

## Working Paper

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### Income Tax and the Motivation to Work

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## **Income Tax and the Motivation to Work**

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### **Abstract**

How does income tax influence the motivation to work? We propose that the degree of effort exertion in the presence of income tax depends on people's attitudes toward two key components of taxation: redistribution and government intervention. For people favorable toward both, working while taxed is aligned with personal identity and may actually enhance motivation. All others, however, may find taxes demotivating. In two incentive-compatible labor experiments, framing wages as subject to an income tax reduced participants' productivity unless they were chronically favorable toward both redistribution and government intervention. This latter group was significantly more productive when taxed. An objectively equivalent intervention that did not redistribute a portion of participants' wages (framed as a wage "match" rather than a "tax") did not motivate anyone to work harder. Our findings suggest that the net effect of income tax on productivity depends on the distribution of attitudes toward redistribution and government intervention.

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The appropriate level(s) and consequences of income tax are a frequent source of political debate. Economic theory suggests that the introduction of income tax has opposing effects on the motivation to work: It makes leisure more tempting (i.e., relatively less costly), but also produces a greater need to work to maintain one's current lifestyle ("substitution" and "income" effects, respectively). Macroeconomic studies have reached conflicting conclusions about the net effect of income tax rates on labor supply (e.g., Keane 2011; Saez, Slemrod, and Giertz 2012). Limited experimental research on the influence of income tax on effort has also documented opposing effects, with Kessler and Norton (2014) finding negative effects of income tax on effort, and Djanali and Sheehan-Connor (2012) finding positive effects.

Reconciling divergent findings may hinge on a better understanding of the individual-level psychological effects of income tax. Many share the intuition that, as taxes increase, taxpayers' motivation to work decreases. In fact, some people have publicly considered an extreme reaction termed "going Galt" (quitting their jobs in response to what feels like unjust taxation), inspired by *Atlas Shrugged* protagonist John Galt (Etheridge 2009). Indeed, some prior work on sales and carbon taxes suggests that many people find taxes irritating (Sussman and Olivola 2011; Hardisty, Johnson, and Weber 2010; see also McCaffery and Baron 2006). Income tax, in particular, has several properties that people find irritating. Although the U.S. federal income tax structure is progressive, many people feel that the rich do not pay their fair share due to loopholes and other policies that favor the rich (Pew Research 2015). The complexity of the tax code itself is also a source of frustration for many, particularly around the time that annual tax returns are due (Mulligan 2010).

In addition to these factors, we propose that income tax has at its core two defining features that may or may not align with citizens' own attitudes and thus may lead to different effects on their motivation to work. First, income tax is typically viewed as redistributive (Helderman 2012). For example, in August 2012, a conservative millionaire named Norman Litz took out a full-page ad in the *New York Times* to argue, among other things, that "paying taxes is a form of charitable giving" (Rosenman 2012). In reality, many federal tax revenues do finance programs that help people with lower income (e.g., Medicaid), though some tax revenues finance programs that are not explicitly redistributive (e.g., National Defense). The second defining feature of income tax is that it is a government intervention: It involves the government collecting a portion of taxpayers' income and making decisions about how this money should be spent. While some government expenditures are surely viewed as benign and necessary (e.g., fixing potholes), income tax is often viewed as a "meddlesome" intervention (Lepore 2012; Surowiecki 2014).<sup>1</sup> The lack of control over how one's tax dollars are spent is a key driver of many citizens' distaste for taxation (Lamberton 2013).

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<sup>1</sup> For example, former congressman Ron Paul argues on his website that income tax is "the most degrading and totalitarian of all possible taxes."

It is worth emphasizing that, while redistribution can be a form of government intervention, the two activities are often separable. It is entirely possible to have government intervention without redistribution (e.g., collecting taxes to fund National Defense) and redistribution without government intervention (e.g., citizens choosing to donate some of their wealth to lower-wealth recipients).

Taxpayers likely vary in their aversion to redistribution and government intervention. We believe that such variation will lead to variation in the motivation to work in the presence of income tax and that an understanding of these underlying attitudes can help to reconcile disagreement in the literature about the impact of tax on productivity. Because there are two distinct features of income tax, we can anticipate four possible combinations of attitudes. For example, while some people may be opposed to redistribution because they do not perceive much wealth inequality (Norton and Ariely 2011) or because they believe that redistribution undermines upward mobility (Benabou and Ok 2001), they might still believe that government intervention is generally positive. Conversely, some people may want to minimize government intervention, perhaps due to mistrust in government (e.g., Kuziemko et al. 2015) or philosophical objections, while engaging in redistributive efforts on their own terms (e.g., donating money). Others are likely to oppose both redistribution and government intervention, and still others are likely to favor both measures.

These four combinations of attitudes are unlikely to map neatly onto political party affiliation. For example, Republicans differ widely in their support for redistributive policies (e.g., Matthews 2014). However, the “Cultural Cognition Worldview” scale developed by Dan Kahan and colleagues (e.g., Kahan 2012; Kahan, Jenkins-Smith, and Braman 2011) essentially measures individuals’ attitudes regarding the two central features of income tax, which underlie the four combinations discussed above. The scale assesses respondents’ attitudes toward social equality and redistribution (their level of “egalitarianism”) by asking them to rate their agreement with statements such as, “We need to dramatically reduce inequalities between the rich and poor, whites and people of color, and men and women.” The scale assesses respondents’ attitudes toward government intervention (their level of “communitarianism”) by asking them to rate their agreement with statements such as, “The government should do more to advance society’s goals, even if that means limiting the freedom and choices of individuals.” Though these attitudes tend to be related (e.g., people who desire societal equality also tend to believe government should play a strong role in citizens’ lives), they are far from perfectly correlated. In fact, Kahan (2012) noted that it is most appropriate to consider “four ways of life”: people who are high on both egalitarianism and communitarianism (which we will refer to as “High E / High C” types), high on egalitarianism and low on communitarianism (“High E / Low C”), low on egalitarianism and high

on communitarianism (“Low E / High C”), and low on both egalitarianism and communitarianism (“Low E / Low C”).<sup>2,3</sup>

