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# The value of tax progressivity: Evidence from survey experiments

Benoît Tarrowx

Univ Lyon, Université Lumière Lyon 2 and GATE

GATE UMR 5824, F-69130 Ecully, France

tarrowx@gate.cnrs.fr

## Abstract

The aim of this paper is to investigate how people value tax progressivity. More precisely, I study the potential trade-off between any improvement in the final income distribution and the progressivity of the tax schedule. To do this, I designed survey experiments in which respondents were asked to rank or to choose between different taxation-redistribution schemes with different treatments varying in terms of information availability: (1) when only information about final incomes is provided; and (2) when information about average tax rates is also available. Using a within-subject design, the instability of rankings between (1) and (2) indicates whether or not respondents value tax progressivity. I find that information about tax rates significantly affects respondents' judgements about tax schemes. They exhibit a strong preference for tax progressivity, i.e., they accept a fall in the quality of the final income distribution in exchange for progressive taxation. The results of an additional treatment suggest that the mere fact of providing new information cannot account for this finding.

**JEL Codes:** D63, H21, C9

**Keywords:** tax progressivity, optimal taxation, survey experiment

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# 1 Introduction

The modern theories of optimal income taxation as initiated by Mirrlees (1971) emphasize the limitations of raising tax revenues due to the fact that it is not possible to observe information about individual abilities. The critical postulate of this approach is that the social planner is consequentialist, i.e., the planner’s preferences in taxation schemes depend solely on the quality of the final situation (Sen, 1987). The planner is neutral towards how the tax burden is allocated among taxpayers. This paper aims to investigate whether people support such a view or, on the contrary, exhibit a preference for some forms of taxation over others. In particular, I design a survey experiment in order to study whether or not people attach a value to tax progressivity *independently of the consequences on the final situation*.

To illustrate the problem, consider a social planner who has the choice between the two (feasible and incentive-compatible) taxation-redistribution schemes described in Table 1: *A* is not progressive while *B* is. As the work effort of the richest individuals decreases with taxation, *A* allows for tax revenues and a level of disposable income for the worst-off individuals to be higher than with *B*. How should *A* and *B* be compared? Is *A* fairer than *B*, or *B* fairer than *A*? According to a consequentialist view with sufficient aversion to inequality (i.e., giving priority to the worst-off),<sup>1</sup> *A* may be preferred to *B*. However, tax progressivity may be perceived as a desirable property of taxation: i.e., it may be an argument of the social objective function, or compatible with a fair sharing of sacrifice among people.<sup>2</sup> A strong preference for progressive taxation should lead to judging *B* as the fairest, while a larger weight on the final situation raises the preference for *A*.

	Policy <i>A</i>			Policy <i>B</i>		
	Poor (30%)	Middle (60%)	Rich (10%)	Poor (30%)	Middle (60%)	Rich (10%)
Pre-tax income	200	1800	3700	200	1800	3400
Post-tax income	1040	1440	3330	790	1620	2720
Average tax rate	-420%	20%	10%	-295%	10%	20%

Table 1: Illustration

To study how people deal with such a trade-off, I conducted survey experiments in which participants were placed in the position of the social planner and were asked to compare alternative tax and redistribution policies in terms of *fairness*. These alternatives differ in their pre- and post-tax income distributions and tax schedules, so that they are ranked differently according to consequentialist or non-consequentialist views. To elicit the participants’ preference for tax progressivity, I vary the information

<sup>1</sup>Here, it is considered that the social planner evaluates individual well-being only based on their post-tax income and excludes any form of inequality aversion in the manner of Fehr and Schmidt (1999) or Bolton and Ockenfels (2000). An illustration would be the sum of individual utilities,  $\sum u(x_i)$ , where concavity of the function  $u$  captures the aversion to inequality of the social planner.

<sup>2</sup>There are some historical instances showing that people are concerned with the fair sharing of taxation in a society. For example, Article 13 of the (French) Declaration of the Rights of Man and of the Citizen asserts that “For the maintenance of the public force, and for administrative expenses, a general tax is indispensable; it must be equally distributed among all citizens, in proportion to their ability to pay.”

sets they are provided with and study how adding a relevant piece of information affects their judgments about tax policies (see also Faravelli (2007) or Hurley et al. (2011) for a similar methodology). More precisely, participants are provided with two treatments differing in terms of information availability, which they face one after the other. In the first case, only the final incomes of different groups of workers are known, while in the second case, they are *also* provided with information about average tax rates. In this second treatment, they are also informed that the taxation affects the work effort made by some workers and, consequently, their gross earnings. The change in preferences over taxation alternatives reflects how respondents value progressivity as a desirable property of taxation.

The main result is that the respondents are likely to change their ranking of tax policies between the information contexts, i.e., adding information about average tax rates leads them to change their evaluation of the different taxation and redistribution policies. In particular, respondents tend to switch from a preference for a regressive taxation situation to a progressive one. This result suggests that they accept worsening the quality of the final situation (as elicited in the first treatment) in exchange for a more equal sharing of the tax burden. In other words, people seem to have an “intrinsic” taste for tax progressivity. To make sure that this result is not driven by the mere fact of receiving new information, I conducted a survey experiment, in which participants *only* faced the second treatment. In this way, they do not experience the addition of new information. Preference for tax progressivity is found to be robust to this experimental variation. To ensure that I do not only capture the people’s judgements of fairness but also their judgements about tax policy, an additional survey experiment was conducted. In this, the participants were invited to choose the policy they wished to implement for society. It appears that participants exhibit a taste for tax progressivity in this context.

The main contribution of this paper is to highlight that the ethical assumptions made by the Mirrleesian approach of optimal taxation might be at odds with people’s intuitions or opinions, at least in France. It provides evidence that their evaluation of policies may not be guided solely by their welfare consequences, and that procedural issues linked with the shape of the taxation scheme (how the final situation is reached) may matter. In particular people appear to attach a value to tax progressivity. Moreover, this finding also highlights the fact that people pay attention to *tax rates* while standard models focus on the distribution of post-tax outcomes. These findings may have valuable implications for optimal taxation theory. In particular, the policy recommendations derived from Mirrleesian models might be misleading, even if useful and informative. In this case, an effort should be made to incorporate real people’s normative beliefs into models in order to compose “socially acceptable” policy recommendations (Diamond and Saez, 2011; Gaertner and Schokkaert, 2012; Weinzierl, 2014). If the findings prove to be robust, this may prompt restrictions on the set of admissible taxation schemes: the social planner’s problem is that of choosing the one tax function that maximizes social welfare functions from *various progressive (or non-regressive) tax functions*. Alternatively, one may assume a mixed social objective that depends on the final situation and some desirable properties any taxation schemes should respect in order to be fair (Weinzierl, 2014; Saez and Stantcheva, 2016).

This paper is connected to a growing body of literature which aims to elicit people’s judgments con-

cerning social justice.<sup>3</sup> This line of research provides evidence that people often depart from utilitarianism and, conversely, prefer a mixed normative view. In particular, some studies provide evidence that people do not judge taxation and redistribution schemes only on the basis of the final distribution, but also consider pre-tax incomes and tax liabilities as relevant information. Using survey studies, (Weinzierl, 2014, 2017) shows that the majority of (American) respondents reject consequentialism (i.e., they reject full equalization if there are no efficiency costs) and, on the contrary, seem to endorse the principles of Equal Sacrifice and of benefit-based taxation. Saez and Stantcheva (2016) found that people judge tax and redistribution systems on the basis of various fairness principles, from utilitarianism (only post-tax incomes matter) to libertarianism (only tax liabilities matter). In a laboratory experiment run by Charité et al. (2015), respondents in the position of a social planner are found to have a lower preference for redistribution when taxpayers know their initial endowments, which can be interpreted as a consideration of the reference points of others. However, these papers study the effect of non-consequential principles on the preference for progressivity, but do not pay attention to progressivity as a desirable property of taxation. One exception is a paper by Gaertner and Schwettmann (2017). They use a questionnaire-based experimental study in order to examine how people allocate an extra tax burden between unequal individuals. If their respondents tend to opt for progressive schemes (at least in some Southern European countries), it is not clear whether the roots for such a preference are welfarist or non-welfarist.<sup>4</sup> My survey experiment study highlights the fact that respondents are willing to sacrifice total utility in exchange for progressive taxation, i.e., they attach an intrinsic value to tax progressivity. Finally, there is also a body of literature on the “claims problem”, that is, distributional conflicts when participants have acquired claims on resources (Gächter and Riedl, 2006; Bosmans and Schokkaert, 2009; Herrero et al., 2010). In such a context, proportionality seems to be judged as a fair means of sharing resources or losses. The results reported in this paper suggest that this kind of preference is no more valid in the context of choosing between taxation schemes.

This paper is organized as follows. The next section presents the theoretical framework of the paper and Section 3 details the survey experiment methodology. The results are presented in Section 4 and discussed in Section 5. The final section concludes.

## 2 The Social Planner’s Problem

Consider a society with  $I$  groups of individuals and denote  $p_i$  the proportion of the total population belonging to group  $i \in \{1, \dots, I\}$ . Denote  $c_i$  as the level of disposable income (or consumption) of group  $i$  and  $c_i = y_i - T(y_i)$  where  $y_i$  and  $T(y_i)$  are the gross income and tax liabilities of  $i$ .

The social planner’s problem is that of choosing the allocation that maximizes a *social ranking*, subject to feasibility and incentive compatibility constraints. Denote  $\{c_i^*\}_{i=1}^I$  as this allocation. The set of feasible allocations denoted  $\mathbb{F}$  consists of all the allocations such that  $\sum_{i=1}^I p_i T(y_i) = 0$  (a pure redistribution problem). The set of incentive compatible allocations is denoted by  $\mathbb{IC}$ . In this framework, a

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<sup>3</sup>See for instance Yaari and Bar-Hillel (1984), Konow (2000), Faravelli (2007), Bosmans and Schokkaert (2009), Cettolin and Riedl (2016), Tarroux (2015), and, for surveys, Konow (2003) and Gaertner and Schokkaert (2012).

<sup>4</sup>Indeed, people’s preference for progressive taxation may be rooted in the belief that it minimizes the loss of total utility.

consequentialist social planner aims to maximize a social objective function which depends on individual disposable incomes. Such a view can be defined as follows:

**Definition 1 (Consequentialist social planner)**

*The choice of a consequentialist social planner is the allocation such that:*

$$W[f(c_1^*), \dots, f(c_I^*)] \geq W[f(c_1), \dots, f(c_I)] \quad \forall \{c_i\}_{i=1}^I \in \mathbb{F} \cap \mathbb{IC}$$

where  $W : \mathbb{R}^I \rightarrow \mathbb{R}$  is such that  $W$  is increasing in each argument.

Two remarks should be made here. First, this definition is agnostic with respect to  $f$ . If one makes explicit use of utility information ( $f = u$ ), the social planner is said to be welfarist. Second, as it is specified,  $W$  encompasses a large range of social justice views from summation (if  $f = u$ , utilitarianism) to leximin or maximin criterion.

