutrality (treat married and unmarried couples of the same income level alike) are inconsistent under progressive marginal rates. We expected that frames emphasizing neutralities would receive positive evaluations compared to frames emphasizing non-neutralities. We call this a *neutrality bias.*

Second, consistent with much of the framing lietarture (for example, Thaler 1999), we expected to see *penalty aversion*, reflecting a principle to "do no harm" (Baron 1998). But again the trouble is that any policy characterized as a "bonus" can be equally well characterized, in a purely formal way, as a "penalty" to the excluded parties. This is an example of what Druckman (2001) calls an equivalency frame. In line with Thaler's (1980) real world observation that people will use credit cards and forego a "benefit" for paying in cash (e.g. $2.00 versus $1.90 per gallon), but will switch to cash to avoid a "penalty" on credit cards (e.g. $1.90 versus $2.00), we anticipated that subjects would prefer policies described with reference to bonuses over the same policies presented as penalties. This

frame is common in tax: child bonuses are child-less penalties, marriage penalties are singles bonuses, and so forth. Note that this effect is conceptually distinct from a status quo bias, because there need be no *change* from a baseline at all: the same policy can simply be described with reference to its punitive converse.

We also expected subjects to react differently to the presentation of progressive marginal rates, depending whether the values were given in dollars or percent, marginal or average, per person or per couple, and so on, in what we call a metric effect (McCaffery and Baron, forthcoming; compare Lewis 1978; Hite & Roberts 1991; Roberts et al. 1994; Roberts & Hite 1994). Once again, this illustrates the general tendency of seeking to follow an independently attractive principle in a complex, no doubt unfamiliar area. Specifically, we expected subjects to react to certain salient patterns without using basic math to convert into other metrics: a flat *percentage* tax appears progressive when stated in dollars, because higher incomes pay higher taxes. An independent principle of "making the rich bear their fair share" will cash out differently depending on the metric of the choice set.

Importantly, we expected interactions with progressivity and other biases, such as penalty aversion. That is, we expected subjects to be more averse to penalties but more supportive of bonuses at lower income levels, for example, as in the Schelling effect.

Finally, and in line with standard cognitive psychology findings (Baron, 2000; Samuelson & Zeckhauser, 1988; Baron & Jurney, 1993), we expected subjects to weigh losses in moving away from a specified baseline more heavily than gains, and thus to show a resistance to change, all else equal. We believed, however, that this effect would be smaller than the others, because the principle of "effect no change" is unlikely to be as compelling as those of "treat likes alike," "do no harm," "help children," or "expect the rich to pay their fair share."

3 Experimental method

In each of the experiments we describe, subjects completed a questionnaire on the World Wide Web. The Web-based experimentation allowed us to model complex real-world situations with accuracy and to tailor questionnaires for sophisticated within-subject testing: to allow a subject's answers to one part to set the frame for a second part, for example (as in Experiment 3). The subjects found the questionnaire because of previous postings to newsgroups for other studies and links from various frequently visited Web pages. Subjects were paid $3 and had to provide their name, address, and social security number (if they lived in the United States) in order to receive pay. The questionnaires were run by a JavaScript program, which checked to see that all responses were complete and in the required range.

Each experiment began with an introductory page, which we have reproduced in an appendix. These pages gave detailed explanations of the factual and legal contexts for the experiment, as well as some motivation for the principles. Subjects were then presented with a series of screens, typically 32, in which they had to answer specific questions and / or supply specific values, generally involving comparisons of tax systems. Subjects had to complete each screen to move on to the next screen. The order of the screens was randomized across subjects. The material was undeniably complex, but we can infer subject sensitivity by the time it took them to complete the questionnaires: means and medians of 21 / 18, 15 / 11, and 27 / 23 minutes for Experiments 1 through 3, respectively. In addition, we can deduce from patterns of responses in particular experiments that the subjects in fact understood what they were being asked and took care to follow particular instructions.

Our method of sampling is unable to characterize any particular population of interest.

The subjects may be untypical of United States taxpayers, for example, because of the facts that they found and completed the experiments on the Web, and most of them did the studies for small amounts of money. In the present studies, we did not collect data relevant to the question of whether particular demographic characteristics of the subjects, including their actual or perceived self-interest, drove the results. Note, however, that, consistent with the general framing effect literature, we were testing for within-subject effects: the very same subjects answered inconsistently based on our purely formal manipulations. Further in terms of the external validity of our research, it is worth noting that our findings are consistent not only with well-established literature in other domains (Levin, Schneider and Gaeth 1998), but also with the actual shape of United States tax law (Alm et al., 1999; McCaffery 1997).

4 Experiments

4.1 Experiment 1

Our first experiment directly tested for penalty aversion and the Schelling effect. We asked about bonuses and penalties, for children and marriage, against a background of progressive marginal rates. We expected the bonus / penalty characterization to matter, and for the resulting preference reversals or shifts to be exacerbated at higher marginal tax rates.

4.1.1 Method

Forty-nine subjects completed the questionnaire on the World Wide Web. Ages ranged from 16 to 59 (median 30). The subjects were 29% males and 14% students.