Kahan et al. (2007, p. 471) argued that these attitudes represent “highly salient commitments that are likely to shape individuals’ identities.” Prior work in psychology suggests that individuals possess multiple identities (e.g., “rugged individual” or “Midwesterner,” Oyserman 2009, p. 251), and identities that are made salient in a particular situation can influence cognition, motivation, and behavior (LeBoeuf, Shafir, and Bayuk 2010; Reed et al. 2012). In particular, identity-based theories of motivation posit that the extent to which aspects of a task align with salient identities influences motivation (e.g., Oyserman 2007; 2009). This framework suggests that people experience a “motivational pull toward identity-congruent action” (Oyserman 2009, p. 252) and are repelled by activities that conflict with salient identities.<sup>4</sup> From this perspective, the prospect of working in the presence of a salient income tax should be motivating to High E / High C types, who are favorable to both central components of income tax. Others, who are unfavorable to at least one central component of income tax (redistribution and/or government intervention), are likely to find working in the presence of a salient income tax to be identity-incongruent and, as a result, demotivating.

Notably, our account for the consequences of income tax is not incompatible with any of the previously discussed findings (e.g., Djanali and Sheehan-Connor 2012; Kessler and Norton 2014). Our framework suggests that the net effect of income tax on the motivation to work will depend on the prevalence of different attitudes toward redistribution and government intervention in the particular study population. Aside from important differences in methods across past experiments, our reasoning suggests that differences in the distributions of the relevant attitudes across study populations may have played a role in producing the divergent results.

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<sup>2</sup> Despite its clear relevance to income tax, this scale has never been used to predict reactions to income tax. Instead, it has been used to help explain people’s attitudes toward other policy-relevant issues, such as climate change (Kahan et al. 2012), gun control, and nuclear power (Kahan et al. 2007). We believe that the underlying attitudes captured by this scale can also help predict behavioral reactions to income tax.

<sup>3</sup> Similar to Kahan’s perspective, Graham, Haidt, and Nosek (2009) also conceptualize political preferences as more complicated than simply left/right or liberal/conservative. Graham et al. (2009) developed a scale to measure five “moral foundations” that underlie political preferences: harm-avoidance (e.g., “It can never be right to kill a human being”), fairness (e.g., “Justice, fairness, and equality are the most important requirements for a society”), loyalty to the ingroup (e.g., “Loyalty to one’s group is more important than one’s individual concerns”), respect for authority (e.g., “If I were a soldier and disagreed with my commanding officer’s orders, I would obey anyway because that is my duty”), and purity (e.g., “People should not do things that are revolting to others, even if no one is harmed”). In a survey measuring egalitarianism, communitarianism, and these five moral foundations on Amazon Mechanical Turk (N = 305), we found moderate relationships between egalitarianism and some of the foundations (e.g., egalitarianism scores correlated positively with fairness concerns,  $r(303) = .36, p < .01$ ). However, communitarianism did not neatly map onto any of the foundations (e.g., the correlation between communitarianism and respect for authority was .02).

<sup>4</sup> Similarly, economists have argued that congruence between employees’ identities and an organization’s “mission” (Besley and Ghatak 2005) or “idealistic or ethical purpose” (Dixit 2002, p. 715) can influence employees’ motivation.

To investigate the ways in which attitudes toward the central features of income tax moderate its influence on the motivation to work, we utilize incentive-compatible, real-effort laboratory experiments. We manipulate whether or not income earned in the lab is subject to a tax, but we always hold net wages constant across conditions. Thus, any influence of income tax on the motivation to work in our experiments cannot be explained by substitution or income effects. Instead, variation in the motivation to work can only be attributed to variation in psychological reactions to income tax, which we anticipate will be a function of the extent to which the task is experienced as identity-congruent. We do not exclude any participants or experimental conditions from our analyses, and we report all measures collected.

### **Experiment 1**

In Experiment 1, we investigated how attitudes toward redistribution and government intervention moderate the influence of income tax on the motivation to work. Income tax in our experiment was redistributive: We told some participants (truthfully) that their tax payments would be redistributed to other students (participating in different studies). We did this to create a perception that is common outside the laboratory – namely, that income tax revenues benefit other people (Helderman 2012; Rosenman 2012). The beneficiaries of tax revenue in our experiment were not impoverished, but we did specify that these participants were working without the opportunity to earn their own study compensation. We reasoned that High E / High C types would find working in the presence of income tax to be identity-congruent. As a result, we predicted that they would be more motivated to work when their wages were taxed than when their wages were not taxed. By contrast, all other participants are likely to find working in the presence of income tax to be identity-incongruent. As a result, we predicted that they would be less motivated to work when their wages were taxed.