The *procedural* view requires the assumption of some *preferred* or *acceptable* tax properties *independently* of the consequences of taxation on the distribution of resources. Let  $\mathbb{T}$  be the set of all possible tax functions and  $\mathbb{A}$  be the set of acceptable tax functions with  $\mathbb{A} \subseteq \mathbb{T}$ . The latter may be more or less large. For instance, it may consist of all possible proportional ( $\mathbb{A}_{\mathbf{F}}$ ) or progressive ( $\mathbb{A}_{\mathbf{P}}$ ) tax functions:

$$\mathbb{A}_{\mathbf{F}} = \left\{ \left\{ T(y_i) \right\}_{i=1}^I : \frac{T(y_i)}{y_i} = \frac{T(y_j)}{y_j} \quad \forall y_i \neq y_j \right\} \quad ; \quad \mathbb{A}_{\mathbf{P}} = \left\{ \left\{ T(y_i) \right\}_{i=1}^I : \frac{T(y_i)}{y_i} < \frac{T(y_j)}{y_j} \quad \forall y_i < y_j \right\}$$

The following definition expresses the behavior of a procedural social planner:

**Definition 2 (Procedural social planner)**

*The choice of a procedural social planner is the allocation such that:*

$$W[f(c_1^*), \dots, f(c_I^*)] \geq W[f(c_1), \dots, f(c_I)] \quad \forall \{c_i\}_{i=1}^I \in \mathbb{F}_{\mathbb{A}} \cap \mathbb{IC}$$

where  $W : \mathbb{R}^I \rightarrow \mathbb{R}$  is such that  $W$  is increasing in each argument and  $\mathbb{F}_{\mathbb{A}} \subseteq \mathbb{F}$  the set of allocations such that  $T(y) \in \mathbb{A}$ .

This definition states that a procedural social planner chooses the allocation that maximizes the sum of individual utilities *under the constraint that* the corresponding tax function respects desirable properties.<sup>5</sup>

The latter definition might be considered too strong. Indeed, a progressive taxation will always be preferred to a regressive one even if the former leads to very poor final situations. To make clear the trade-off between the desirable properties which the tax function should respect and its consequences in terms of social welfare, a natural solution is to assume that the social objective function depends on multiple values. A (simple) example of a social objective function which captures value diversity and

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<sup>5</sup>According to this definition, a procedural social planner is minimally consequentialist, i.e., she is not indifferent to tax functions respecting some desirable properties. Thus, according to this definition, a procedural view takes the form of lexicographic preference.

allows an *ordering* of taxation schemes is:<sup>6</sup>

$$\mathcal{G} = W[f(c_1), \dots, f(c_I)] + \alpha \mathbb{I}[T(y) \in \mathbb{A}] \quad (1)$$

with  $\alpha$  denoting the intensities of the concern with the desirable properties of taxation;  $\mathbb{I}[T(y) \in \mathbb{A}] = 1$  if  $T(y) \in \mathbb{A}$  and 0 otherwise. It is obvious that  $\alpha = 0$  corresponds to the case of a utilitarian social planner, and that the larger  $\alpha$  is, the larger the weight on non-consequentialist value is.

I turn now to the formal definition of *preference for tax progressivity*. Suppose we have a pair of tax functions denoted  $\tilde{T}$  and  $\hat{T}$ . Both schemes are equivalent according to the level of social welfare but  $\tilde{T}$  is progressive while  $\hat{T}$  is regressive. A planner with a preference for tax progressivity should prefer  $\tilde{T}$  to  $\hat{T}$ . This intuition may be generalized as follows:

**Definition 3 (Preference for tax progressivity)**

For all pairs of allocations  $\{\tilde{c}_i\}_{i=1}^I$  and  $\{\hat{c}_i\}_{i=1}^I$  such that:

- (i)  $\{\tilde{c}_i\}_{i=1}^I \in (\mathbb{F} \setminus \mathbb{F}_{\mathbb{A}\mathbb{P}}) \cap \mathbb{I}\mathbb{C}$  and  $\{\hat{c}_i\}_{i=1}^I \in \mathbb{F}_{\mathbb{A}\mathbb{P}} \cap \mathbb{I}\mathbb{C}$ ;
- (ii)  $W[f(\tilde{c}_1), \dots, \tilde{c}_I] = W[f(\hat{c}_1), \dots, \hat{c}_I] + \Delta$  with  $\Delta > 0$ .

Then, there exists a level of  $\Delta$ , denoted  $\Delta^*$ , to which the social planner is indifferent between the two allocations. If  $\Delta^* > 0$ , the social planner has a preference for tax progressivity.

Take the illustration of a social objective function as defined in equation (1). A progressive taxation ( $\tilde{T}$ ) is always preferred to a regressive one ( $\hat{T}$ ) if, and only if:

$$W[f(\tilde{c}_1, \dots, f(\tilde{c}_I)), \dots] \geq W[f(\hat{c}_1), \dots, f(\hat{c}_I)] + \alpha$$

Thus the parameter  $\alpha$  can be interpreted as the maximum sacrifice in terms of social welfare that a planner accepts in exchange for tax progressivity.

### 3 The Design of the Survey Experiment

#### 3.1 Questionnaires

Participants were invited to imagine a society which consists of three distinct groups of workers (Groups I, II and III) differing in terms of *skill*.<sup>7</sup> The size of groups differs: Group I (the poorest) represents 30% of the population of the society, Group III is the richest 10% of individuals and, in the middle, Group II corresponds to the enlarged middle class (60% of the population). Differences in skills are due solely to differences in family background, which is not under the control of individuals. To make the problem as simple as possible for the respondents, it is clearly stated that individuals with higher skills earn more than the ones with intermediary skills, who themselves earn more than persons with the lowest skills, given that all of them make the same effort in the absence of taxation.

<sup>6</sup>See Weinzierl (2014) and Saez and Stantcheva (2016) for alternative theoretical frameworks.

<sup>7</sup>See Appendix E for the detailed instructions.

Participants in the position of an impartial social planner were asked to rank different redistributive policies in terms of *fairness* or to *choose* between them. Each policy involves a transfer of income from the two richest groups of people (i.e., Groups II and III) to the poorest one (i.e., Group I). The experimental design involves varying the availability of information about the different tax schemes given to participants. Table 2 summarizes the overall experimental design. There are three different questionnaires regarding the pieces of information provided to the participants and the task they are asked to do, i.e., giving a fairness ranking or choosing between policies.

	Treatments		
	MININFO	INFOTAXRATES	
Information about:			
Post-tax income	yes	yes	
Average tax rate	no	yes	
Questionnaire:			Wording
<i>Main</i>	yes	yes	Fair
<i>Information</i>	no	yes	Fair
<i>Choice</i>	yes	yes	Choice

Note: in 'Fair' questionnaires, subjects are asked to rank policies in terms of fairness; in 'Choice' questionnaire, they are asked to choose between the policies.

Table 2: Summary of the survey experiment design

The *Main* questionnaire consists of two treatments, which are presented successively to respondents (within-respondent design). In both treatments, they were asked to rank the five redistributive policies (policies A to E) described in Table 3.<sup>8</sup> Respondents were told to:

“rank the five alternative policies from the fairest (1) to the least fair (5).”

	Post-tax income distribution			Average tax rates	
	Type I	Type II	Type III	Group II	Group III
Policy A	550	1800	2450	0%	30%
Policy B	925	1530	3145	15%	15%
Policy C	1100	1350	4000	25%	0%
Policy D	1040	1440	3330	20%	10%
Policy E	790	1620	2720	10%	20%

Table 3: Alternative policies

<sup>8</sup>Note that the level of incomes is labelled in euros and participants are likely to be familiar with such amounts. In 2013, the *average* gross and disposable equivalent incomes of the poorest 20% of individuals were €576 and €925, that of the 3rd quintiles were €1,793 and €1,673, and, finally, that of the richest 20% of individuals were €4,757 and €3,822 respectively (INSEE, 2014).



The first treatment, called MININFO, may be considered as the baseline: the only information respondents have for ranking alternative policies is the final distribution of income, i.e., after income tax and redistribution transfers, for each alternative. This allows individual attitudes towards income distributions to be elicited without any reference to tax progressivity, i.e., the form of the social welfare function they seek to maximize.

Information about *average* tax rates is made available in the second treatment, called INFOTAXRATES. The order of information is the following. First, it has been clearly indicated that “alternative policies entail taxing citizens of Type II and/or III in order to help citizens of Type I.” Second, respondents were provided with a table showing the average tax rates that taxpayers of Type II and III face. Lastly, final income distributions were displayed in a table, just after the following statement: “Given the effects of taxation on the number of hours worked by citizens, the monthly income in euros after taxes and redistribution of each type according to each policy is...” It is worth noting that the survey timing was as follows: (1) respondents had to evaluate alternative policies in the MININFO treatment and (2) once the first stage was finished, they were given the INFOTAXRATES treatment. Thus, there was no chance that information about the tax scheme was known from the first stage.

Respondents were not provided with information about *marginal* tax rates, which has an effect on the effort made by workers. This choice can be justified on the following grounds. First, progressivity is defined as the increase in the average tax rate with respect to gross income. Second, the task would be too demanding in cognitive terms. Indeed, the concept of a marginal tax rate is not self-evident (in particular, for students who are not used to paying income tax).

Respondents were not provided with the average tax rate faced by the poorest taxpayers. The main reason for this is that a negative rate could be unfamiliar and perceived as strange by participants. Again, it would needlessly affect the perception of the choice problem. However, some comments could be made. First, it is likely to push respondents to pay attention to the gradient of average tax rates between Types II and III. However, if respondents consider the the gradient of average tax rates between Types I and II, it might affect how they evaluate tax schemes. For instance, consider policies D and E. The difference between Types I and II is lower under policy E than policy D but D is considered less progressive than E when focusing on the top. If participants calculate the gross incomes, then this ambiguity is likely to reduce the proportion of subjects exhibiting a preference for tax progressivity.

A potential limitation of this design is related to its within-respondent feature. In particular, respondents may overreact to the addition or saliency of newly available information, which can be considered as a kind of demand effect (Zizzo, 2010). To ensure that changes in preferences are not driven by the mere fact of providing a new information piece, I ran a “robustness” survey experiment, in which respondents only see the INFOTAXRATES treatment, as it is presented above (*Information* questionnaire). In this way, they are not confronted with the addition of a new piece of information. To test the robustness of the preference for progressive taxation (if any), I will thus compare the choices made by respondents in the MININFO treatment with the ones made by respondents of the robustness experiment in the INFOTAXRATES treatment. This clearly amounts to make a between-respondent comparison. The effect of providing new information piece is captured by the difference in choices made in the INFOTAXRATES

treatment between respondents of the main study and respondents of the *Information* one.

As formulated, the main survey elicits the participants' judgment of tax fairness. This may differ from their preferences over tax schemes. To establish whether people care about tax fairness when judging policy, I ran an additional survey that differs from the main one with respect to the question that participants are asked to answer (*Choice* questionnaire). More precisely, the question is:

“Imagine you are in a position of decision-maker for this society. Please indicate which policy you would choose to implement.”

It is worth mentioning that participants are asked to *choose* among the available policies but not to give the one they *prefer*. The main reason is that the idea of “preference” may be difficult to grasp for people and could be interpreted in different ways. In particular, it is likely that some participants would interpret preference as fairness judgment.

If participants are assumed to be choosing the option they prefer, this question elicits their preference over tax policies. The absence of significant differences between the main survey and this robustness one would suggest that people tend to choose the option they consider as the fairest one. As a consequence, it would mean that preference over tax policy is mainly motivated by preference over fairness views. To confirm this interpretation, questions about the reasons of their choice are added in the survey after both choice tasks. More precisely, the participants were invited to indicate (1) if they chose the policy that they consider as the fairest one and (2) if any factors other than the fairness or unfairness of policies affected their choice, and if so, which ones (they can freely mention between 1 and 3 of these factors).