Subjects saw a questionnaire titled “Taxes,” reproduced in the appendix, explaining

the idea of marriage penalties and bonuses and describing what was to be asked in the screens.

A typical screen appeared as follows:

> A married couple with one income of $25,000 pays $3,000 in taxes. The same income earner, if not married, would pay a surcharge of $2,000.
>
> A married couple with one income of $100,000 pays $30,000 in taxes. The same income earner, if not married, would pay a surcharge of $6,000.

How fair is the allocation of the surcharge to high and low income taxpayers?	How fair is this surcharge on the whole?
Much too much for high income, much too little for low	As fair as possible
Too much for high, too little for low	Very fair
A little too much for high, a little too little for low	Somewhat fair
A little too much for low, a little too little for high	Somewhat unfair
Too much for low, too little for high	Very unfair
Much too much for low income, much too lit-tle for high	As unfair as possible

The subject had to click on one of the answers in each column and then click another button at the bottom to continue. All screens presented a low-earner couple, making $25,000, and a high-earner one, making $100,000. Half of the items involved surcharges,

half bonuses. When the item involved a surcharge, the base tax was always $3,000 for the low earners and $30,000 for the high earners. The surcharge on the low earners was $1,000 in half of the cases and $2,000 in the other half. The surcharge on the high earners was either $3,000 or $6,000. Each of the two low-earner amounts occurred with each of the two high-earner amounts, in half of the cases, for four permutations.

When the item was stated as a bonus, what would otherwise be the surcharge was added to the base tax, so that the bonus reduced the tax to the base amount. Thus, for the surcharge item in which the base tax was $3,000 for low earners and the surcharge was $1,000, the corresponding bonus item would be stated as a tax of $4,000 and a bonus of $1,000. Subjects therefore judged the same bottom-line taxes as bonus and as surcharge items (in an equivalency frame), four times each.

We used 8 conditions, illustrated as follows for the low income couple with $1,000 low-earner surcharge or bonus. Each condition was presented with the four permutations of high and low surcharge/bonus, for the total of 32 screens, presented to each subject in a different random order. Note that the 8 conditions fall into four pairs of economically identical tax schemes: a marriage surcharge paired up with a single bonus, and so on. The names of each item type were not shown to the subjects.

Marriage surcharge: Two single people with incomes of $12,500 each pay $3,000 in taxes, together.

Married people with the same total income ($25,000) pay a surcharge of $1,000.

Single bonus: A married couple with two incomes of $12,500 ($25,000 total) pays $4,000 in taxes, as a couple.

Two single people with the same incomes ($12,500 each) get a bonus of $1,000.

Single surcharge: A married couple with one income of $25,000 pays $3,000 in taxes.

The same income earner, if not married, would pay a surcharge of $1,000.

Marriage bonus: A single person with an income of $25,000 pays $4,000 in taxes.

If this person marries someone with no income, the couple gets a bonus of $1,000.

Childless surcharge, two earners: A married couple with two incomes of $12,500 ($25,000 total) and two children pays $3,000 in taxes, as a couple.

The same couple, if it had no children, would pay a surcharge of $1,000.

Child bonus, two earners: A married couple with two incomes of $12,500 ($25,000 total) and no children pays $4,000 in taxes, as a couple.

The same couple, if it had two children, would get a bonus of $1,000

Childless surcharge, one earner: A married couple with one income of $25,000 and two children pays $3,000 in taxes.

The same couple, if it had no children, would pay a surcharge of $1,000.

Child bonus, one earner: A married couple with one income of $25,000 and no children pays $4,000 in taxes.

The same couple, if it had two children, would get a bonus of $1,000.

Notice that, as under current American law, couples with one primary earner received a marriage bonus and those with two earners a marriage surcharge (penalty): the marriage surcharge / single bonus condition is set for two-earner couples, the single surcharge / marriage bonus one for one-earners. We kept the one and two-earner couple conditions for childless surcharge / child bonus conditions, generating the final two pairs. But we had no hypothesis that the evaluation or framing effects of the child bonus / surcharge would vary with one or two earners; we found that it did not, and thus ultimately collapsed the data.

4.1.2 Results

Table 1 shows the mean ratings according to question (allocation vs. fairness), type of condition (marriage vs. children), number of earners, and bonus vs. surcharge, transformed so that the middle of each six-point response scale is 0. For the allocation judgments, positive numbers represent "too much for high income and too little for low income," with "too much" set equal to $+3$, and so on. For the fairness judgments, positive numbers represent fairness, with "as fair as possible" set equal to $+3$, and so on. Table 1 collapses over the high-low bonus / surcharge manipulation.[4]

Insert Table 1.

For both the allocation and fairness judgments, bonuses were rated more favorably than surcharges ($p < .05$ by t test in each of the four rows of Table 1, with t values ranging from 2.16 to 6.07). The results for the fairness judgment support the penalty aversion hypothesis. People think that penalties are just less fair on the whole.