#### *Method*

Undergraduates at a large, public Midwestern university (N = 233, 50% female) participated as part of a course requirement. We told participants that they would have the opportunity to earn money by performing a counting task. In each round of the task, adapted from Abeler et al. (2011), participants had to count the number of zeros contained within a matrix of zeros and ones. The task was quite tedious (see Appendix A for sample). Participants earned \$0.20 for each acceptable response (within  $\pm 1$  of the correct number). Participants earned nothing for unacceptable responses. Participants could complete up to 20 rounds (the maximum number of possible rounds was not revealed in advance). Participants could also choose to stop at any time. Specifically, at the beginning of each round, before displaying the next matrix, we asked participants “Do you want to count zeros in [a/another] matrix?” Participants clicked Yes or No; if they clicked Yes, we displayed the next matrix, and if they clicked No, the task concluded (and then

participants completed survey measures, described below). We implemented this feature (explicit continue-or-stop decisions) to disentangle disinterest in beginning or continuing the task from simple counting mistakes. Without an opportunity to opt out of the task, a disinterested participant may simply make a series of guesses, which would ultimately be coded as a set of highly inaccurate responses. This experiment was conducted along with several other (unrelated) experiments (as part of a required session for students), so opting out of the task early meant moving on to the survey measures (described below) more quickly, as well as the next experiments, and thus being able to leave the lab session a few minutes early.

Participants were randomly assigned to one of two conditions. In the Control condition, participants were simply paid \$0.20 for each acceptable response. In the Tax condition, participants were initially paid \$0.40 per acceptable response, but \$0.20 in tax was immediately deducted. We (truthfully) told participants in the Tax condition (in the initial instructions) that their tax payments would be redistributed to “students who participate in different studies with different tasks that do not allow participants to earn money themselves.” Importantly, note that our tax manipulation did not influence the net pay participants received for each acceptable response: In both conditions, participants personally earned \$0.20 for each acceptable response. Thus, from a perfectly self-interested perspective, our manipulation should not influence participants’ motivation to work. At the conclusion of each round, we informed participants whether their response was acceptable by displaying a paycheck (see Appendix A for samples).

At the conclusion of the task, participants completed the short-form of the Cultural Cognition Worldview scale, which is as reliable as its full-form counterpart (Kahan, Jenkins-Smith, and Braman 2011). The scale taps into the two central attitudes relevant to income tax (see Appendix A for the complete scale). The items were scored such that higher scores on the two subscales reflected greater egalitarianism and greater communitarianism, respectively. The mean interitem correlation within each subscale (a measure of internal consistency that is independent of the number of items in the scale) was .35 and .19, respectively, both above the .15 threshold recommended by Clark and Watson (1995, p. 316). Importantly, neither egalitarianism scores nor communitarianism scores differed by condition (both  $ps > .50$ ). Participants also indicated their political affiliation (Republican, Democrat, or Independent). We also administered some exploratory measures (listed in Appendix B), but we focus our analyses on our central predictions.

### *Results and Discussion*

We utilized total earnings as our measure of participants’ motivation to work. Total earnings are a function of both the number of rounds attempted (i.e., the number of rounds where participants provided

either an acceptable or unacceptable response) and precision (i.e., ability to approximately identify the correct number of zeros). Because there were generally few errors, total earnings correlated highly with the number of rounds attempted ( $r(231) = .94, p < .0001$ ).

A linear regression of total earnings on a Tax condition dummy (= 1 for Tax condition, = 0 for Control condition) revealed no main effect of our tax manipulation ( $p = .43$ ; see Table 1, Model 1). However, a linear regression of total earnings on Tax condition, egalitarianism scores, communitarianism scores (both mean-centered), and their interactions revealed a significant Tax  $\times$  egalitarianism  $\times$  communitarianism interaction ( $p < .01$ ; see Table 1, Model 2).<sup>5</sup> We performed a spotlight analysis to probe this three-way interaction (Aiken and West 1991). Specifically, we examined the influence of tax on total earnings at high and low levels of both egalitarianism and communitarianism (1 *SD* above and below their respective means; see Figure 1). Tax reduced earnings among Low E / Low C types ( $p = .094$ ), Low E / High C types ( $p < .01$ ), and High E / Low C types, albeit non-significantly ( $p = .45$ ). Critically, among High E / High C types, tax significantly increased total earnings ( $p < .01$ ).<sup>6</sup>

Follow-up analyses confirmed that the only significant difference between High E / High C types and other participants was in the Tax condition. When we focused on the Control condition only, and regressed total earnings on egalitarianism scores, communitarianism scores (both mean-centered), and their interaction, we found a marginal effect of egalitarianism ( $B = -3.70, SE = 2.11, t(112) = 1.76, p = .08$ ), no effect of communitarianism ( $p = .70$ ), and, most importantly, no egalitarianism  $\times$  communitarianism interaction ( $p = .38$ ). This indicates that High E / High C types were not especially motivated or demotivated in the Control condition. However, when we focused on the Tax condition only, and regressed total earnings on egalitarianism scores, communitarianism scores (both mean-centered), and their interaction, we found no effect of egalitarianism ( $p = .23$ ), no effect of communitarianism ( $p = .12$ ), and, most importantly, a significant egalitarianism  $\times$  communitarianism interaction ( $B = 1.19, SE = .39, t(113) = 3.02, p < .01$ ).

We also investigated whether cultural worldview scores were simply a proxy for political affiliation. In other words, is High E / High C just another label for Democrat (or non-Republican)? This

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<sup>5</sup> Because egalitarianism and communitarianism were correlated ( $r = .32$ ), we examined whether there was a potential multicollinearity problem in the multiple regression by assessing the variance inflation factors of each coefficient (VIFs; Hair et al. 2006). The highest VIF (2.26) was less than the standard cutoff of 5 (Hair et al. 2006), so we concluded that multicollinearity was not a significant concern here.