### 3.2 Sample and procedures

The survey experiments were conducted on 347 respondents from two pools of respondents: users of the main Public Library in Rennes and students in their second year of economics at the University of Rennes 1. I excluded from the analysis respondents who (at least once) gave the same rank to two or more policies (e.g., policies A and B are both ranked second) or who gave ‘dubious’ rankings.<sup>9</sup> In the end, 339 respondents gave ‘valid’ patterns of answers. The 166 respondents from the Public Library participated in the main survey experiment. The remaining 170 are from the pool of students in economics: 71 of them participated in the Main survey experiment, 48 in the Information one and 51 in the Choice one. Table 4 presents a brief description of the pool of respondents. The Public Library pool of respondents is, by nature, more diverse in terms of age<sup>10</sup> and occupation. This sample is mildly more politically left-oriented than the student sample.<sup>11</sup>

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<sup>9</sup>A typical example of a dubious ranking is the case where policy A is ranked first, policy B is second, ..., policy E is fifth (or the reverse). This was only the case for 6 respondents.

<sup>10</sup>In the city of Rennes, 51.8% of the population is under 29 years old.

<sup>11</sup>A  $\chi^2$  test rejects the hypothesis of homogeneity of left/center/right distribution across the samples:  $p = 0.001$ . However, using  $\chi^2$  tests, we can reject the possibility that the proportion of answers from the left is the same in the Main and Choice experiments ( $p = 0.052$ ) and in the Information and Choice experiments ( $p = 0.019$ ). The political preferences of the samples are close to that of the city, as measured by the results of the last presidential elections: in the city, the leftwing candidates garnered 41.2% of the votes, 31.86% of voters chose the centerist candidate (Emmanuel Macron), and the rightwing ones obtained around 25.6%.

Sample:	Public Library		University	
Questionnaire:	Main	Main	Information	Choice
No. of responses	166	71	48	51
Female	57.58%	45.07%	66.67%	52.94 %
Mean age	30.06	19.54	19.31	19.24
≤29 years old	51.8%	97.26%	100%	100%
Occupation				
Student	49.52%	100%	100%	100%
Employed	35.92%			
Unemployed	10.18%			
Retired	3.59%			
Political preference (scale between 1 and 9)				
Mean value	4.20	4.78	4.81	5.05
Left (≤ 4)	42.77%	43.66%	50.00%	26.42%
Center (= 5)	37.35%	21.13%	18.75%	32.08%
Right (≥ 6)	19.88%	34.21%	31.25%	41.51%

Table 4: Sample description

The Public Library part of the study was conducted in June 2015. The users of the public library were *individually invited* by an ‘experimenter’ to participate in a survey on social justice and redistributive policies. If individuals accepted, the experimenter then explained the topic and general instructions of the survey to them. Respondents were invited to pay particular attention to the fact that there was no ‘right’ answer and the objective of the survey was to investigate their personal opinion. They then read the different scenarios for themselves and answered the survey, while the experimenter was free to answer any questions in case of misunderstandings or difficult questions. All the rooms in the public library where the survey was run are quiet.

The questionnaire experiment was run at the Faculty of Economics of the University of Rennes 1 in November 2015 (the Main questionnaire), in February 2017 (the Information questionnaire) and in January 2019 (the Choice questionnaire). All surveys were conducted with undergraduates taking microeconomics classes, during class time. In order to allow a comparison with the Public Library sample possible, I tried to use the same procedure insofar as was possible. The general instructions were read out loud by the experiment organizer but the scenarios were read individually by participants, minimizing the difference from the Public Library sample. Next, students answered the survey and were free to ask any questions to the experimenter. Despite the context of the classroom experiment, participation was voluntary and anonymous. Completion of the survey lasted between 10 and 20 minutes depending on the version.

## 4 Hypotheses: Typology of Attitudes

A typology of individual attitudes may be introduced based on the theoretical framework and the survey design. To do this, in this section and the main empirical analysis (next section), I focus on the policy that is judged to be the fairest or that is chosen by the respondent. The analyses of the complete ranking of policies (Condorcet method and Borda score) are reported in the appendix (Appendix A and B).

The first type of attitude states that respondents' judgements or choices are in line with the traditional view found in the optimal taxation literature: the optimal taxation scheme is the one that leads to the preferred final income distribution. Generally speaking, if the respondent is consequentialist, then the ranking of policies should be the same irrespective of the informational treatment. A alternative definition may be formulated as follows:

**Attitude 1 (Consequentialist view)** *If the respondent is consequentialist, then the fairest/chosen policies should be the same irrespective of the informational treatment.*

However, one cannot ascertain *with certainty* that a respondent who reports the same ranking of taxation schemes in all the treatments is purely consequentialist. For instance, it is possible that the decrease in the total social welfare is judged to be too large to prefer progressive taxation.

The opposite attitude is the procedural view of fairness according to which the shape of the tax function matters. The respondent has a procedural view of fairness if her ranking of policies varies with the informational treatment.

**Attitude 2 (Procedural view)** *The respondent has a procedural view of fairness if the fairest/chosen policies varies with the informational treatment.*

The ways in which a respondent's ranking varies with information gives an indication about her attitude towards progressivity. The respondent has a preference for progressive taxation if there are two policies  $i$  and  $j$  such that  $i$  is less progressive than  $j$ , and she has a preference for  $i$  over  $j$  in the MININFO treatment and a preference for  $j$  over  $i$  in the INFO TAX RATES treatment. A simpler but stronger definition might be stated as follows:

**Attitude 3 (Preference for Tax Progressivity)** *The respondent has a preference for progressive taxation if the fairest/chosen policy is more progressive in the INFO TAX RATES treatment than the fairest/chosen one in the MININFO treatment.*

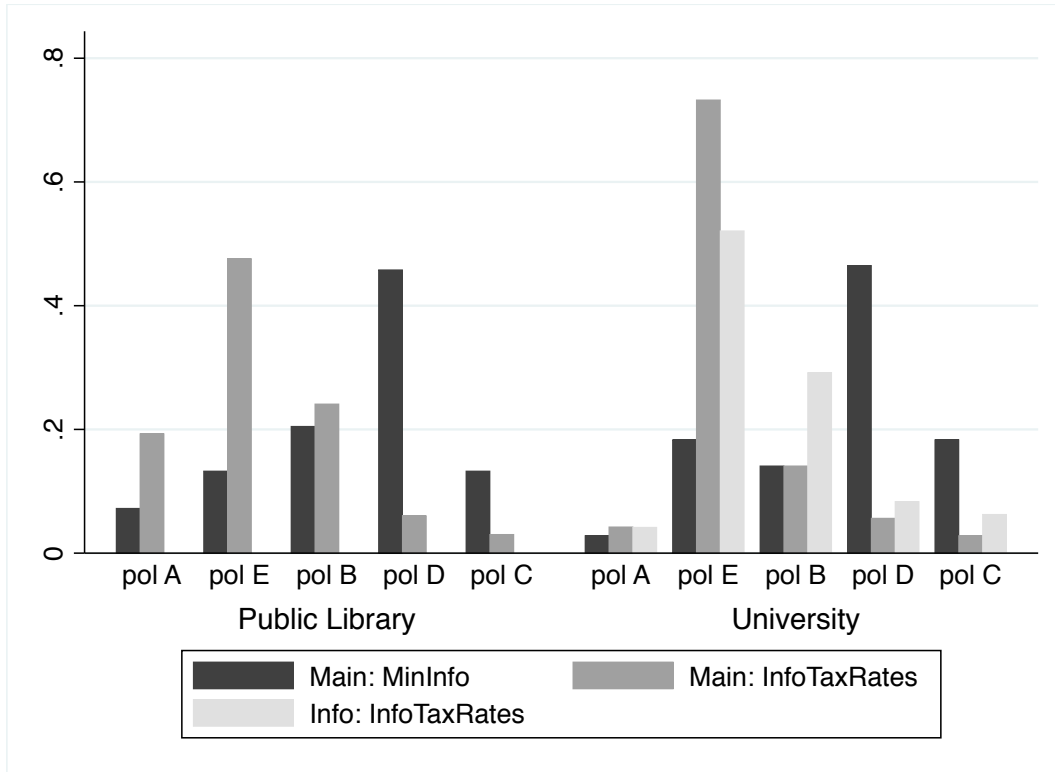
## 5 The Evidence for a Preference for Tax Progressivity

This section first provides the main evidence that respondents are not consequentialist and exhibit preferences for implementing progressive taxation. I then present the results of the two robustness experiments. In the subsequent statistical analysis, only non-parametric tests are reported and all the regression results are reported in the Appendix C.

## 5.1 Aggregate ranking of taxation schemes

The first finding concerns the aggregate ranking of tax policies in the two treatments of the main survey experiment. It can be summarized as follows:

**Result 1** Progressive taxation schemes are more popular for the participants when they have information about average tax rates.



This graph displays the repartition of subjects regarding the policy they consider as the fairest one, in the *Main* and *Information* questionnaires.

Figure 1: The fairest policy, fraction of respondents (*Main* and *Information* questionnaires)

Figure 5 shows the choice of the fairest tax policy among respondents and Table 5 displays the  $p$ -values of McNemar tests when the null hypothesis is that the proportions of respondents preferring policy  $j$  are equal in the two informational contexts. Overall, regressive taxation schemes (policies D and C) are more likely to be considered as the fairest by the respondents, when they are not provided with information about average tax rates. By contrast, progressive taxation (policies A and E) is more popular if average tax rates are known. In the MININFO treatment, the largest proportion of respondents (around 45% of them) judge policy D to be the fairest option, while about 20% of them select E or A.<sup>12</sup> In the INFOTAXRATES treatment, respondents have a clear preference for progressive taxation schemes, i.e., policies A and E. In both samples, 90% of respondents choose one of the three non-regressive tax schemes, and two thirds

<sup>12</sup>The choice of D as the fairest option seems to be a compromise between a purely Rawlsian objective and egalitarian motives (this result is in line with that of Schwettmann, 2012).

	Public Library	University
policy A (Highly prog)	<0.001	0.6547
policy E (Prog)	<0.001	<0.001
policy B (Prop)	0.4461	1.000
policy D (Reg)	<0.001	<0.001
policy C (Highly reg / R)	0.001	<0.001

This table displays the results of McNemar tests ( $p$ -values) for the comparison of proportions of respondents considering policy  $j$  as the fairest one for each policy between in the MININFO and INFOTAXRATES treatments. The null hypothesis is that the proportions of respondents preferring policy  $j$  are equal in the MININFO and INFOTAXRATES treatments.

Table 5: The fairest policy: Difference between treatments

of them select strictly progressive taxation (policies E and A). Finally, the proportion of respondents choosing policy B as the fairest one is the same in both treatments.

*Robustness.* As shown in Appendices A and B, the conclusions drawn from the fairest policy are found to be robust if the Condorcet and Borda rankings are used. As for the difference between samples, the econometric analysis detailed in the Appendix C (see Tables 16 and 18) reveals that there is no difference between samples (Public Library or University) in terms of choice of the fairest policy and Borda scores. Nevertheless, there is a significant difference between students and other respondents according to the Borda score. In particular, the former seems to be more consequentialist in the sense that the scores given in the two treatments are *more* correlated for the students than for the other respondents.

## 5.2 Change in respondents' preference with information availability

I will now examine the change in reported preferences at the individual level. The main result may be summarized as follows:

**Result 2** A large majority of respondents exhibit a preference for progressive (or non-regressive) taxation.

Tables 6(a) and (b) show the matrix of preference changes between informational contexts for both samples. Table 7 summarizes these data: the proportions of respondents who ‘choose’ the same policy in the MININFO and INFOTAXRATES treatments, of non-consequentialist respondents (i.e., respondents who changed their views when they were informed about average tax rates) and of respondents who choose more progressive taxation in the INFOTAXRATES treatment. I also report the results of binomial tests ( $p$ -value) for the null hypothesis that the proportion of “Same choice” (“More progressivity”) answers is equal to 0.5.