These results for the allocation judgment (in which the question concerned the allocation between rich and poor), the results supported the Schelling effect (contrary to Traub, 1999), for both types of bonuses and surcharges (marriage and children). In general, sub-

[4] There were no consistent interactions involving effects of the magnitude of the bonus or surcharge for low-income ($1,000 vs. $2,000) and high-income ($3,000 vs. $6,000). To check to see that subjects were answering the questions as asked, we compared those cases in which the bonus or surcharge was $6,000 for high income and $1,000 for low income with the cases in which it was $3,000 for high and $2,000 for low. Allocation judgments showed a large difference ($p < .001$ by t test for both marriage and children), with means of .53 vs. $-.52$. (Recall that positive values mean "too much for high-income and too little for low-income.") Overall fairness judgments were not significantly affected (means of -.46 -.36, respectively). Thus, it seems that subjects were answering the questions as they were intended.

jects judged the bonus allocation to be too much for high-income taxpayers and too little for low-income taxpayers (as shown by the positive values in the upper right quadrant of Table 1) and the surcharge allocation as too much for low-income taxpayers and too little for high-income taxpayers (as shown by the negative values in the upper left). In each of the four conditions there are more subjects showing the hypothesized pattern (positive for bonus, negative for surcharge) than the reverse (19 vs. 1 for children 1-earner, 13 vs. 1 for children 2-earner, 10 vs. 3 for marriage 1-earner, 13 vs. 5 for marriage 2-earner; all significant at $p < .05$ by a one-tailed sign test).

Experiment 1 showed that subjects had both a penalty aversion and a desire for some progressivity in tax: desires that can be brought into tension with the rather transparent bonus or surcharge manipulation, as in the Schelling effect. In particular, subjects do indeed seem to want bonuses to go to low-income people and penalties to high-income people. But, of course, any bonus can be stated as a penalty. Or vice versa.

4.2 Experiment 2

Experiment 1, with its two income levels, had explicitly brought progressivity into play in subjects' perceptions, and had concerned both marriage and child bonuses or surcharges. Experiment 2 strictly concerned the tax-law treatment of marriage, holding household income equal, and presuming a progressive marginal rate system, which remained "off-stage," as it were. Rather than testing for the evaluation of bonuses versus penalties, alone, we added realistic options for accommodating marriage into an individualized tax system. The framing manipulation involved a change in tabular presentation. One type of presentation put married and unmarried in adjacent rows; the other type put one-earner and two-earner couples next to each other. This experiment thereby tested for a neutrality bias.

Recall that in a tax system with progressive marginal rates, there is an unavoidable conflict between the norms of "marriage neutrality" (no effects of marriage on total tax owed, that is, neither penalties nor bonuses) and "couple's neutrality" (equal-earning households pay equal tax). This second experiment, presuming progressivity, used four different types of rate structures to get at different permutations of bonuses and penalties.

The first was *Separate Filing*, now used in most developed countries around the world. This system treats spouses as individual taxpayers and is thus marriage but not couples neutral, given progressive marginal rates. It has no marriage bonuses or penalties.

The next three rate structures all uphold couples neutrality at the expense of marriage neutrality. *Singles rate* taxes all couples as if they were a single taxpayer; it thus has marriage penalties (for two-earner couples) but no bonuses. *Equals rate* taxes all married couples as if they were two equal-earning single persons, each earning one-half of the total household income. This system, in place in the United States from 1948 to 1969 and now prominently featured in legislative proposals for reform , has only marriage bonuses (for one-earner couples), no penalties. Finally, what we termed *Split-the-difference* is a compromised rate structure falling between the Singles and Equal rates; it thus has some penalties and some bonuses, depending on whether a couple consists of one or two monetary income earners. This parallels the current American system.

We expected under the neutrality bias that the evaluations of different tax proposals would depend on the frame. Holding household income constant, there were two variables: whether or not a couple was married, and whether or not there were two monetary income earners. This enabled two distinct perspectives. Holding the number of earners constant while comparing married and unmarried couples makes marriage non-neutralities transparent. There is a bonus for one-earner couples under the Equals and

Split-the-difference rate structures, and a penalty for two-earner couples under Singles and Split-the-difference. On the other hand, holding marital status constant while comparing the difference between one and two-earner couples makes couples non-neutrality transparent. This presentation sets apart Separate Filing, which alone violates couples neutrality by taxing one-earner married couples more than equal-earning two-earner ones.

We asked subjects to evaluate a change from one tax rate policy to another on each of twenty-four screens. We presented two types of rate structures (Separate Filing, etc.) in tabular form, in two formats. One format, the "marriage focus," juxtaposed an unmarried and married couple, holding the number of earners constant. We expected this format to call attention to the marriage bonus or penalty, and thus to exaggerate whatever reactions subjects had to marriage non-neutralities. The other format, the "earners focus," juxtaposed one and two-earner couples, holding marital status constant. We expected this format to call attention to the one-earner vs. two-earner comparison and thus to make separate filing less desirable, as a violation of couples neutrality. We presented a change from each rate policy to each other, for twelve permutations, doubled by the two different focal presentations (earners and marriage). We also had eight screens asking subjects to evaluate each rate policy, presented alone, in each of the two focuses, for a total of thirty-two screens.