<sup>6</sup> Other plausible measures of the motivation to work could be constructed from our data. For example, we could examine the proportion of participants who earned any money at all. We conducted a logistic regression predicting a binary Earn Anything (or not) variable, utilizing the same independent variables from Table 1, Model 2. As in the analysis of total earnings, we found a significant Tax  $\times$  egalitarianism  $\times$  communitarianism interaction ( $p < .01$ ). Spotlight analysis revealed that tax non-significantly reduced the probability of earning anything among Low E / Low C types ( $p = .51$ ) and High E / Low C types ( $p = .11$ ), and significantly reduced the probability of earning anything among Low E / High C types ( $p < .01$ ). However, among High E / High C types, tax marginally increased the probability of earning anything ( $p = .079$ ).



is important to investigate given that political affiliation moderates reactions to other types of taxes (Hardisty, Johnson, and Weber 2010; Sussman and Olivola 2011). Certainly, political affiliation is correlated with one's degree of egalitarianism and communitarianism. Models 1 and 2 of Table 2 reveal that both Democrats and Independents were significantly more egalitarian and communitarian than Republicans ( $ps < .01$ ). However, our subsequent analyses suggest that one's degree of egalitarianism and communitarianism more precisely captures reactions to income tax than political affiliation. Specifically, Models 3-5 of Table 2 reveal that political affiliation did not come close to moderating the influence of income tax on total earnings.

Thus, Experiment 1 provides initial evidence that income tax has different effects on the motivation to work depending on one's attitudes toward the central features of income tax (government intervention and redistribution). For those who are chronically opposed to either redistribution or government intervention, income tax is demotivating (sometimes significantly, sometimes not). For those who are chronically in favor of both redistribution and government intervention, working in the presence of income tax aligns with one's identity and is motivating.

Additionally, Experiment 1 rules out the most obvious potential alternative explanation for our findings, namely that egalitarian and communitarian attitudes just capture the effects of political affiliation. We also assessed the plausibility of two other alternative accounts in a follow-up survey on Amazon Mechanical Turk ( $N = 251$ , 59% female, average age: 34). First, we explored whether High E / High C types are simply people who reject the notion of a "just world" (i.e., a world where people get what they deserve and deserve what they get; Lerner 1982). Benabou and Tirole (2006; cf. Frank, Wertenbroch, and Maddux 2015) proposed that people who reject the notion of a just world are most likely to favor redistribution via income tax, because hard work is presumably not sufficient to raise the less fortunate out of poverty. However, when we regressed belief in a just world scale scores (measured with the Rubin and Peplau 1975 scale) on mean-centered egalitarianism scores, mean-centered communitarianism scores, and their interaction, we found a significant relationship with egalitarianism ( $B = -.03$ ,  $SE = .007$ ,  $t(247) = 3.97$ ,  $p < .01$ ), no relationship with communitarianism ( $p = .20$ ), and, most importantly, no interaction ( $p = .60$ ). Second, we explored whether High E / High C types are simply more masochistic. That is, working in the presence of income tax may be painful, and High E / High C types may enjoy the pain. However, when we regressed benign masochism scale scores (measured with the Rozin et al. 2013 scale) on mean-centered egalitarianism scores, mean-centered communitarianism scores, and their interaction, we found no relationship with egalitarianism ( $p = .86$ ), no relationship with communitarianism ( $p = .36$ ), and, most importantly, no interaction ( $p = .40$ ).

Another possible alternative account is that High E / High C types are essentially "social surplus maximizers," who are happy to generate as much money (for self and others) as possible when given the

opportunity. That is, rather than experiencing the motivational benefits of identity-congruence while working in the presence of income tax, it is possible that High E / High C types were motivated by the opportunity to maximize the sum of money earned for themselves and for others. Theoretically, it is unclear why surplus-maximizers would happen to be strongly in favor of redistribution and government intervention, but based on Experiment 1 alone, we cannot rule out the possibility that High E / High C types were primarily motivated by the opportunity to maximize social surplus. Experiment 2 explores this possibility.

## **Experiment 2**

To test the alternative hypothesis that High E / High C types are essentially social surplus-maximizers, we introduced a condition that allowed participants to generate money for themselves and others in the absence of taxation. This “Match” condition is objectively equivalent to our Tax condition, but rather than taking money from the gross earnings of participants and redistributing it to other people, the Match condition matches a portion of participants’ gross earnings with the experimenter’s money, and distributes it to other people. In other words, Match participants have the same opportunity to generate revenue for other participants, but none of it comes out of their gross earnings. Thus, the Match condition essentially removes both the intervention component (we do not collect money from participants) and the redistribution component (we do not redistribute collected funds to other participants). Our identity-congruence account predicts that the Match condition should not especially motivate High E / High C types. By contrast, the surplus-maximization account predicts that the Tax and Match conditions are equally likely to motivate High E / High C types.

In Experiment 2, we also examine the replicability of the basic Tax  $\times$  egalitarianism  $\times$  communitarianism interaction observed previously. We attempt to increase the generalizability of our findings by examining the effects of a different tax rate: 33% (rather than 50% in Experiment 1). Although both rates are relatively high compared to average U.S. tax rates, they are comparable to average tax rates in some European countries (e.g., Denmark, Sweden). These tax rates are also comparable to rates utilized in prior experimental research (e.g., 50% in Kessler and Norton 2014; 20-80% in Djanali and Sheehan-Connor 2012).

### *Method*

Undergraduates at a large, public Midwestern university (N = 358, 45% female) participated as part of a course requirement. We told participants that they would have the opportunity to earn money by performing a counting task – the same task from Experiment 1. Participants earned \$0.20 for each

acceptable response (within  $\pm 1$  of the correct number), and nothing for unacceptable responses.