Almost all subjects preferring policies D and C (the least progressive) in the MININFO treatment appear to prefer more progressive policies in the INFOTAXRATES treatment. For instance, 75% of the University’s respondents (25 out of 33) and 55% of Public Library’s respondents (42 out of 76) prefer D in terms of the final distribution but consider E as the fairest policy when information about average tax rates is provided. Considering the whole sample, around 18% of respondents choose the same policy in both frames and 71% of them choose a more progressive taxation policy when they were given information

		Preferred policy in INFOTAXRATES treatment							
		Policy A	Policy E	Policy B	Policy D	Policy C	All		
Preferred policy in MININFO treatment	Policy A	0	2	0	0	0	2	(2.81%)	
	Policy E	1	9	2	1	0	13	(18.31%)	
	Policy B	0	9	1	0	0	10	(14.08%)	
	Policy D	1	25	5	2	0	33	(46.48%)	
	Policy C	1	7	2	1	2	13	(18.81%)	
	All	3	52	10	4	2	71		
		(4.23%)	(73.24%)	(14.08%)	(5.63%)	(2.81%)			

(a) University's respondents

		Preferred policy in INFOTAXRATES treatment						
		Policy A	Policy E	Policy B	Policy D	Policy C	All	
Preferred policy in MININFO treatment	Policy A	4	4	4	0	0	12	(7.23%)
	Policy E	3	13	5	0	1	22	(13.25%)
	Policy B	7	15	6	3	3	34	(20.48%)
	Policy D	11	42	16	6	1	76	(45.78%)
	Policy C	7	5	9	1	0	22	(13.25%)
	All	32	79	40	10	5	166	
		(19.28%)	(47.59%)	(24.10%)	(6.02%)	(3.01%)		

(b) Public Library's respondents

Each cells in these tables displays the number of respondents who prefer the policy of that row in MININFO treatment and the policy of that column in INFOTAXRATES treatment.

Table 6: Transition matrices – *Main* questionnaire

	Preferred policy in MININFO treatment					
	All	policy A	policy E	policy B	policy D	policy C
The same preferred policy	18.14	28.57	62.86	15.91	7.34	5.71
Procedural	81.86	71.43	37.14	84.09	92.66	94.29
Pref. for more progressivity	71.49	.	11.43	70.45	91.74	94.29
$N =$	237	14	35	44	109	35
Binomial tests ( $p$ -value)						
$H_0 : \Pr(\text{Same choice})=0.5$	<0.001	0.1796	0.1755	<0.001	<0.001	<0.001
$H_0 : \Pr(\text{More prog})=0.5$	<0.001	.	<0.001	0.0096	<0.001	<0.001

This table displays the change in the preferred taxation schemes when information about average tax rates is provided to respondents. “The same preferred policy” means that respondents choose the same policies in MININFO and INFOTAXRATES treatments as the fairest policy. Respondents are said to be “Procedural” if their choices of the fairest policy vary with information availability. “More progressivity” means that a respondent selects a more progressive taxation policy in the INFOTAXRATES treatment.

Table 7: Change in the fairest policy chosen by respondents (%)

about tax rates. However, more than 90% of respondents selecting policies D and C in the absence of any information about the tax function changed their preference once they knew the average tax rates. It should also be noted that almost all respondents switched to more progressive taxation: about 92% of respondents choosing D in the MININFO treatment preferred greater progressivity in the INFOTAXRATES one.<sup>13</sup> Respondents who declared preferring policy B in the MININFO treatment were less likely to change their views than the ones preferring policy D or C.<sup>14</sup> Nevertheless, about 70% of respondents decided to switch to more progressive taxation. Finally, it is more difficult to infer robust conclusions about respondents who prefer policies A and E in the MININFO treatment due to the low number of responses. It may be noted that a significant proportion of respondents who prefer E with minimal information decided not to change their views.

*Robustness.* The analysis of changes in the individual Borda score is presented in Appendix A.2. It also gives a supports a preference for tax progressivity.

### 5.3 Robustness to receiving a new information

In order to test whether the change in respondents’ preferences was not due to the mere fact of providing information about average tax rates, I study how respondents facing the *Information* questionnaire (i.e., answering only the INFOTAXRATES treatment) rank policies compared to respondents from the main survey. It is found that the taste for progressive taxation appears to be robust even if there is an effect of providing new information on preferences reported by respondents.

The right panel of Figure 5 displays the fairest policy, which respondents of the *Main* questionnaire chose when they face the MININFO and INFOTAXRATES treatments, and the one selected by respondents of the *Information* questionnaire facing the INFOTAXRATES treatment. Table 8 reports the results of

<sup>13</sup>It should also be noted that, among respondents who preferred C in the MININFO treatment, only 4 of them (11%) selected D or C in the INFOTAXRATES treatment: i.e., rather than choosing a less regressive scheme, they choose progressivity.

<sup>14</sup>A homogeneity chi-squared test indicates that the difference is statistically slightly significant ( $p = 0.070$ ).



the non-parametric tests for the effect of providing information. It turns out that preferences reported by respondents who only face the `INFOTAXRATES` treatment seem to be “closer” than the preferences reported by the main survey respondents in the `INFOTAXRATES` treatment than in the `MININFO` one. The between-respondent comparison (column 3 of the Table 8) tends to provide evidence for a taste for tax progressivity. Indeed, policies E and D are significantly more attractive in the `INFOTAXRATES` treatment than the `MININFO` one. However, it also seems that there is a small effect of providing a new information (column 2 of Table 8). Policy E seems to be less attractive in view of the respondents’ opinion in the main study, while policy B is chosen more as the fairest option.

*Robustness.* Appendix A.3 reports the results with mean Borda scores for each policy and Appendix C.2 reports the estimates of a regression analysis. Both shows the robustness of the initial finding, i.e., people exhibit a preference for tax progressivity.

	<i>Main vs Information</i> questionnaires	
	Providing a new info.	Between-resp. test
Policy A (Highly prog)	0.988	0.689
Policy E (Prog)	0.018	<0.001
Policy B (Prop)	0.044	0.044
Policy D (Reg)	0.564	<0.001
Policy C (Highly reg / R)	0.360	0.059

This table reports the  $p$ -values using  $\chi^2$  homogeneity test. The first column tests the null hypothesis that the proportion of respondents preferring policy  $j$  in the `INFOTAXRATES` treatment is the same for both questionnaires. In the third column, the null hypothesis is that the proportion of respondents preferring policy  $j$  in the `INFOTAXRATES` treatment in the *Information* questionnaire is equal to that of respondents preferring policy  $j$  in the `MININFO` treatment in the *Main* one.

Table 8: Robustness to information saliency: Statistical tests ( $p$ -value)

## 6 Judgements of fairness or judgements of tax policies

In the previous section, it is shown that people attach a value to tax progressivity when they are asked to judge tax policies in terms of fairness. However, this does not imply that people would choose the progressive taxation. In this section, I analyze whether the results of the *Choice* questionnaire. More precisely, I study if participants have a preference for tax progressivity when they are asked to choose between policies and if their choices are similar depending on whether they are asked to choose between policies or report the fairest one.

Do respondents exhibit a preference for tax progressivity when choosing between policies? The results may be summarized as follows:

**Result 3** When participants are asked to choose between policy, they exhibit a preference for progressive taxation.

Table 9 reports the choice made by participants in each informational context. First, participants

		Chosen policy in INFOTAXRATES treatment						All
		Policy A	Policy E	Policy B	Policy D	Policy C		
Chosen in treatment	policy	Policy A	0	0	0	0	0	0 (0%)
	MININFO	Policy E	0	4	0	0	0	4 (7.55%)
		Policy B	0	3	1	1	0	5 (9.43%)
		policy D	0	21	0	6	1	28 (52.83%)
		Policy C	0	8	6	2	0	16 (30.19%)
	All	0 (0%)	36 (67.92%)	7 (13.21%)	9 (16.98%)	1 (1.89%)	53	

Each cells of these tables displays the number of respondents who choose the policy in row in MININFO treatment and the policy in column in INFOTAXRATES treatment.

Table 9: Transition matrices – *Choice* questionnaire

are found to be more likely to choose a progressive taxation in the INFOTAXRATES treatment than in the MININFO treatment. The proportion of participants who choose D or C is more than 80% (44 participants) when being given information about final incomes, while this proportion is about 18% (10 participants) when information about tax rates is also provided (McNemar tests conclude that the numbers of participants opting for regressive taxation is statistically different in the two treatments for both policies:  $p < 0.001$ ). On the contrary, 69% of participants (36 participants) choose policy E in the INFOTAXRATES treatment against 7% (4 participants) in the MININFO treatment ( $p < 0.001$  with a McNemar test). It is also found that the number of participants who chose policy B is the same in both treatments ( $p = 0.5271$ , McNemar test).

Second, Table 9 shows that a majority of subjects change their choice once they receive information about average tax rates. It is found that 75% of participants (40 out of 53) could be considered as having a preference for tax progressivity since they opt for a more progressive scheme once information about tax rates is given. Only 21% of them (11 participants) make the same choice in both informational contexts. Focusing on respondents who choose D in the MININFO treatment, 75% of them (21 out of 28) choose a progressive scheme (namely, policy E). All subjects having that choose C in the MININFO treatment choose a more progressive taxation when tax rates are revealed, and only 2 out of 16 choose policy D.

Do their choices vary depending on whether they are asked to choose between policies or rank policies in terms of fairness? When comparing the answers given by participants facing the *Main* and the *Choice* questionnaires, answers given by the respondents are quite similar. Indeed, the proportion of respondents choosing policy  $j$  (in the *Choice* experiment) is generally similar to the proportion of respondents selecting policy  $j$  as the fairest one (in the *Main* experiment), for both informational treatments. Table 10 reports the  $p$ -value of the  $\chi^2$  homogeneity test for each policy and informational treatments. The only statistically significant differences are for policy D in the INFOTAXRATES treatment (at 5%) and policy D in the MININFO treatment (at 10%). Respondents are also found to exhibit a preference for tax progressivity in the same proportions. Using  $\chi^2$  homogeneity tests, we can not reject the hypothesis that the proportion of respondents who select a more progressive policy in the INFOTAXRATES treatment is the same for the two questionnaires ( $p = 0.8868$ ). The same conclusion is found for the proportion of respondents who

select the same policy in the informational context ( $p = 0.4559$ ).

	policy A	policy E	policy B	policy D	policy C
MININFO treatment	0.2180	0.0848	0.4321	0.4840	0.1221
INFOTAXRATES treatment	0.1298	0.5189	0.8883	0.0413	0.7388

This table reports the  $p$ -value of the  $\chi^2$  homogeneity test for each policy and informational treatments, when the null hypothesis is that the proportion of respondents selecting  $j$  in the main survey experiment is equal to those in the Choice survey experiment.

Table 10: Difference between *Main* and *Choice* questionnaires

One interpretation of the absence of difference is that people choose the policy that they consider the fairest one. To confirm this interpretation, questions about the reasons of their choice might be worthwhile. In particular, respondents have to indicate if they chose the policy that they consider as the fairest one. It appears that 90% of them (47 out of 52) report that “they chose the policy that they considered as the fairest one” when they have information about final incomes and tax rates. Moreover, 82% of them (42) do not seem to consider anything other than the fairness or unfairness of policies.

## 7 Discussion

This section discusses issues related to the empirical methodology and the interpretation of the results.