Finally, we hypothesized a status-quo effect, because we were asking subjects to consider a change from one tax-rate system to another. Given a programmed revenue-neutral constraint, described below, every change harms some and helps others. The status-quo hypothesis predicts a general resistance to change, a mean response against it.

4.2.1 Method

One hundred subjects completed a questionnaire on the World Wide Web. Their ages ranged from 14 to 72 (median 30), 33% were male, and 23% were students.

The questionnaire, called "Taxes," began with an introductory page as set forth in the appendix. This initial page explained the four types of rate structures (Separate Filing, Singles, Equals and Split-the-difference), the precise pattern of marriage penalties and bonuses that the alternative systems produce, and what the subjects would be asked in the screens that followed.

A sample screen about change in policy was:

Tax on $50,000	**Current plan: Singles rate**	**Proposed plan: Equals rate**
Single person	$10,800	$15,200
Two singles, equal earners	$4,800	$6,800

Tax on $50,000	**Current plan: Singles rate**	**Proposed plan: Equals rate**
Married couple, one earner	$10,800	$6,800
Married couple, equal earners	$10,800	$6,800

Would you favor changing to the new plan?	How fair is this change?
Strongly favor changing	Very fair
Favor changing	Fair
Oppose changing	Unfair
Strongly oppose changing	Very unfair

Once again, the subject had to answer the question in each column, now on a four-point scale, and click on another button at the bottom of the screen to continue. We call

the questions in the separate columns the preference question and the fairness question, respectively.

The two separate tables atop the screen, marked by the repeated column headings, set the focus. The example shows an earners focus: a different number of earners is juxtaposed in each table with marital status held constant. In the marriage focus, the lower row of the first table and the top row of the second table were switched, so that each table compared an unmarried to a married couple, holding the number of earners constant: marriage was the variable.

The four proposals generated the following tax rates on a total income of $50,000 for married and unmarried couples, with one earner or two. Rates are much lower for two singles who are both earners (or separate filing taxation of a married couple with two earners), because each earns $25,000 and, given marginal rate progressivity, thus pays tax at a lower effective rate than a single individual (couple) making twice as much.

	Single		Married	
	One earner	Two earners	One earner	Two earners
Separate	$12,600	$5,600	$12,600	$5,600
Singles rate	$10,800	$4,800	$10,800	$10,800
Equals rate	$15,200	$6,800	$6,800	$6,800
Split the difference	$12,800	$5,700	$8,500	$8,500

These tax burdens show the non-neutralities in play. Separate filing, alone, violates couples neutrality, as the final two columns demonstrate. Each other proposal — but not Separate — shows some change in moving from the two left columns, for unmarried persons, to the two far right ones, for married couples. Singles shows a marriage penalty, as

the two-earners' tax increases on marriage; Equals shows a marriage bonus, as the one-earner's tax decreases on marriage; and Split-the-difference lives up to its name by having both a marriage penalty and a bonus.

We attempted to make the tax rates realistic by keeping total revenue constant for the four proposals. In order to estimate the total revenue from each proposal, we needed first to estimate the number of taxpayers as a function of income. To do this, we fit gamma functions to Internal Revenue Service data on the number of single and married taxpayers in each income range. We assumed that married taxpayers were half one-earner and half two-earner. The functions were $882\,x\,e^{-x/7034}$ for singles and $47\,x\,e^{-x/33643}$ for married one-earner and two-earner couples, scaled by an arbitrary constant. We used these functions to equate total revenue across the range of incomes (by summing the tax rates over many income levels and then determining a constant multiplier that would make total revenue constant).

Note that this effort to maintain revenue neutrality, while realistic, created a pattern of penalties and bonuses that would not be present in a more simplified presentation. For example, in moving from Separate to Equals, the loss of revenue among the pool of married persons means that there must be, *ceteris paribus*, an increase in the Singles rate. Thus, in moving from Separate to Equals, subjects can see a marriage penalty: compare Separate, single, two earners to Equals, married, two earners. Yet there are, in an analytic sense, no marriage penalties (only bonuses) *within* Equals: compare Equals, single, two earners to Equals, married, two earners.

4.2.2 Results

We can get an overall measure of how people evaluated each of the four proposals by adding their responses (4 for most favorable, 1 for least favorable) when that proposal was the new one and subtracting their responses when it was the current one. Evaluated in this way, and combining both preference and fairness questions (which did not differ significantly), the means were significantly different ($F_{3,396} = 13.15, p = .0000$).

Table 2 shows these means and the corresponding proportions of subjects who favored the proposals on the average (relative to other proposals).

Insert Table 2.

Subjects generally found the Equals rate proposal to be most attractive and Separate to be least attractive. They thereby showed a distinct preference for couples neutrality, upheld in all but Separate, over marriage neutrality, upheld only in Separate — the precise bias evident in American law since at least 1948. Subjects also showed a marriage-penalty aversion. Among the rate structures upholding couples neutrality, subjects in the aggregate (with substantial individual variation) ranked them according to least punitive: Equals has no marriage penalties, only bonuses; Split-the-difference has mid-range penalties and bonuses; Singles has only penalties.