Participants could complete up to 20 rounds, and they could choose to stop at any time.

Participants were randomly assigned to one of three conditions. In the Control condition, participants were simply paid \$0.20 for each acceptable response. In the Tax condition, participants were initially paid \$0.30 per acceptable response, but \$0.10 in tax was immediately deducted. As in Experiment 1, we told participants in the Tax condition (in the initial instructions) that their taxes would be redistributed to other students. Specifically, in the Tax condition, we told participants:

Your earnings in this study will be subjected to a 33% tax. The money collected through this tax will go to non-Mkt300 students<sup>7</sup> who participate in different studies with different tasks that do not allow participants to earn money themselves. To reiterate, you will obtain two thirds of your gross earnings for completing the task, because 33% will go towards the tax.

In the Match condition, participants personally earned \$0.20 for each acceptable response. In addition, for each acceptable response, the experimenter allocated \$0.10 to other students. Specifically, in the Match condition, we told participants:

A portion of your earnings in this study will be matched by a payment from us to other students. That is, every time you earn money, we will pay the equivalent of one half of your earnings to other students. These are non-Mkt300 students who participate in different studies with different tasks that do not allow participants to earn money themselves. To clarify, this procedure will not reduce your earnings in any way. Instead, we will use our budget to make these additional payments.

Thus, note that in every condition, participants personally earned \$0.20 for each acceptable response. Also, in both the Tax and Match conditions, each acceptable response also produced \$0.10 for other students. Critically, however, the Tax and Match conditions differ in how that \$0.10 for other students is framed (as a tax or as matched revenue coming from the experimenter). At the conclusion of rounds in which the participant provided an acceptable response, we displayed animations illustrating their payments (see Appendix A). If participants provided an unacceptable response, we simply informed them of that fact (without animation).

At the conclusion of the task, participants completed the short-form of the Cultural Cognition Worldview scale. The mean interitem correlation was .42 for the egalitarianism dimension, and .23 for the communitarianism dimension. Neither egalitarianism scores nor communitarianism scores differed by

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<sup>7</sup> Participants in our experiment were students in a “Mkt300” (introductory marketing) class.

condition (all  $ps > .15$ ). We also administered some exploratory measures (listed in Appendix B), but we focus our analyses on our central predictions.<sup>8</sup>

### *Results and Discussion*

A linear regression of total earnings on a Tax condition dummy (= 1 for Tax condition, = 0 otherwise) and a Match condition dummy (= 1 for Match condition, = 0 otherwise) revealed no main effects our manipulations ( $ps > .25$ ; see Table 3, Model 1). However, a linear regression of total earnings on Tax condition, Match condition, egalitarianism scores, communitarianism scores (both mean-centered), and their interactions revealed a significant Tax  $\times$  egalitarianism  $\times$  communitarianism interaction ( $p < .05$ ; see Table 3, Model 2), as in Experiment 1.<sup>9</sup> Critically, there was no Match  $\times$  egalitarianism  $\times$  communitarianism interaction ( $p = .69$ ). We performed a spotlight analysis to probe both the Tax  $\times$  egalitarianism  $\times$  communitarianism interaction and the (non-significant) Match  $\times$  egalitarianism  $\times$  communitarianism interaction. Specifically, we examined the influence of the Tax and Match treatments on total earnings at high and low levels of both egalitarianism and communitarianism (1 *SD* above and below their respective means; see Figure 2).

At low levels of egalitarianism, tax reduced total earnings (relative to the Control condition) when participants were also low in communitarianism ( $p = .081$ ). When participants were low in egalitarianism and high in communitarianism, the reduction was not significant ( $p = .46$ ). Also, when participants were high in egalitarianism and low in communitarianism, the reduction was not significant ( $p = .14$ ). However, among participants high in both egalitarianism and communitarianism, tax significantly increased total earnings relative to the Control condition ( $p < .01$ ). By contrast, earnings in the Match condition did not significantly differ from earnings in the Control condition at any level of egalitarianism and communitarianism (all  $ps > .25$ ). This suggests that High E / High C types are not simply motivated to maximize social surplus. Rather, they appear to experience the motivational benefits of identity-congruence while working in the presence of income tax.

Follow-up analyses confirmed that the only significant difference between High E / High C types and other participants was in the Tax condition. When we focused on the Control condition only, and regressed total earnings on egalitarianism scores, communitarianism scores (both mean-centered), and their interaction, we found no significant interaction ( $p = .35$ ). Likewise, when we focused on the Match condition only, and regressed total earnings on egalitarianism scores, communitarianism scores (both

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<sup>8</sup> It is worth noting that one of these measures was a trait altruism scale (Rushton, Chrisjohn, and Fekken 1981). This measure did not moderate the influence of our treatments on productivity. Also, when regressing this measure on mean-centered egalitarianism scores, mean-centered communitarianism scores, and their interaction, we found no significant interaction. This argues against simply viewing High E / High C types as particularly generous.

<sup>9</sup> The VIFs for the eleven independent variables ranged from 1.38 to 3.29.

mean-centered), and their interaction, we found no significant interaction ( $p = .18$ ). This indicates that High E / High C types were not especially motivated or demotivated in either the Control or Match conditions. However, when we focused on the Tax condition only, and regressed total earnings on egalitarianism scores, communitarianism scores (both mean-centered), and their interaction, we found a marginally significant interaction ( $B = .58$ ,  $SE = .31$ ,  $t(115) = 1.89$ ,  $p = .061$ ).