*Methodological issues.* In the experimental design, the variation in relevant information is used to get a more accurate picture of the respondents’ preferences and motivations (see also Faravelli, 2007; Schwettmann, 2012). Studying change in the respondents’ preferences with information availability helps to elicit the weight they assign to the different arguments of their social choice function. However, with an intra-respondent design, there are two potential limitations. First, respondents can “overreact” to the addition of new information. Indeed, the new information (given in the richer informational context) is more *salient* since respondents have already assimilated all the other information (presented in the poorer informational context). In addition, if respondents have limited cognitive ability to handle context with too much information, they are likely to evaluate taxation schemes on the basis of this new information (i.e., average tax rates). Second, our results might be affected by a training effect. For instance, participants may have the opportunity to think about the situations more deeply and have a more precise view of their judgements. In other words, if they had thought enough during the first treatment, they might have ranked the alternatives in the same way as in the subsequent treatment. The analysis of the preferences given by respondents who do not experience the addition of new information (robustness experiment) shows that such effects may exist but do not undermine the fact that they have a preference for progressive taxation schemes over regressive ones.

*Validity of the results.* The main result is that a majority of respondents have a preference for progressive taxation, in the sense that the welfarist-maximizing scheme (the one selected when only information about final incomes is provided) is not considered as the fairest scheme in the richer informational treatment (when average tax rates are known). This means that they accept a sacrifice in terms of total utility in exchange for tax progressivity. Thus, the taste for progressive taxation does not simply translate a

classic trade-off between efficiency and equity,<sup>15</sup> but rather reveals that tax progressivity is judged as a *desirable* property of taxation.

An initial issue is related to a potential circularity in the findings, i.e., the fact that (French) respondents tend to select progressive models may not reveal that they have a ‘genuine’ preference for progressivity. Rather, since French income taxation is progressive and tax progressivity is often at the center of public debate, regressive taxation may seem unfamiliar to respondents. As such, they are likely to reject this form of taxation even if it leads to a preferred final distribution. Such a preference might be rooted in a *status quo* bias that pushes them not to choose a better option. Alternatively, the current form of income tax model may influence their judgements and the judgements they think they should have (‘if the current tax regime is progressive, there must be a good reason’).

A related issue is the external validity of the results. First, a part of the sample consists of economics students. Such a choice is mainly motivated by the fact that it is easier for these respondents to complete this type of ‘exercise’. However, if we assume that such respondents are likely to be consequentialist because of either learning or a selection hypothesis,<sup>16</sup> it might reinforce the main result. However, it should be noted that I did not find any difference between economics students and other respondents (see Table 16 in Appendix C). Second, it is likely that French respondents have a stronger preference for tax progressivity than American or Japanese people. In light of this, it would be worth conducting the same type of study in different countries in order to explore this issue and evaluate the external validity of the results.

*Interpretation of the results.* Is it possible to conclude that the value attached to tax progressivity is *intrinsic*? Or, do people believe that tax progressivity is a means of implementing a “superior” principle of taxation? Some ethical motivations for progressivity exist and a natural candidate is the equal sacrifice principle that was originally put forward by John Stuart Mill. This principle states that all taxpayers should experience the same loss of utility. As the theoretical literature shows, equal sacrifice can justify the implementation of a progressive tax model.<sup>17</sup> It is also possible that respondents evaluate taxation schemes on the basis of their ability to reduce inequality. As Jakobsson (1976) shows, the post-tax income distribution is more equal than the pre-tax one (according to the Lorenz criterion) if, and only if, taxation is progressive. This suggests that the value of tax progressivity lies in the decrease in inequality, more than being a desirable property about sharing the tax burden.

According to another interpretation, respondents are willing to punish the rich or the most talented individuals for reducing their work effort in response to taxation insofar as such a behavior is perceived as free riding. There is now widespread evidence in experimental economics that people punish free-riding behavior and deviations from social norms even if the act of punishment is costly (see, for instance, Fehr and Gächter, 2002). Furthermore, they seem to judge such behavior as not being morally neutral. Cubitt et al. (2011) report the results of an experimental survey in which respondents are asked to evaluate the morality of free riding in a (hypothetical) public goods game. Their subjects are found to condemn

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<sup>15</sup>If this were the case, the ranking of final income distributions would capture it.

<sup>16</sup>The difference between economists and non-economists is the object of debate: See, for instance, Frank et al. (1993), Frey and Meier (2003), Fehr et al. (2006), Rubinstein (2006) or Faravelli (2007).

<sup>17</sup>See for instance Young (1987, 1988, 1990); Berliant and Gouveia (1993); Ok (1995), or Moyes (2003).

free riding (even though their perception depends on other peoples' behavior). In the context studied in this paper, selecting a higher tax rate on the highest incomes is the means used to punish the richest individuals for not contributing to income redistribution or for not assisting the worst-off individuals in society.

More generally, the dilemma explored in these survey experiments echoes the debate about the role and the moral evaluation of material incentives. The desire for implementing progressive taxation may be an illustration of the relative reluctance to accept the general prescriptions based on incentives made by the economists “more progressivity is not optimal due to the presence of a disincentive effect on work effort”). Bénabou and Tirole (2011) argue that such prescriptions are perceived as “bad news about human nature and behavior.” Following their intuitions, a preference for progressivity might be grounded on the resistance to the incentive argument, which is itself explained by an aversion to bad news and the preference for pleasant illusions (“work disincentive from labor taxation and tax evasion do not exist”). This means that people may be consequentialist but their own psychological failures prevent them from acting as such.

In an alternative view, the results shed light on the fact that people may not perceive material incentive constraints (e.g., a decrease in work effort) as *exogenous*. The belief that constraints driven by selfish utility maximization are not immutable is defended by scholars including Cohen (1991) and Roemer (2012). Roemer (2012) points out that “there is an important difference between technological constraints on the one hand and informational constraints and psychological propensities on the other. For it is useful to imagine, from the normative viewpoint, a transformation of preferences into selfless ones; it is not ethically interesting, however, to imagine as a normative exercise a world with much greater technological knowledge” (p. 292).<sup>18</sup> It is not obvious how the belief about the morality of individual actions affects the rankings of taxation schemes. On the one hand, a regressive policy that maximizes the minimum income may not be judged as the fairest because it allows high-ability workers to adopt immoral actions. On the other hand, if one is sufficiently averse to inequality, such a policy should be chosen from the available options as the minimum income is maximized, even if it cannot be judged as the fairest.<sup>19</sup>

Overall, these issues do not undermine the finding that respondents have a preference for implementing progressive taxation. Rather, it is not clear whether tax progressivity has an intrinsic value or is grounded in a willingness to implement a higher principle of taxation.

*Comments by respondents.* After the fairness ranking tasks, the (student) respondents were invited to provide some justifications for their choice. These comments may be useful in identifying their motivations.<sup>20</sup> Here, I present the main conclusions that can be drawn; Appendix D provides more details. First, a large majority of respondents (more than 80% of them) suggest a concern about the distribution

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<sup>18</sup>Thus, some rules of behavior may exist that could be considered as more moral: in a situation where members of a community share a social ethos, an increase in the marginal tax rate is expected to have a small, or even non-existent, effect on their work effort. See Boadway et al. (2007) or Roemer (2015) for theoretical exploration of ethical or Kantian behavior.

<sup>19</sup>In a similar vein, Kolm (1971) makes the difference between choosing the best policy from the feasible and incentive-compatible options (*practical justice*) and from the feasible options (*justice*).

<sup>20</sup>The discussion of experimental results in the light of the written comments given by respondents or the declared motivations for their choices is not common in experimental economics but there are some exceptions: See Cowell et al. (2015) or Tavoni et al. (2011).

of the tax burden and, for more than 50% of them, the mere support for tax progressivity is given (comments such as “the richest should be taxed more than the middle class”). Second, the concern about the post-tax distribution of income is mentioned by 20% of respondents. Third, it seems that respondents do not anticipate any positive or negative macroeconomic effect of progressive taxation (on growth or unemployment for instance). Fourth, if the comments seem to confirm that progressive taxation is perceived as fairer than other forms of taxation, they do not allow for discriminating between the roots of this judgment (intrinsic value, equal sacrifice or willingness to punish the richest for non-cooperation). More research is needed to understand the motivations for implementing tax progressivity and to explore the link between people’s judgments about public policies and their belief about the morality of incentives.

## 8 Conclusion

The desire to implement progressive income taxation may have two motivations. First, tax progressivity may have a consequentialist virtue in that it allows inequality and poverty to be reduced or leads more generally to improved social welfare. Second, it is possible to have a preference for progressive schemes independently of the final situation: In particular, progressivity may be perceived as a desirable principle of *fair* taxation. The main assumption of the Mirrlees’s theory of optimal taxation is that a social planner should choose the scheme that maximizes the sum of individual utilities (or another form of social welfare depending on the final incomes). As a consequence, the existence of informational and incentive constraints means that an increase in progressivity is not always socially desirable.

This paper aims to investigate the empirical support of this assumption of consequentialism in the choice of taxation and its implication for the value of tax progressivity. To do this, I conducted survey experiments in which respondents were asked to rank or choose between redistributive policies in different informational contexts: (i) when only information about final incomes was provided, and (ii) when they were *also* informed about average tax rates. The change in respondents’ preferences between (i) and (ii) reveals whether or not they are consequentialist and how they value tax progressivity. It turns out that in the treatments (i) and (ii), the majority of the (French) respondents did not consider the utilitarian-maximizing scheme (the one chosen in treatment (i)) to be the fairest choice and opted for a progressive (or non-regressive) taxation policy, revealing that they have a preference for implementing a progressive taxation scheme.

The findings reported in this paper contribute to the existing literature about normative judgements. First, in recent empirical researches on “positive optimal taxation”, people are found to be reluctant to endorse a consequentialist view. On the contrary, it seems that the pre-tax incomes matter in their judgments and rules like equal sacrifice and benefit approaches may be supported (Weinzierl, 2014; Charité et al., 2015; Saez and Stantcheva, 2016). My paper suggests that the way in which the tax burden is shared between individuals matters and, in particular, tax progressivity may be a desirable means of raising tax revenues. Second, it seems that preference for tax progressivity is not grounded in consequentialist considerations (utilitarian objective or priority for the worst-off).<sup>21</sup>

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<sup>21</sup>As it is pointed out in the introduction, Gaertner and Schwettmann (2017) pay attention to how additional tax burden has to be shared and find that progressive schemes are perceived as fairer than proportionality. Compared to their paper,

There are some interesting extensions for future research. As discussed in the previous section, it would be interesting to study whether preference for tax progressivity is intrinsic or a means of implementing a higher principle of taxation, such as equal sacrifice. Since these survey experiments indicate that people tend to attach a non-consequential value to tax progressivity, another topic would be to estimate the *weight* they attach to the different values: i.e., the final situation and tax progressivity. An interesting instance is the comparison between a progressive scheme and a *more* progressive one: Which *level* of loss in total utility do people accept in exchange for more progressivity? Do they have a preferred level of progressivity in mind? Or, do they select the best policy in the set of admissible taxation schemes? Finally, respondents are told that difference in skill is solely due to difference in family background, i.e., a variable which is beyond their control. It would be interesting to investigate people's attitudes toward tax progressivity in a context where inequality in gross income is also or solely explained by work effort for which individuals are responsible.

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my experimental study elicits judgements about taxation schemes in a more general context (redistribution) and explores whether or not they are grounded on consequentialist considerations (utilitarian or priority on the worst-off).