Most important, however, the framing manipulation affected the evaluation of Separate Filing, confirming the neutrality bias. To test this, we compared judgments of Separate in the two focus conditions. These judgments (computed as before) are the averages of the comparison of Separate with each of the three other proposals. Combining preference and fairness judgments, the mean ratings were $-.18$ in the marriage focus and $-.37$ in the earner focus ($t_{99} = 2.30$, $p = .0117$ one tailed). The results were essentially the same for

preference (means –.22 vs. –.38, $t = 1.85$, $p = .0335$) and fairness (–.14 vs. –.36, $t = 2.56$, $p = .0061$). In sum, subjects judged Separate Filing more harshly when they saw more clearly its effects on one-earner vs. two-earner couples. Table 3 presents these values.

Insert Table 3.

The other three proposals — Singles, Equals, and Split-the-difference — each uphold couples neutrality. Subjects indeed evaluated them more favorably in the earners focus ($t = 2.30$, $p = 0.0234$, for the combination, although each was not significant by itself). That is, subjects judge them more harshly when they saw more clearly how they violated marriage neutrality. This is again evidence of a neutrality bias.

Finally, Experiment 2 produced a small status-quo effect. The mean rating combining preference and fairness was 2.43, which was significantly less than the middle of the 1 to 4 scale, 2.5 ($t = 2.058$, $p = .0423$ two tailed). This effect was significant only for fairness (mean rating 2.40, $t = 2.70$, $p = .0083$), not preference ($t = 1.02$). The effect was especially large for moving into or out of the Equals rate ($t = -2.2387$, $p = 0.02742$, combining both preference and fairness). Note that Equals had the largest single tax, the $15,200 levied on a single unmarried earner, as well as the largest bonus (the $8,400 marriage bonus for one-earner couples) — and hence, of necessity, the largest penalty (that is, the $8,400 singles penalty for one-earners who do not marry). It is, however, striking that the status quo effect, long a feature of the cognitive psychology lietarure (Kahneman, Knetsch and Thaler, 1991), looms less large in our findings than the neutrality bias.

4.3 Experiment 3

In Experiment 3 we brought children back on stage. We presented subjects with three different family types, with and without children, and asked them simply to fill in the appropriate tax rates for each case. The three family types were single, married couples with equal income, and married couples with unequal income. The equal earners were presented twice: once the subject was asked about the tax *per person* (for comparison with the single taxpayer) and once about the tax *per couple* (for comparison with one-earner couples).

Comparison of these types of households with open-ended questions allowed us to assess the perception of the marriage bonus (single vs. one-earner couple) and the marriage penalty (single vs. one member of a two-earner couple), as in Experiment 2, and a child benefit, as in Experiment 1. In addition, we could test for something new, a policy proposal not tracking any seriously proposed contemporary reform: what we call a *worker effect*. By comparing equals — two-earner married couples — with one earner couples, we could see whether subjects wanted to tax equal-earning couples the same, or to impose higher or lower taxes on two-earners. This possibility was not fully allowed in Experiment 2, which included only actually proposed solutions to the marriage penalty issue: Equals, Singles, and Split-the-difference all presumed couples neutrality, and Separate generated marriage neutrality but only by having far lower taxes on two-earner than on one-earner couples. Left on their own, would subjects generate a small bonus for two-earner families, mimicking the effect of say a child-care credit, or not? Finally, the open-ended design allowed us to use subjects' own answers in evaluating the desirability of couples neutrality, marriage neutrality, and progressive marginal tax rates — the Bermuda triangle of tax

policy affecting married couples — as well as marriage and child bonuses and penalties.

In the first part of the experiment, subjects answered in percent and in dollars. Consistent with the metric effect, we hypothesized that taxes would be more progressive when the answer was given in percent. When subjects answer in dollars, they see that higher-earning couples pay more taxes even if the taxes are not progressive, and they might think that "more taxes for higher earners" is fair — a progressive fiscal illusion effect. Such effects have been found in the marketing literature with respect to discounts offered on high-price or low-price items (Chen et al., 1998).

In the second part of the experiment, subjects were shown their own (dollar) responses to one family-type in the first part and filled in taxes for another type. The second part thus permitted subjects to see, one above the other, the two families of interest in each comparison. We could compare the resulting direct judgments to the implicit judgments in the first part.

4.3.1 Method

Sixty-two subjects completed a questionnaire on the World Wide Web. They ranged in age from 15 to 72 (median 32); 35% were male.

The introduction to the questionnaire is set out in an appendix; we followed a much simpler format than in prior experiments.

In the first part of the experiment, consisting of 16 items in a different random order for each subject, subjects simply filled in what they thought were appropriate taxes for eight types of families. Here is a typical item:

This item concerns the tax for a married couple with *one earner* and two children.

Fill in the amount you think is fair for each level of income. Answer in dollars, without the dollar sign:

If the *couple* makes $25,000, a fair tax for the *couple* is $

If the *couple* makes $50,000, a fair tax for the *couple* is $

If the *couple* makes $100,000, a fair tax for the *couple* is $

If the *couple* makes $200,000, a fair tax for the *couple* is $

Subjects indicated appropriate taxes for each family type on incomes of $25,000, $50,000, $100,000, and $200,000. Eight of the items asked for taxes in dollars; eight in percent.