### **General Discussion**

Income tax is a salient presence in the lives of many employees. Whether or not employees routinely inspect the tax withholdings reported on their pay stub, the annual need to complete income tax returns and frequent political debates over income tax are likely to prompt employees to consider, from time to time, how income tax influences their take-home pay. Thus, it is important to consider how the presence of income tax influences individuals' motivation to work. Intuition suggests that income tax is unlikely to bolster motivation (Srna, Zauberman, and Schrift 2015). For example, Dan Ariely (2011) observed that “some people think that [raising income taxes] will cause the wealthy to stop working, others think that this will cause everyone to stop working, yet others think that as long as we care about how we do relative to others an increase of the tax rate will have no effect on effort and productivity.”

However, for some people, we found that the presence of income tax can actually enhance motivation and productivity. People whose identities are strongly tied to pro-redistribution and pro-government beliefs worked significantly harder when taxed than when not taxed, presumably because working while taxed was identity-congruent for them (Oyserman 2009). We ruled out the possibility that these participants were simply social surplus maximizers by demonstrating that a wage “match” (objectively equivalent to our wage “tax”) did not motivate them to work harder.

Most participants in our samples were not favorable toward both redistribution and government intervention. Among these participants, income tax reduced motivation and productivity. Thus, pooling across all participants, there was no main effect of the presence of income tax on productivity. Our results suggest that the net effect of income tax on productivity depends on the distribution of attitudes toward redistribution and government intervention in the relevant population. Our conceptual framework may help to explain why previous tax experiments that utilized different samples reached different conclusions about the net influence of income tax on motivation (e.g., Djanali and Sheehan-Connor 2012; Kessler and Norton 2014).

Our work raises several questions worthy of future research. For example, we proposed that the two central features of income tax are redistribution and government intervention, but arguably the “tax” label itself could also be considered a central feature (cf. Hardisty, Johnson, and Weber 2010). It would be useful to examine whether different labels for taxes (e.g., “dues”) help mitigate the productivity

decline among people who are not favorable toward both redistribution and government intervention. It is also worth examining how variance in the salience of income tax influences the motivation to work among different types of employees (cf. Chetty, Looney, and Kroft 2009). Should income tax withholding be made even more salient (e.g., on pay stubs) in High E / High C populations? Might even subtle reminders of income tax reduce motivation among employees who are not favorable toward both redistribution and government intervention? The answers to these questions have important implications for tax policy and consumer welfare.

## Appendix A

Experiments 1 and 2: Sample matrix of zeros and ones

How many zeros are in the table displayed below?

0	1	0	1	0	1	0	1	1	0	0	1	0	0	0
0	1	0	1	0	1	0	1	0	1	1	0	0	1	0
1	0	1	1	1	0	0	0	1	1	0	0	0	1	0
1	1	0	1	0	1	0	0	1	0	0	1	0	1	1
0	0	1	1	0	1	0	1	0	0	1	0	1	1	0
0	1	0	1	0	1	0	0	0	1	0	1	0	1	1
1	1	1	0	1	1	1	1	1	1	1	0	1	0	0
0	0	1	1	0	0	0	1	0	1	0	1	1	0	1
0	1	1	1	1	0	0	1	0	1	0	1	0	0	0
1	0	0	0	1	0	1	0	1	0	0	1	0	1	1

Experiment 1: Sample paychecks (for rounds in which the participant provided an acceptable response)

Earnings this Pay Period			Experiment 6
Rate \$ .20	This Period \$ .20	NET PAY \$ .20	

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Behavioral Lab  
Experiment 6

PAY \*\*\*\*\* Twenty cents \*\*\*\*\* \$ .20

Control condition

Earnings this Pay Period			Experiment 6
Rate \$ .40	This Period \$ .40	Deductions - \$ .20	NET PAY \$ .20

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Behavioral Lab  
Experiment 6

PAY \*\*\*\*\* Twenty cents \*\*\*\*\* \$ .20

Tax condition

### Short-Form of Cultural Cognition Worldview scale (Kahan, Jenkins-Smith, and Braman 2011)

Responses to each item were made on a six-point scale, ranging from Strongly Disagree to Strongly Agree. Responses were coded such that higher scores were indicative of higher egalitarianism and higher communitarianism.

#### Egalitarianism subscale

1. We have gone too far in pushing equal rights in this country. (reverse-scored)
2. Our society would be better off if the distribution of wealth was more equal.
3. We need to dramatically reduce inequalities between the rich and the poor, whites and people of color, and men and women.
4. Discrimination against minorities is still a very serious problem in our society.
5. It seems like blacks, women, homosexuals and other groups don't want equal rights, they want special rights just for them. (reverse-scored)
6. Society as a whole has become too soft and feminine. (reverse-scored)

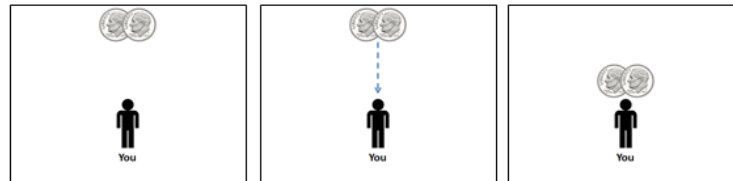
#### Communitarianism subscale

1. The government interferes far too much in our everyday lives. (reverse-scored)
2. Sometimes government needs to make laws that keep people from hurting themselves.
3. It's not the government's business to try to protect people from themselves. (reverse-scored)
4. The government should stop telling people how to live their lives. (reverse-scored)
5. The government should do more to advance society's goals, even if that means limiting the freedom and choices of individuals.
6. Government should put limits on the choices individuals can make so they don't get in the way of what's good for society.