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# Online appendix

## A Borda scores

### A.1 Aggregate ranking

Figure 2 presents the mean Borda score of each policy in both treatments and provides the results of the Wilcoxon tests ( $p$ -value).<sup>22</sup> Again, it appears that regressive taxation schemes are significantly less attractive to respondents while progressive ones are more attractive in INFO TAX RATES treatment than MIN INFO one. For the pooled samples, when information about average tax rates is provided, the mean Borda scores for D and C decrease from 2.91 and 2.21 to 1.90 and 0.55 respectively. On the other hand, policies A and E have significantly higher Borda scores when information about tax rates is provided: the mean values taken by Borda scores is about 0.67 and 1.77 in the MIN INFO treatment, and 2.08 and 3.21 in the INFO TAX RATES treatment. As for policy B (i.e., proportional taxation), it obtains the second rank but its Borda score increases when respondents obtain information about tax rates: from 2.43 to 2.68. Finally, the rankings generated by the Borda score are similar to the ones using the Condorcet method.

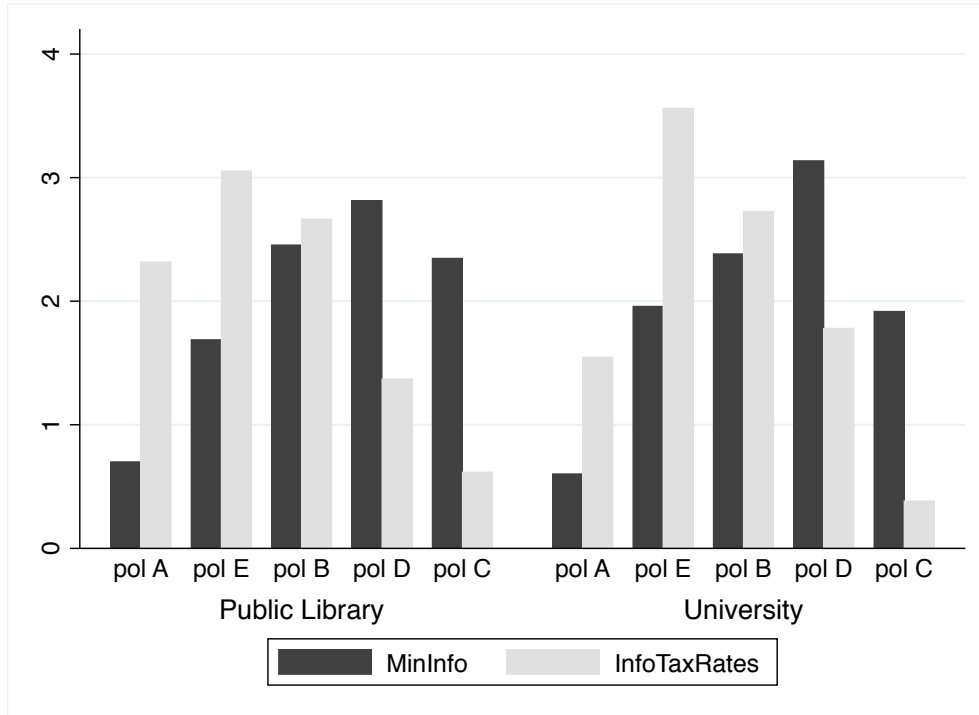
### A.2 Change in Borda scores with information availability

The analysis of changes in the individual Borda score also shows support for tax progressivity. Table 11 indicates, for each policy, the proportions of respondents who reported the same Borda score (or rank) in both treatments, of respondents who gave a better score in the INFO TAX RATES treatment, and of respondents who gave a worse score in INFO TAX RATES treatment. This shows that between 17% and 28% of respondents gave the same rank to policies, and only 4% of them (10 out of 237 respondents) chose the same ranking for all five options. Thus, there is no evidence that respondents behaved as consequentialists. Moreover, it is clear that respondents gave a higher Borda score to progressive taxation schemes when they have information about tax rates, while they gave a lower score to regressive ones.

	Policies				
	Policy A	Policy E	Policy B	Policy D	Policy C
The same Borda score (rank)	17.72	19.41	28.69	19.41	20.68
Higher Borda score in INFO TAX RATES	73.42	69.20	43.46	10.13	8.02
Lower Borda score in INFO TAX RATES	8.86	11.39	27.85	70.46	71.31
Binomial tests ( $p$ -value)					
$H_0 : \Pr(\text{Same Borda})=0.5$	<0.001	<0.001	<0.001	<0.001	<0.001
$H_0 : \Pr(\text{Higher Borda})=\Pr(\text{Lower Borda})$	<0.001	<0.001	<0.001	<0.001	<0.001

Table 11: Change in respondents' Borda scores (% of respondents)

<sup>22</sup>The Borda score given by respondent  $i$  for policy  $X$  in treatment  $\alpha$  is:  $b_{iX,\alpha} = 5 - r_{iX,\alpha}$  where  $r_{iX,\alpha}$  is the rank that  $i$  gives to policy  $X$  in treatment  $\alpha$ .



	Borda counts	
	Public Library (1)	University (2)
policy A (Highly prog)	<0.001	<0.001
policy E (Prog)	<0.001	<0.001
policy B (Prop)	0.0534	0.0367
policy D (Reg)	<0.001	<0.001
policy C (Highly reg / R)	<0.001	<0.001

This table displays the results of Wilcoxon tests ( $p$ -values) for the comparison of proportions of the mean Borda scores for each policy between in treatments MININFO and INFOTAXRATES. The null hypothesis is that the Borda scores for policy  $j$  have the same distribution in both treatments.

Figure 2: Borda scores (*Main* questionnaire): Average values and statistical tests ( $p$ -value)

### A.3 Robustness to receiving a new information

Figure 3 shows the mean Borda scores of each policy in the different treatments. Table 4 reports the results of the non-parametric tests for the effect of providing information.<sup>23</sup> The examination of the variation in Borda scores also indicates that policies A and E are significantly less attractive for the main study respondents ( $p = 0.045$  and  $p = 0.033$ , respectively with the Wilcoxon-Mann-Whitney test), while D is ranked higher even if the statistical significance is quite low ( $p = 0.070$ ). No difference is found for policies B and E.

<sup>23</sup>See Appendix C for regression results.

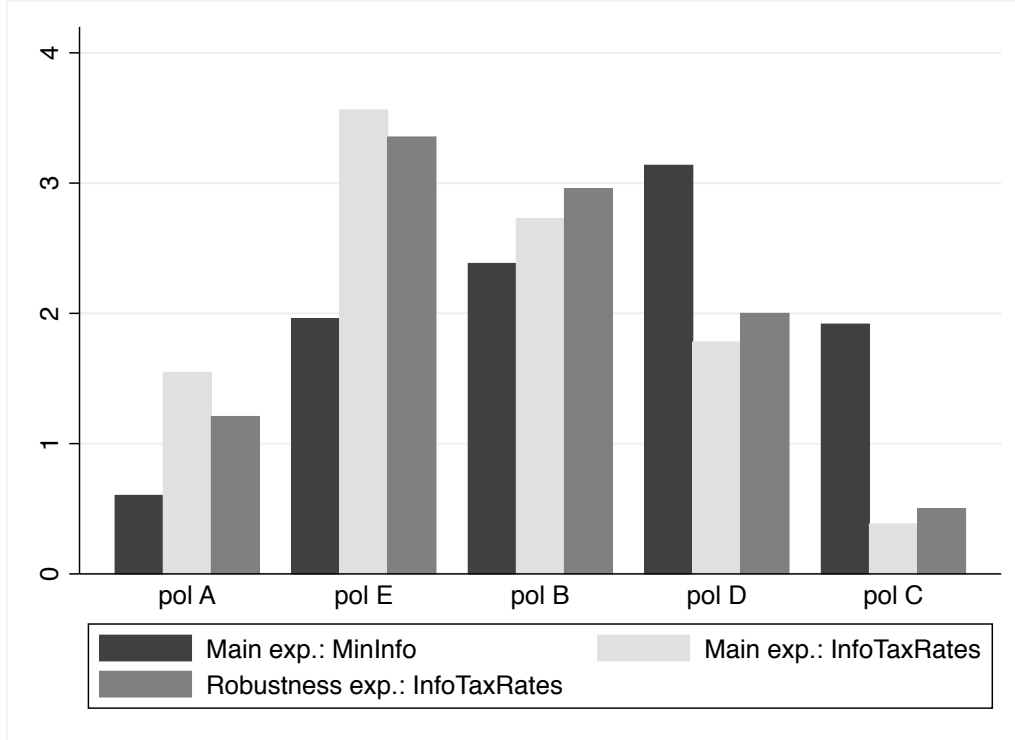


Figure 3: Mean Borda scores

	<i>Main vs Information</i> questionnaires	
	Providing a new info.	Between-resp. test
Policy A (Highly prog)	0.045	<0.001
Policy E (Prog)	0.033	<0.001
Policy B (Prop)	0.153	0.001
Policy D (Reg)	0.070	<0.001
Policy C (Highly reg / R)	0.551	<0.001

This table reports the  $p$ -values using the Wilcoxon-Mann-Whitney test.

Figure 4: Robustness to information saliency: Statistical tests ( $p$ -value)

	MININFO	INFOTAXRATES
Public Library	$D \succ C \sim B \succ E \succ A$	$E \succ B \succ A \succ D \succ C$
University	$D \succ B \succ E \succ A$	$E \succ B \succ D \sim A \succ C$
	$D \succ C \succ A, B \sim C$ and $C \sim E$	

This Table reports the collective ranking of policies as elicited by binary comparisons of policies ( $A$  vs  $B$ ;  $A$  vs  $C$ ; etc.).  $E \succ B$  means that a majority of participants report a preference for  $E$  over  $B$ . A one-sided binomial test at 5% significance level:  $i \sim j$ : non-rejection of the null hypothesis that prop. of respondents preferring  $i$  to  $j$  is equal to 0.5;  $i \succ j$ : prop. of respondents preferring  $i$  to  $j$  is higher than 0.5 at 5% significance level. For instance, in MININFO treatment, more than 50% of participants prefer  $D$  to  $B$ .

Table 12: The Condorcet ranking (main survey experiment)

## B Condorcet ranking

It turns out that, in both samples, the Condorcet winner is policy  $D$  in the MININFO treatment and policy  $E$  in the INFOTAXRATES one. The complete collective orderings is given in Table 12. It clearly appears that progressive taxation schemes  $E$  and  $A$  are dominated by policies  $D$ ,  $B$ , and mildly by  $C$  when respondents only have information about final incomes. By contrast, when they are aware of average tax rates, respondents tend to prefer progressive tax schemes (i.e.,  $E$  and  $B$  to  $D$  and  $C$ ). Tables 13 to 15 display all the binary comparisons between policies, for MININFO and INFOTAXRATES treatments and both samples of respondents. Moreover, 58% of the respondents facing INFOTAXRATES treatment consider that policies  $D$  and  $C$  are the two worst options. There is a difference between samples: these policies are judged as the worst ones by 49% of the economics students, but by 62% of the users of the Public Library.<sup>24</sup>

As for the *Information* treatment, the Condorcet collective ranking is the following:<sup>25</sup>

$$E \sim B \succ D \succ A \succ C$$

It seems that there are two differences. The first difference is that  $E$  and  $B$  are closer in view of respondents in the robustness survey experiment.<sup>26</sup> The reversal of the ranking of  $D$  and  $A$  is the second difference. Among respondents of the robustness study, there is a relatively large proportion of them who rank  $D$  as fairer than  $A$ , while respondents of the main survey experiment are less unanimous.

<sup>24</sup>A binomial test concludes that the proportion of respondents who judge policies  $D$  and  $C$  as the two worst options is statistically different from 0.5 for the whole sample and the ‘‘Public Library’’ sample:  $p = 0.0134$  and  $p = 0.0024$ . Concerning the sample of economics students, one cannot reject that half of them give the worst ranking to these policies.

<sup>25</sup>The non-parametric tests, on which this ranking is based, can be found in the Appendix B: See Table 15.