Four of the eight family types had no children. The other four had two children. Each group of four family types contained a single income earner (Single), a married couple with one earner (One-earner), and two conditions with a married couple and two earners. In one of these two equal-earner conditions (Equal 2), the question asked about the couple's *total* taxes; in the other, the question asked about the taxes *per person* (Equal 1). The marriage penalty is, in essence, the difference between Single and Equal 1: the combined tax on a two-earner couple increases on marriage, and thus their per person tax rates do, as well. The marriage bonus is, in contrast, the difference between Single and One-earner. Finally, comparison of One-earner with Equal 2 allowed us to assess the worker effect, that is, the bonus for working couples, if any.

In the second part of the experiment, consisting of 20 items, we asked subjects to fill in values based on a comparison between two types of families. This allowed us to ask directly about the relevant comparisons. Each item had the following form:

> Earlier, you said, when you were asked about [for example] the tax for a single (unmarried) person with no children, [the complete table of responses].

> This item concerns [for example] the tax for a married couple with one earner and no children.
>
> Fill in the amount you think is fair for each level of income [followed by the same input table with blank fields].

The comparisons were:

- Marriage penalty — Single vs. Equal 1;
- Marriage bonus — Single vs. One-earner;
- Worker effect — Equal 2 vs. One-earner; and
- Child bonus — Children vs. No children.

Each of the first three comparisons involved Children and No-children, in both directions, for 12 screens (3x2x2). There was one Child-bonus comparison for each of the four basic family types, again in both directions, for the remaining 8 screens (4x2). As always, each subject saw the 20 screens in a different random order. We used only dollars, not percents, in this part.

4.3.2 Results

Part 1: Isolated Judgments

Table 4a shows the mean responses to the questions in the first part, averaging across income levels, with dollar responses converted to percent.

Insert Table 4.

On the whole, there was a statistically significant child bonus; taxes were lower with children ($t_{61} = 5.99$, $p = .0000$, two tailed, combining dollars and percent). There was also

a marriage penalty; taxes were higher for Equal 1 than for Single ($t = 2.03$, $p = .0469$). Notice, though, that this is true only when there are children. There is a marriage bonus; taxes were higher for Single than for One-earner ($t = 3.41$, $p = .0012$). Finally, there was a small (not significant) work penalty: taxes were higher for Equal 2 than for One-earner ($t = -1.78$, $p = .0796$).

The metric effect was dramatic. Taxes were higher when the response was in percent ($t = 4.57$, $p = .0000$). As shown in Table 4b, taxes were also more progressive when the answer was in percent. To measure progressivity, we computed the slope of the tax rate (in percent), treating the four income steps as equal units. The slope is the percent change per step. Progressivity, measured this way, was significantly higher for percent than for dollars (5.2 vs. 2.6, $t = 6.45$, $p = .0000$).

Part 2: Comparative vs. Isolated Judgments

In part 2, subjects indicated tax rates for one family type while viewing their answers for another type. The comparisons were chosen to emphasize the effects of interest: marriage bonus, marriage penalty, worker effect, and child bonus. The comparative responses amount to a transparent within-subject design. The subject makes a judgment about one type of family with the other type in view. (In contrast, the original responses in Part 1 are more like a between-subject design. The subject made ratings for each family alone, without any comparison in view.) The following table shows the size of each effect overall (in absolute percent difference) for the initial dollar responses and for the comparative responses.

Insert Table 5.

In the original, open-ended format of Part 1, respondents in the aggregate (with sub-

stantial individual variation), developed child bonuses, marriage bonuses, and marriage penalties. These are all parallel to elements in current United States law. Most strikingly, faced with a comparison between two-earner families and one-earner families, in what we call the worker effect, respondents created a two-worker *penalty*, hence the negative number. That is, respondents were willing to violate couples neutraility by having two-earner couples pay *more* than one-earner ones. This result runs counter to the general sense among economists that one-earner households, on account of the untaxed "imputed income" from household production, are better off than two-earner households with the same nominal income in a strictly economic sense. (Likewise, two-earner households have more work-related out-of-pocket expenses, such as child-care, than one-earner households; see McCaffery 1997). We mean to test this result, which may reflect a sense that two-earner households are indeed somehow better off, perhaps on account of the consumption-value of work, in future research.

Meantime, in the comparative framed task of Part 2, subjects did not back down from this pattern of bonuses and penalties. Indeed, although they wanted to decrease the marriage bonus, they also wanted to increase the marriage penalty. The marriage penalty itself is now significantly positive ($t = 2.92$, $p = .0048$). Similarly, although the results lacked strong statistical significance, subjects increased the child bonus and deepened the two-worker penalty. These results suggest further that independent principles are doing much of the work; subjects are not necessarily averse to bonuses and penalties, and are willing to create non-neutralities, as long as these line up with particular, substantive ideals: help children, reward stay-at-home parents, penalize two-earner families.

5 Conclusions

Consistent with its sources and inspirations, the research we have presented here has relevance to two bodies of literature.