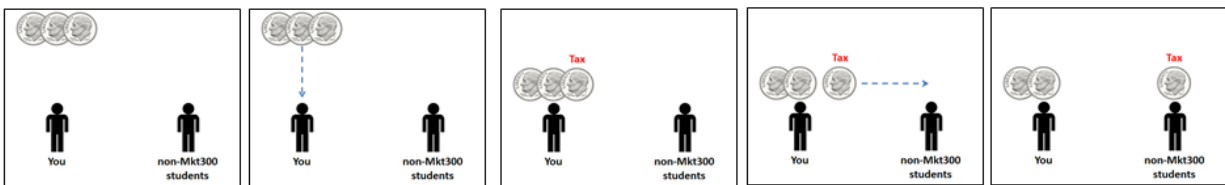


Experiment 2: Payment animations (for rounds in which the participant provided an acceptable response). Dashed arrows represent the movement that was displayed to participants. Participants in this experiment were part of a course (“Mkt300”), participating as part of a course requirement, and tax revenues / matched revenues were allocated to students not currently enrolled in that course (“non-Mkt300 students”).

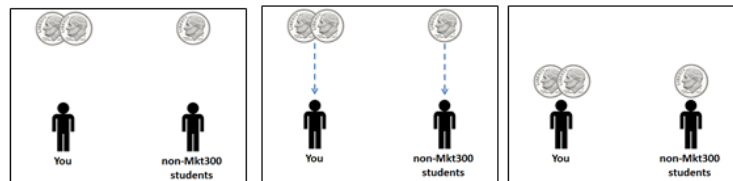
### Control condition



### Tax condition



### Match condition



## Appendix B

### Exploratory measures collected at the conclusion of Experiment 1

*Movie choices (previously utilized as a measure of anger; Gal and Liu 2011)*

In the following screens, you will consider some pairs of movies. For each pair, you must decide which movie you would prefer to watch right now.

Anger Management or Billy Madison  
 Falling Down or The Game  
 Romeo and Juliet or Hamlet  
 Count of Monte Cristo or The Three Musketeers

How difficult did you find the earlier counting task? [1-7 scale, where 1=Very Easy and 7=Very Difficult]

What do you think the purpose of the counting study was? [open-ended]

### Exploratory measures collected at the conclusion of Experiment 2

How difficult did you find the counting task? [1-7 scale, where 1=Very Easy and 7=Very Difficult]

*Modified version of the Inclusion of Other in the Self Scale (Aron, Aron, and Smollan 1992)*

Please think about the relationship between you and other students, and select the picture below that best represents it.

7-point scale, ranging from  to 

*Self-report altruism scale (Rushton, Chrisjohn, and Fekken 1981)*

Please check the category that conforms to the frequency with which you have carried out the following acts. [5-point scale, ranging from 1=Never to 5=Very often]

- I have helped push a stranger's car out of the snow.
- I have given directions to a stranger.
- I have made change for a stranger.
- I have given money to charity.
- I have given money to a stranger who needed it (or asked me for it).
- I have donated goods or clothes to a charity.
- I have done volunteer work for a charity.
- I have donated blood.
- I have helped carry a stranger's belongings (books, parcels, etc.).
- I have delayed an elevator and held the door open for a stranger.
- I have allowed someone to go ahead of me in a lineup (at a photocopy machine; in the supermarket).
- I have given a stranger a lift in my car.
- I have pointed out a clerk's error (in a bank; at the supermarket) in undercharging me for an item.

I have let a neighbor whom I didn't know too well borrow an item of some value to me (e.g., a dish, tools, etc.).

I have bought "charity" Christmas cards deliberately because I knew it was a good cause.

I have helped a classmate who I did not know that well with a homework assignment when my knowledge was greater than his or hers.

I have before being asked, voluntarily looked after a neighbor's pets or children without being paid for it.

I have offered to help a handicapped or elderly stranger across a street.

I have offered my seat on a bus or train to a stranger who was standing.

I have helped an acquaintance to move households.

How would you describe yourself politically? [Democrat / Republican / None of the above]

What do you think the purpose of the counting study was? [open-ended]

#### Appendix B References

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**Table 1: Unstandardized Coefficients from Regressions Predicting Total Earnings, Experiment 1**

	Model 1		Model 2	
	B	SE	B	SE
Intercept	85.69**	(8.07)	88.49**	(8.29)
Tax condition	-8.94	(11.40)	-17.98	(11.68)
Egalitarianism			-3.70	(1.99)
Communitarianism			0.70	(1.58)
Egalitarianism × Communitarianism			-0.33	(0.36)
Tax × Egalitarianism			9.09**	(3.11)
Tax × Communitarianism			1.44	(2.36)
Tax × Egalitarianism × Communitarianism			1.52**	(0.55)
N	233		233	
R <sup>2</sup>	0.003		0.071	

Note: \*\*  $p < .01$ . Tax condition is a dummy variable (1=Yes, 0=No).