<sup>26</sup>In fact, 62.5% of the respondents prefer  $E$  to  $B$ , but the null hypothesis of equality to 0.5 cannot be rejected in favor of the alternative hypothesis of non-equality ( $p = 0.111$ ). Moreover, at a 10% significance level, the alternative hypothesis that the proportion of respondents preferring  $E$  to  $B$  is larger than 0.5 is accepted ( $p = 0.056$ ).

<b>Treatment MinInfo</b>					<b>InfoTaxRates Treatment</b>				
	Policy E	Policy B	Policy D	Policy C		Policy E	Policy B	Policy D	Policy C
Pol. A	.199***	.139***	.163***	.205***	Pol. A	.301***	.416**	.735***	.855***
Pol. E		.331***	.247***	.313***	Pol. E		.633***	.837***	.873***
Pol. B			.428*	.494	Pol. B			.819***	.886***
Pol. D				.645***	Pol. D				.765***

Table 13: Condorcet ranking: Public Library sample, Main survey experiment

<b>MinInfo Treatment</b>					<b>InfoTaxRates Treatment</b>				
	Policy E	Policy B	Policy D	Policy C		Policy E	Policy B	Policy D	Policy C
Pol. A	.099***	.127***	.085***	.296***	Pol. A	.056***	.225***	.493	.803***
Pol. E		.338***	.254***	.451	Pol. E		.803***	.887***	.958***
Pol. B			.282***	.563	Pol. B			.831***	.944***
Pol. D				.789***	Pol. D				.958***

Table 14: Condorcet ranking: University sample, Main survey experiment

<b>InfoTaxRates Treatment</b>				
	Policy E	Policy B	Policy D	Policy C
Pol. A	.042***	.146***	.25***	.75***
Pol. E		.625	.833***	.938***
Pol. B			.833***	.896***
Pol. D				.917***

Table 15: Condorcet ranking: Robustness experiment

These tables indicate the proportion of respondents who prefer the policy of that the row to the policy of that the column, for both frames A and B and each sample. Binomial tests for the null hypothesis equal to 0.5 are performed: \* Significant at 10% level, \*\* Significant at 5% level, \*\*\* Significant at 1% level.

## C Regression Results

### C.1 Preference for tax progressivity in the main survey experiment

The first model aims to evaluate the effect of treatments and samples in the choice of the preferred item made by respondents:

$$\text{Fairest Policy}_i^f = \alpha f + \beta s_i + \gamma f x_i + \delta f x_i + \varepsilon_{if} \quad (2)$$

where  $f$  is an indicator of the treatment ( $f = 0$  for the MININFO treatment and 1 for the INFOTAXRATES treatment),  $s_i$  is a variable indicating sample ( $s_i = 1$  if it is the University sample and 0 if it is the Public Library sample) and  $x_i$  is a vector of individual control variables. The controls are the following: gender, political preference, age, occupation (student/non-student) and field of study if a student (economics and other). The possible outcome of the endogenous variable  $\text{Fairest Policy}_i^f$  is ordered increasingly with respect to the degree of progressivity:  $\text{Fairest Policy}_i^f = 1$  if  $i$  chooses policy A,  $= 2$  if  $i$  chooses policy E, etc.,  $= 5$  if  $i$  chooses policy C. This is then an ordered probit model and parameters  $\alpha$ ,  $\gamma$  and  $\beta$  of equation (2) are estimated by the maximum likelihood method.

Table 16 reports the results of the estimation of equation (2): in the first column, the only explanatory variable is the treatment, while, in the second one, the sample (Public Library or University) is also considered. In the third column, the student variable is introduced and, in the last one, other control variables are integrated. For both regressions, being provided with information about average tax rates leads respondents to be more likely to choose more progressive taxation. It is also found that, when everything else is equal, there is no difference in the choice of the fairest policy between respondents of the Public Library sample and the University one.

In the second set of models, the endogenous variable is the Borda score given by  $i$  to policy  $j$  in frame  $f$ :

$$b_{ij}^f = \alpha P_j + \beta f P_j + \gamma s_i P_j + \delta s_i f P_j + \varepsilon_{if} \quad (3)$$

where  $b_{ij}^f$  is the Borda score given by  $i$  to policy  $j$  in treatment  $f$  and  $P_j$  captures tax progressivity. As for the latter, I use three binary variables for progressive (A and E), proportional (B) and regressive (D and C) schemes.

Table 17 reports the results of these models: (1) when only progressivity and the informational frame are introduced ; (2) with interaction with the sample (University vs Public Library) ; (3) with interaction with students. The main results may be summarized as follows. First, the econometric estimates indicates that regressive (or progressive) schemes have a lower (or higher respectively) Borda scores in the INFOTAXRATES treatment. Moreover, the null hypothesis according to which the scores of both treatments are equal is strongly rejected (Wald test,  $p < 0.001$  for all estimates). Second, it seems that the sample (University or Public Library) has no effect on how participants rank the available policies (see column (2)). Third, there is slight evidence that students are different than non-students: the latter participants seems to be more inclined to be consequentialist (see column (3)).

	Fairest Policy (ordered probit model)			
	(1) Coef./ <i>(se)</i>	(2) Coef./ <i>(se)</i>	(3) Coef./ <i>(se)</i>	(4) Coef./ <i>(se)</i>
INFOTAXRATES	-1.196*** (.1157)	-1.175*** (.136)	-1.194*** (.1847)	-1.469** (.6745)
University		.1712 (.1583)		.1981 (.2116)
University × INFOTAXRATES		-.07835 (.1894)		-.3405 (.4589)
Student			-.02832 (.1515)	-.5051** (.2272)
Student × INFOTAXRATES			-.003799 (.2073)	.06375 (.3474)
Economics				.2103 (.1628)
Economics × INFOTAXRATES				.1694 (.4062)
Female				-.2681* (.1612)
Female × INFOTAXRATES				.2868 (.2162)
Pol: Left				-.3888** (.1941)
Pol: Left × INFOTAXRATES				.3444 (.2578)
Pol: Right				-.1997 (.2175)
Pol: Right × INFOTAXRATES				.3797 (.2973)
Age				-.00991 (.008653)
Age × INFOTAXRATES				-.006366 (.01382)
N	474	474	474	454
$R_p^2$	.09304	.09423	.0931	.111

Significance levels: \* Significant at 10% level, \*\* Significant at 5% level, \*\*\* Significant at 1% level.

Table 16: Regression results: Fairest policy

Finally, I also rely on a model where the endogenous variable is the Borda score given by  $i$  to policy  $j$  in the INFOTAXRATES treatment:

$$b_{ij}^1 = \alpha + \beta P_j + \gamma \tilde{b}_{ij} + \delta b_{ij}^0 \times P_j + \epsilon_{ij} \quad (4)$$



		Borda score		
		(OLS)		
		(1)	(2)	(3)
		Coef./ <i>(se)</i>	Coef./ <i>(se)</i>	Coef./ <i>(se)</i>
Progressive tax		1.222*** (.06033)	1.199*** (.07222)	1.163*** (.1041)
Proportional tax		2.435*** (.06881)	2.458*** (.08497)	2.482*** (.1165)
Regressive tax		2.563*** (.06434)	2.575*** (.07589)	2.602*** (.1105)
INFOTAXRATES	× Progressive tax	1.43*** (.07926)	1.482*** (.09718)	1.633*** (.1269)
	× Proportional tax	.2489*** (.09524)	.1988 (.1214)	.253 (.1693)
	× Regressive tax	-1.553*** (.07982)	-1.578*** (.09979)	-1.747*** (.1346)
University	× Progressive tax		.07585 (.1315)	
	× Proportional tax		-.07755 (.1434)	
	× Regressive tax		-.04009 (.1432)	
INFOTAXRATES×University	× Progressive tax		-.1721 (.1664)	
	× Proportional tax		.1674 (.1877)	
	× Regressive tax		.08536 (.1632)	
Student	× Progressive tax			.0906 (.1277)
	× Proportional tax			-.07284 (.1444)
	× Regressive tax			-.0602 (.136)
INFOTAXRATES×Student	× Progressive tax			-.3111* (.1616)
	× Proportional tax			-.006259 (.2046)
	× Regressive tax			.2989* (.1667)
N		2370	2370	2370
R <sup>2</sup>		.7553	.7555	.7563

Significance levels: \* Significant at 10% level, \*\* Significant at 5% level, \*\*\* Significant at 1% level.

Table 17: Regression results: Borda score

Table 18 reports the estimation of equation (4) by OLS (with clustered standard-errors by individuals): in columns (1), (2), (3) and (5), the Borda score given by respondents in the MININFO treatment is a continuous variable, while, in column (3), binary variables for the possible outcomes are used. In columns (2) and (3), cross-effect variables between tax shape variables/Borda score and sample are added. In column (3), are also added cross-effect variables between sample and controls (female, gender, political preference, age, occupation and field of study). In column (4), cross-effect variables between tax shape and the Borda score are integrated. In all the regressions, progressive and proportional tax policies are more likely to rank well than regressive ones. Also, it seems that switching from tax progressivity to proportionality has no effect on the rank of a policy:  $p = 0.1285$ , Wald tests based on regression displayed in column (1).

The Borda score that the respondents give to  $j$  in the MININFO treatment has, on average, a positive and significant effect on its attractiveness in the INFOTAXRATES, but the effect appears to be lower. For instance, based on regression in column (3), it turns out that the relative effect of tax progressivity with respect to regressive taxation is significantly larger than the effect of an increase in the Borda score by 4 points (score going from 0 to 4):  $p < 0.001$ , Wald test. The results displayed in column (4) also indicate that the Borda score given in the MININFO treatment has a non-linear effect. Indeed, an increase from 0 to 1 significantly improves the attractiveness of  $j$  ( $p < 0.01$ ), but, for a higher value, the effect is negligible. A series of Wald tests applied to column (5) shows that increases from 1 to 2, from 2 to 3, and from 3 to 4 have no significant effect:  $p = 0.6713$ ,  $p = 0.9702$  and  $p = 0.2138$ , respectively. Likewise, there is no effect of an increase in  $\tilde{b}_{ij}$  from 1 to 3 ( $p = 0.6225$ ) or from 2 to 4 ( $p = 0.2518$ ), and from 1 to 4 ( $p = 0.1110$ ). The Borda score given in the MININFO treatment seems to have a different effect on that given in the INFOTAXRATES one according to the tax shape of  $j$ . However, if one can conclude that  $\tilde{b}_{ij}$  has a stronger effect if  $j$  is progressive or regressive than if  $j$  is proportional ( $p = 0.0086$  and  $p = 0.0392$  respectively), then the hypothesis that it has the same effect if  $j$  is progressive or regressive cannot be rejected ( $p = 0.1354$ ).

Finally, columns (2) and (3) suggests that there is a significant difference between samples. Indeed, the Borda score given in the INFOTAXRATES treatment is more sensitive to the one given in the MININFO treatment for respondents from the University sample than for the ones from the Public Library one. That is, economics students put more weight on the final situation than on properties of the tax function.