The first is the cognitive psychological literature on framing, and the recent attempts to bring system and order to the field. Druckman (2001) characterizes this quest when he writes that "[w]hat is needed is a unifying framework to organize the wide variety of framing effect results." We agree, although we also caution that the need, or desire, for order should not take pride of place over the search for possibilities. Thus far, the attempt to bring order to the framing effects literature has perhaps understandably focused on sorting through decades of experimental findings and classifying the framing problems themselves, along analytic lines (Levin, Schneider, & Gaeth, 1998; Druckman 2001). The resulting taxonomies have been helpful, and we believe that, in the end, they might be part of the answer. But our approach is different.

Rather than looking to the characteristics of the verbal framing problems themselves, we have focused on characteristics of individual judgment and decision-making. Consistent with McCaffery and Baron (in press), Camerer (2000), and Read, Loewenstein, and Rabin (1999), we believe that many inconsistencies and biases in decision making and other forms of judgment, such as evaluation, follow from a kind of isolation effect, a failure to focus on the entire picture.

Specifically, in the case of the experiments we have presented, we expected that subjects would bring independent principles to bear on their consideration of the admittedly complex, though realistic, real-world tax settings. Thus subjects had general norms — what we might call process norms — such as "do no harm" (penalty aversion) and "treat

likes alike" (neutrality bias), along with the more familiar "effect no change" (status quo bias). The trouble is that these principles can be brought into conflict in real-world tax settings, and framing manipulations can draw attention to the violations of one or another principle, vis-a-vis one or another group. At the same time, more substantive norms, such as "help children," which we observed quite strongly in Experiments 1 and 3, come into play in tax. Finally, whatever biases emerge can be exacerbated by the effects of progressive marginal tax rates, which themselves can lead to confusion, as in the metric effect — when the principle of "making the rich pay their fair share" yields different results when the problem is presented in dollars or percent.

These findings suggest a different agenda for framing-related research. We can try to unpack the separate principles in play; consider how different frames make certain principles more or less salient; and begin to explore the decision theoretic structures that lead subjects to satisfy the most salient commitment, ignoring other less salient matters.

The second — and very much related — body of literature concerns citizens as decision makers, or as inputs in a social decision-making process (Druckman, 2001; Sniderman, 2000). Tax, our particular focus, is in itself a very important political matter, though we believe that our findings have wider relevance than tax alone. The kinds of decisions that real-world tax policymakers must make are complex, and the incentives for the citizen in a large country to be fully informed about them are minimal. Yet the opportunities for framing manipulations, as we have seen, are rife. How can we even get to the citizen preferences to communicate to the lawmaker in the first instance?

Tversky and Kahneman (1986) noted three criticisms of the framing and related literature. Skeptics asserted that "violations of the standard model" were "(i) restricted to insignificant choice problems, (ii) quickly eliminated by learning, or (iii) irrelevant to eco-

nomics because of the corrective function of market forces." While Tversky and Kahneman and others (Thaler, 1999, Camerer 2000) have offered compelling refutations of these doubts in a wide range of settings, we conclude by noting that citizen preferences on public political matters such as tax are especially unlikely to be immune from framing manipulations. The problems of tax are large and significant. The costs of learning are high, and the benefits of knowledge — given the miniscule input the average citizen has on policy formation — tiny. (Thus we do not share the sense of Druckman (2001) that framing effects contradict citizen "competence;" in a simple cost-benefit calculus, it is simply not worth it to learn about the intricate policy choices embedded in systems such as the tax one.) Finally, notwithstanding occasional nods of optimism from scholars (see Druckman (2001)), it is difficult to place too much faith in the non-market forces of politics to serve as correctives to cognitive heuristics and biases in such matters as tax. When was the last time some politician, any politician, tried to explain the incidence of a "hidden" tax (McCaffery 1994)? What incentive do politicians of either party have for explaining the complexities and conflicts involved in accommodating families in the tax system? And so on.

In the end, the best hope for a better future may lie, at least in part, back in the academy, connecting the two dots. A careful consideration of the mechanisms of framing effects in specific, detailed, nuanced areas such as tax might lead to effective de-biasing and educational correctives, to help policymakers arrive at "truer," more resilient and stable, citizen preferences. Or so we can hope.

6 References

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7 Appendices

7.1 Experiment 1 Instructions

This questionnaire is about how marriage and children affect people's taxes in a country like the U.S.. Various proposals concerning the "marriage penalty" involve questions about what is fair. In fact, people can get either a marriage penalty or a bonus, depending on their incomes before marriage. In this questionnaire, we refer to surcharges (extra taxes) and bonuses. "Surcharge" is a more neutral word than "penalty".

There are 32 screens, each with two questions. The questions are about fairness. The first question is about how the surcharge or bonus is allocated to high-income and low-income taxpayers. You are given two income levels, one with $25,000 and the other with $100,000. You make take these to represent relatively low and high incomes, for couples, respectively. When you answer this question, imagine that there will be a bonus or surcharge, and the only question is how it is allocated to different income levels.

The second question is about what you think of the bonus or surcharge or bonus itself. The surcharges or bonuses involve both marriage and children.