**Table 2: Unstandardized Coefficients from Regressions Predicting Egalitarianism Scores, Communitarianism Scores, and Total Earnings, Experiment 1**

	DV: Egalitarianism Score		DV: Communitarianism Score		DV (Models 3-5): Total Earnings					
	Model 1		Model 2		Model 3		Model 4		Model 5	
	B	SE	B	SE	B	SE	B	SE	B	SE
Intercept	17.81**	(0.44)	22.44**	(0.54)	84.44**	(10.29)	88.33**	(10.29)	89.00**	(13.81)
Democrat	3.44**	(0.58)	6.21**	(0.70)	3.28	(16.70)			-1.27	(19.09)
Independent	2.32**	(0.63)	3.35**	(0.76)			-9.58	(18.08)	-10.25	(20.72)
Tax condition					-5.66	(14.87)	-17.58	(13.60)	-24.17	(21.31)
Tax × Democrat					-7.95	(23.32)			10.56	(27.88)
Tax × Independent							28.56	(25.02)	35.15	(29.98)
N	233		233		233		233		233	
R <sup>2</sup>	0.133		0.253		0.003		0.009		0.010	

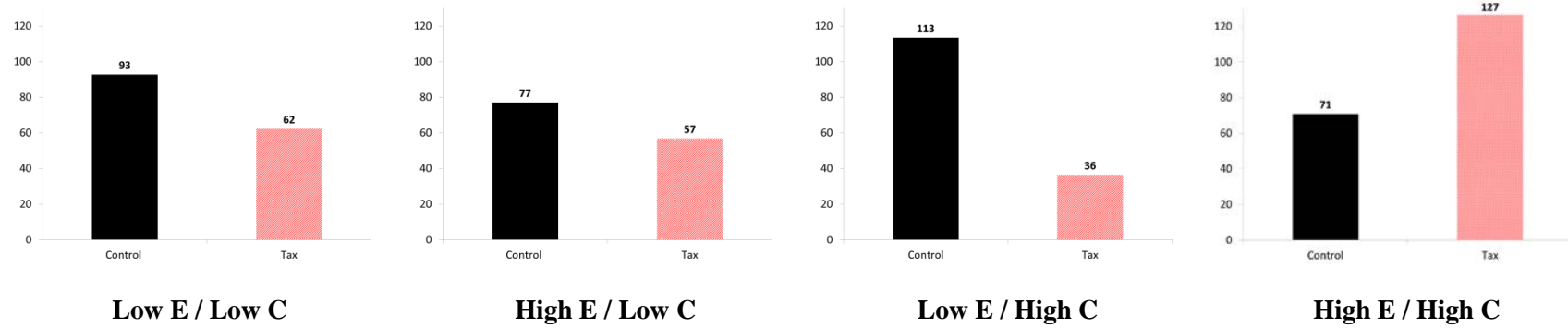
Note: \*\*  $p < .01$ . Democrat, Independent, and Tax condition are dummy variables (1=Yes, 0=No).

**Table 3: Unstandardized Coefficients from Regressions Predicting Total Earnings, Experiment 2**

	Model 1		Model 2	
	B	SE	B	SE
Intercept	61.35**	(7.07)	62.10**	(7.19)
Tax condition	-3.53	(10.00)	-5.74	(10.08)
Match condition	-10.68	(9.97)	-8.51	(10.35)
Egalitarianism			-0.38	(1.29)
Communitarianism			-3.00	(1.69)
Egalitarianism × Communitarianism			-0.21	(0.21)
Tax × Egalitarianism			2.95	(1.90)
Tax × Communitarianism			6.05*	(2.55)
Tax × Egalitarianism × Communitarianism			0.79*	(0.38)
Match × Egalitarianism			-1.02	(1.81)
Match × Communitarianism			2.83	(2.79)
Match × Egalitarianism × Communitarianism			-0.14	(0.34)
N	358		358	
R <sup>2</sup>	0.003		0.045	

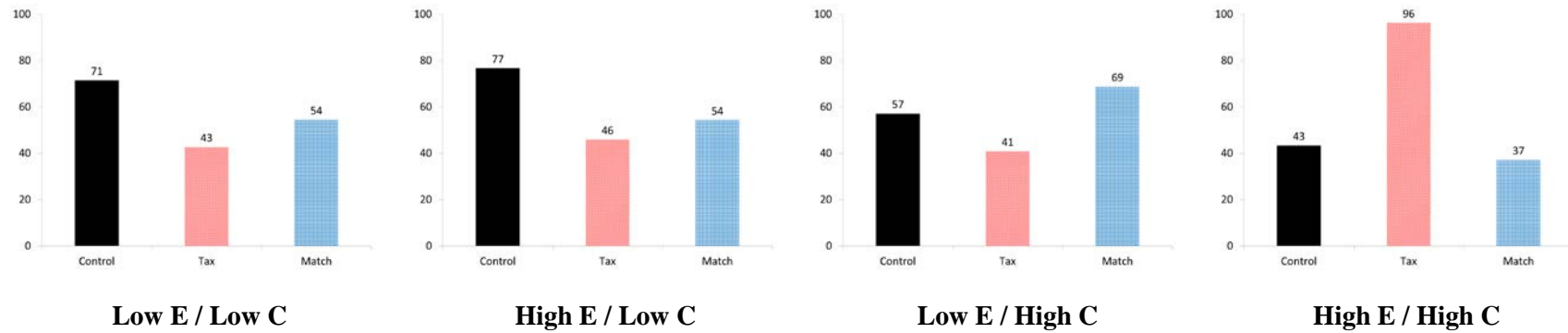
Note: \*\*  $p < .01$ , \*  $p < .05$ . Tax condition and Match condition are dummy variables (1=Yes, 0=No).

**Figure 1: Spotlight analysis of total earnings (in cents), Experiment 1**



Note: These are predictions of the model at 1 *SD* above and below the mean levels of egalitarianism and communitarianism.

**Figure 2: Spotlight analysis of total earnings (in cents), Experiment 2**



Note: These are predictions of the model at 1 *SD* above and below the mean levels of egalitarianism and communitarianism.



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