## C.2 Robustness to information saliency

This section tests the statistical significance of the robustness to saliency of new information. The following models are estimated:

$$\text{Fairest Policy}_i^f = \alpha_0 + \alpha_1 f_{\text{INFOTAXRATES,Main}} + \alpha_2 f_{\text{INFOTAXRATES,Robust.}} + \lambda x_i + \varepsilon_{if} \quad (5)$$

$$\begin{aligned} b_{ij} = & \beta_0 + \text{Prog}_j \times (\beta_1 f_{\text{MININFO,Main}} + \beta_2 f_{\text{INFOTAXRATE,Main}} + \beta_3 f_{\text{INFOTAXRATE,Robust.}}) \\ & + \text{Prop}_j \times (\gamma_1 f_{\text{MININFO,Main}} + \gamma_2 f_{\text{INFOTAXRATE,Main}} + \gamma_3 f_{\text{INFOTAXRATE,Robust.}}) + \epsilon_{ij} \end{aligned} \quad (6)$$

Borda score in INFOTAXRATES					
(OLS)					
	(1)	(2)	(3)	(4)	(5)
	Coef./ <i>(se)</i>	Coef./ <i>(se)</i>	Coef./ <i>(se)</i>	Coef./ <i>(se)</i>	Coef./ <i>(se)</i>
Progressive tax	1.854*** (.09891)	1.784*** (.124)	1.859*** (.6391)	1.843*** (.09785)	1.767*** (.1186)
Proportional tax	1.693*** (.09209)	1.668*** (.1164)	1.493** (.6406)	1.653*** (.09491)	2.109*** (.1927)
Regressive tax	(ref)	(ref)	(ref)	(ref)	
Borda score in MININFO	.1585*** (.03044)	.0727** (.03662)	.00856 (.2038)		
<i>s</i> interacted with:					
Progressive tax		-.4581*** (.1507)	-.3719 (.3259)		
Proportional tax		-.5699*** (.2076)	-.1799 (.4078)		
Regressive tax		-.6605*** (.1606)	-.5859 (.4349)		
Borda score in MININFO		.2796*** (.0619)	.2096 (.1295)		
Borda score in MININFO					
=1				.591*** (.1134)	
=2				.6114*** (.1205)	
=3				.6589*** (.1199)	
=4				.7587*** (.131)	
Borda in MININFO interacted w.:					
Progressive tax					.2212*** (.0452)
Proportional tax					-.01667 (.06578)
Regressive tax					.1543*** (.03558)
constant	.6043*** (.08459)	.8098*** (.1067)	.9301 (.6262)	.4099*** (.09388)	.615*** (.09283)
Addionnal controls	(no)	(no)	(yes)	(no)	(no)
N	1185	1185	1060	1185	1185
<i>R</i> <sup>2</sup>	.3475	.3617	.3806	.3583	.3523

Table 18: Regression results: Borda score

where  $f_{x,e} = 1$  if respondent  $i$  belongs to experiment  $e$  (= Main if main survey experiment; = Robust. if robustness survey experiment) and sees treatment  $x$  (= MININFO or INFOTAXRATES), 0 otherwise. Equation (5) is estimated using an ordered probit model and equation (6) using OLS methods. Table (19) presents the results of these estimations. First, the between-respondent analysis allows the effect of providing information about tax rates to be tested, by studying the sign of  $\alpha_2$  in equation 5 and that of  $\beta_1 - \beta_3$  and  $\gamma_1 - \gamma_3$ . The results displayed in Table 19 indicate that there is a significant effect of providing information about tax rates. Indeed, as columns (1) and (2) show, the preferred alternative chosen by the respondents differs significantly between the control group and the main group. Moreover, the estimation of equation (6) shows that progressive or proportional policies are better ranked by control sample respondents than by the main sample respondents in the MININFO treatment:  $p < 0.001$ , two-sided Wald tests with  $H_0 : \beta_1 = \beta_3$  or  $H_0 : \gamma_1 = \gamma_3$ .

Second, estimating the sign of  $\alpha_1 - \alpha_2$  in equation (5) and that of  $\beta_2 - \beta_3$  and  $\gamma_2 - \gamma_3$  in equation (6) make it possible to test the effect of the saliency of new information on respondents' preferences. It turns out that there is a small but significant difference in response between respondents from the main experiment given the INFOTAXRATES and those from the robustness one:  $p = 0.115$  and  $p = 0.080$ , two-sided Wald test with  $H_0 : \alpha_1 = \alpha_2$ , response based on models in col. 1 (without controls) and 2 (with controls). From column (3), it is also found that progressive policies are (slightly) better ranked in the INFOTAXRATES treatment by respondents in the main experiment than by those in the robustness experiment:  $p = 0.055$ , two-sided Wald tests with  $H_0 : \beta_2 = \beta_3$ . This is not the case for proportional policies:  $p = 0.1408$ , two-sided Wald tests with  $H_0 : \gamma_2 = \gamma_3$ .

	Fairest Policy (ordered probit)		Borda score in INFOTAXRATES (OLS)
	(1)	(2)	(3)
	Coef./(se)	Coef./(se)	Coef./(se)
MININFO, Univ.	(ref)	(ref)	
$f_{\text{INFOTAXRATES,Univ.}}$	-1.299*** (.208)	-1.37*** (.2267)	
$f_{\text{INFOTAXRATES,Control}}$	-.9727*** (.2246)	-.9618*** (.2415)	
Prog <sub>j</sub> interacted with:			
$f_{\text{MININFO,Univ.}}$			-.3867** (.1631)
$f_{\text{INFOTAXRATES,Univ.}}$			.8873*** (.143)
$f_{\text{INFOTAXRATES,Control}}$			.6137*** (.1483)
Prop <sub>j</sub> interacted with:			
$f_{\text{MININFO,Univ.}}$			.716*** (.1592)
$f_{\text{INFOTAXRATES,Univ.}}$			1.059*** (.1406)
$f_{\text{MININFO,Univ.}}$			1.291*** (.1512)
constant			1.668*** (.07287)
controls	(no)	(yes)	(no)
N	194	190	970
Pseudo- $R^2$	.09404	.1289	.1029
chi2	40.28	52.28	190.5
$p$ -value	<0.001	<0.001	<0.001

Table 19: Regression results: Robustness to saliency of new information

## D Comments by Respondents

This section reports the comments given by respondents just after the fairness ranking task in the INFO-TAXRATES treatment. I collected comments from 56 (student) respondents of the main survey experiment, and 25 (student) respondents of the robustness one. As such, the participation rate is 79% in the main survey experiment, and 52% in the robustness one.

There are three categories of comments: (A) concerns about final situations (distribution of final incomes) (B) concerns about taxation, and (C) concerns about merit. Concerning the main experiment, a majority of respondents (more than 80%) evoke considerations related to the shape of the tax function and more than half of them justify their fairness ranking based on tax progressivity (i.e., comments such as “the richest should be taxed more than the middle-class”). About 25% of respondents believe that taxing only one Group of taxpayers is not fair, and a small part of them (less than 15%) think that tax liability paid by the richest should not be too high, and that the middle-class should also contribute. Only 19% of respondents report concerns about the post-tax distribution of incomes and it seems that they mainly focus on inequality between groups. Only 11% mention both concerns about final situations and the shape of the tax function. The comments provided by the respondents of the robustness experiment are not significantly different. The proportion of respondents concerned by final situations seems to be higher in the robustness experiment, but a  $\chi^2$  homogeneity test does not reject the null hypothesis of equality in both treatments ( $p = 0.656$ ).

	Number of respondents (fraction)	
	Main exp. [56 respondents]	Robustness exp. [25 respondents]
A: Concerns about final situations	11 (0.19)	6 (0.24)
A-1: Income inequality	9 (0.16)	4 (0.16)
A-2: Minimal income	2 (0.04)	2 (0.08)
B: Concerns about taxation	46 (0.82)	21 (0.84)
B-1: Type III should pay more than Type II	31 (0.55)	14 (0.56)
B-2: Type III should not pay too much in tax	7 (0.13)	5 (0.2)
B-3: Type II should contribute	8 (0.14)	5 (0.12)
B-4: Average tax rate should be the same for all	4 (0.07)	3 (0.24)
B-5: Taxing only one group is not fair	15 (0.27)	6 (0.24)
B-6: Incentive argument	0 (0)	1 (0.04)
A and B	6 (0.11)	4 (0.07)
C: Concerns about merit	5 (0.09)	3 (0.12)

Table 20: Category of comments

## E The questionnaires (translated from the French)

### E.1 General instructions: All questionnaires

[*Read out loud by the experimenter.*] This questionnaire was developed by a researcher in economics and social sciences at the University of Rennes 1. The aim is to help identify fairer public policies. The answers you give are anonymous. There are no right or wrong answers. What we are interested in is **your personal opinion**.

This questionnaire consists of [**2-3**] **parts**. In the [-2] first part[s], you are asked to study **various scenarios**. In each scenario, you are asked to **evaluate income taxation and redistribution schemes**. In the last part, you are invited to answer some additional questions.

The mean response time is about 10 minutes.

[*From there, read individually by the respondents.*] We consider a society. In this society, there are three 'types' of citizens: Type I (30% of the population); Type II (60% of the population); Type III (10%). The citizens of type I have the lowest skills, while persons of Type III have the highest skills. Citizens of Type II have intermediate skills. These differences are due **solely to differences in family background**.

Thus, for one working hour, Type I individuals earn a lower income than Type II individuals, who earn a lower income than those of Type III.

The **sole** source(s) of individual income is **earnings from work** and possibly **social transfers**.

The government can implement taxation and income redistribution policies. In the scenarios, you are asked to evaluate different possible policies.

### E.2 Choice tasks

#### Scenario A ( MININFO scenario)

The government has the choice between five income redistribution policies: policies (a), (b), (c), (d) and (e). Each of these policies leads to difference personal incomes. The following table shows the **monthly incomes in euros after taxes and redistribution** for the alternative policies:

	Types		
	Type I	Type II	Type III
policy (a)	550	1800	2450
policy (b)	925	1530	3145
policy (c)	1100	1350	4000
policy (d)	1040	1440	3330
policy (e)	790	1620	2720

*Reading.* The **first line (policy (a))** indicates that **after** implementing **policy (a)**, the income of a person of type I is of €550, the income of a person of type II is of €1,800 and the income of a person of type III is of €2,450.

[*Main questionnaire*] Question: **Please rank these five alternative policies from the fairest (1)**

to the least fair (5).

For each column of the following table, please indicate the policy of your choice.

Alternative policies	Ranking				
	fair				least fair
	1	2	3	4	5
policy (a)					
policy (b)					
policy (c)					
policy (d)					
policy (e)					

*Table completion.* In the column ‘1’, you can indicate the policy you judge as the fairest. In the column ‘2’, you can indicate the policy you rank second, etc. In the last column, you can indicate the least fair policy.

[Choice questionnaire] Question: **Imagine you are in a position of decision-maker for this society. Please indicate which policy you choose to implement.**

*Choose the policy of your choice.*

Alternative policies	Your choice
policy (a)	
policy (b)	
policy (c)	
policy (d)	
policy (e)	

### Scenario B (INFOTAXRATES scenario)

The government has the choice between five income redistribution policies: policies (a), (b), (c), (d) and (e). Each of these policies leads to different personal incomes.

These policies involve redistributing income from citizens of Type II and/or III to the ones of Type I. The following table shows the level of tax rate for each type of individual:

	Types		
	Type I	Type II	Type III
policy (a)	-	0%	30%
policy (b)	-	15%	15%
policy (c)	-	25%	0%
policy (d)	-	20%	10%
policy (e)	-	10%	20%



*Reading.* The **first line (policy (a))** indicates that, if **policy (a)** is implemented, the tax rate faced by a person of type III is of 30%. That is, for €100 of earnings, the tax liability is of €30. There is no tax on income of citizens of type I.

Given the effects of taxation on the number of working hours, the **monthly incomes in euros after taxes and redistribution** for the alternative policies are:

	Types		
	Type I	Type II	Type III
policy (a)	550	1800	2450
policy (b)	925	1530	3145
policy (c)	1100	1350	4000
policy (d)	1040	1440	3330
policy (e)	790	1620	2720

Question: *(same questions)*