Please take your time to answer both questions carefully. Bear in mind that they are different questions. The first is about allocation of the surcharge or bonus, and the second is about the surcharge or bonus itself.

7.2 Experiment 2 Instructions

Each of the following cases is about a proposal for taxes in developed country like the U.S. Taxes are unfortunately very complex. This questionnaire has been designed to help us learn more about what people think of as a fair tax rate system, specifically about how

marriage is taken into account. Here is a little background:

1. Some taxes are progressive. This means that your first $10,000 is taxed less than your next $10,000, and so on. All the taxes here are progressive.

2. The tax system has to make choices about how, if at all, to take marriage into account. Here are the main possibilities:

Separate filing: Married couples could just pay separately, each on his or her own income.

Singles rate: A married couple could pay the same tax that a single person with the same total household income as the couple has would pay.

Equals rate: A married couple could pay the same tax that two unmarried people each with one-half the total household income would pay.

Split the difference: something in between the Singles and Equals rates.

3. This choice has different effects on couples with one primary earner versus couples with two relatively equal earners, specifically:

The equals rate provides a marriage bonus - a reduction in taxes - when a single earner marries someone without a wage income.

The singles rate provides a marriage penalty - a tax increase - when two people with equal incomes marry each other.

Split-the-difference provides some bonus to primarily one-earner households and some penalty to two-earner ones.

Finally, Separate filing means that, while there would be no marriage bonuses or penalties (because marriage is irrelevant for tax purposes), primarily

one-earner couples would pay more tax than two-earner ones with the same total household income.

In completing the following questionnaire, we are asking you to make judgments about

changes in taxes for couples, or single unmarried earners, who make $50,000 per year. The changes maintain constant revenue. So if the tax on one group decreases, the tax on another group will increase. We also ask you to make judgments of the plans on their own. We show you the taxes for the following types of households:

1. A single person.
2. Two single people (two non-married people who earn the same income - they may or may not live together).
3. A couple with one earner.
4. A couple with two equal earners.

By comparing the two-single people to the married people with equal total income, you can see what happens when two equal earners get married. Likewise, by comparing the single-person tax to the ”married, one-earner” tax, you can see what happens when a single person with an income marries someone without an income. Finally, by comparing the one-earner couple to the two-earner couple you can see whether such couples differ.

There are 32 screens. 24 of them ask you to imagine that one tax scheme is in effect, but a switch to another scheme is being considered. You are asked about what you think of the change. The remaining 8 ask you about each scheme on its own (twice each - but you need not try to remember your responses).

7.3 Experiment 3 Instructions

This questionnaire concerns your opinions about the fairness of taxes. In each case, you are given some information and you are asked to fill in the tax rates you think are fair. These rates are for developed countries like the U.S. Currency is in U.S. dollars.

Bear in mind that you have to raise about 25% of total income to run the government. This

does not mean, however, that your answers in any one case must average out to 25%. This is just an approximate guideline.

		Surcharge		Bonus	
		1 earner	2 earners	1 earner	2 earners
Allocation	Children	-0.65	-0.18	0.35	0.36
	Marriage	-0.17	-0.12	0.27	0.35
Fairness	Children	-0.74	-0.36	0.01	-0.10
	Marriage	-0.31	-0.66	-0.05	-0.54

Table 1. Mean ratings in Experiment 1. Units are steps on the response scale ($+3$ to -3), with 0 as the middle of the scale.

Proposal	Mean relative rating	Proportion who favored
Separate	-.28	.415
Singles	-.20	.465
Equals	.33	.595
Split-the-difference	.15	.550

Table 2. Mean ratings and proportions of subjects favoring each proposal over other proposals, Experiment 2. For ratings, 0 represents neutrality, relative to other proposals. For proportions, .5 represents neutrality.

Proposal	Focus: Marriage	Earners	p
Separate	$-.18$	$-.37$	.0117
Singles	$-.24$	$-.16$	N. S.
Equals	.31	.34	N. S.
Split difference	.12	.18	N. S.

Table 3. Mean rating as a function of focus for four proposals, Experiment 2.

	Single	Equal 1	Equal 2	One-earner
Answer in dollars:				
No child	14.7	14.0	13.8	13.4
Child	12.4	13.3	12.5	11.9
Answer in percent:				
No child	17.5	17.6	17.3	16.5
Child	15.1	17.4	15.2	14.7

Table 4a. Mean responses (in percent) to question about fair taxes, Experiment 3, part 1.

	$25,000	$50,000	$100,000	$200,000
Dollars	9.3	11.7	15.2	16.8
Percent	9.2	13.0	18.8	24.6

Table 4b. Mean fair taxes (in percent) as a function of income, Experiment 3, part 1.

Effect	Original	Comparative	Difference
Child bonus	1.45	1.76	$t = 1.62$, N.S.
Marriage bonus	0.89	0.45	$t = 2.22$, $p = .0300$
Marriage penalty	0.13	0.91	$t = 2.43$, $p = .0180$
Worker effect	-0.54	-0.70	$t = 0.77$, N.S.

Table 5. Comparison of each effect in Part 1 (Original) vs. Part 2 (Comparative judgment) in Experiment 3, in percent.