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Experimental Analysis of Framing Effects and the Perception of Fair Taxation

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Description of approach and own contribution

	Self	Supervisor	Others	NA	Explanation
Research idea/research question					
Defining and formulating research question/	✓				
Literature study					
Search and collect sources	✓				
Primary data collection					
Composing questionnaires	✓				
Define/search for research objects	✓				
Conduct interviews/ experiment	✓				
Collection of secondary data					
Data collection (e.g. download from website/ database)	✓				
Analysis					
Prepare dataset (e.g. put in correct format)	✓				
Analysis (regression analysis, qualitative data analysis, methodology...)	✓				

Clarify the sources of your reference list. Please indicate in the table below the number of each type of source that you have used.

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Abstract

Contrary to a key assumption in neoclassical economics the growing insights from the behavioural economics sub-discipline stress that people do not always decide rationally. In this study, we focus on the experimental analysis of several different framing effects and their impact on the perception of fair taxation. The income level of a person is still an important factor to shape the perception of fair taxation. However, different frames can change this perspective.

Keywords: Framing Effect, Perception of Fair Taxation, Tax Progressivity, Experimental Analysis of Framing Effect

1. Introduction

Contrary to a key assumption in neoclassical economics, people do not always decide entirely rational; the growing insights from the behavioural economics sub-discipline stress that people do not always decide rationally. This study will focus on the experimental analysis of framing effects and perception of fair taxation. The framing effect is a well-documented type of cognitive bias that changes an individual's decision or judgment depending on how a statement or information is presented. (Plouse, 1993) Thus, analysing the framing effect is essential to understand the decision mechanism of people. We can see the impact of the framing effect in many decision processes. One of the areas in which its impact has been demonstrated is in the taxation decision process.

In today's world, the fair division of taxation among taxpayers and the desired extent of tax progressivity are essential discussion topics. Different perceptions of fair taxation shape the taxation policies of different countries. We need to consider the concepts of vertical and horizontal fairness to understand the perception of fair taxation. Vertical fairness suggests that the wealthier citizens should be liable to pay a relatively larger tax burden. (Kloss et al. 2017). On the other hand, horizontal fairness suggests that taxpayers with equal taxable capacity bear the same burden. (Chittenden et al.,2008). We can observe both perspectives of fairness when legal authorities determine the taxation regulations.

In our experimental analysis, we will focus on how different frames can impact the perceived fairness of taxation. The participants will receive different scenarios and eleven questions about two couples (Adam & Barbara and Carter& Diana). The participants will receive the questions in different frames. We will measure how similar questions in various frames can be perceived differently by participants. As a result, we will reveal the perception of fair tax of the selected group and how the framing effect impacts the fairness perceived for taxation.

2. Literature review

The framing effect and its impact are studied in Tversky and Kahneman's famous contribution and introduces their well-known Asian disease framing problem (Tversky & Kahneman, 1981). In this framing problem, Tversky and Kahneman describe an experimental set-up in which a set of participants is confronted with the question to state a preference among two different policy programs to combat a dangerous disease. Participants are randomly divided into two groups, where each group is confronted with a somewhat different scenario. The first scenario suggests that the USA is getting ready for a deadly Asian disease that could kill 600 people. The scenario then suggests two alternatives; if participants choose Program A, 200 people will be alive. If participants choose Program B, there is a probability that 1/3 of all 600 people will be alive or 2/3 of everyone dying. When confronted with this scenario, 72% of the participants chose Program A. The second scenario also suggests that the USA is preparing for a deadly Asian disease that could kill 600 people. However, this time, there are two other alternatives. If participants choose Program C, 400 people will die. If participants choose Program D, there is a probability that 1/3 of 600 people will be alive or 2/3 of everyone dying. Only 22% of the participants chose Program C.

Participants violated the subjective expected utility theory in this scenario. "Subjective Expected Utility (SEU) is an approach to decision making under risk that allows for subjective evaluation of both the variables under consideration and the probabilities associated with them." (Shanteau & Pingenot, 2009). When we compare program A and Program C, actually both programs have the same probability of saving human lives. However, 72% of the respondents chose Program A, while only 22% chose program C. We can explain this phenomenon by using prospect theory.

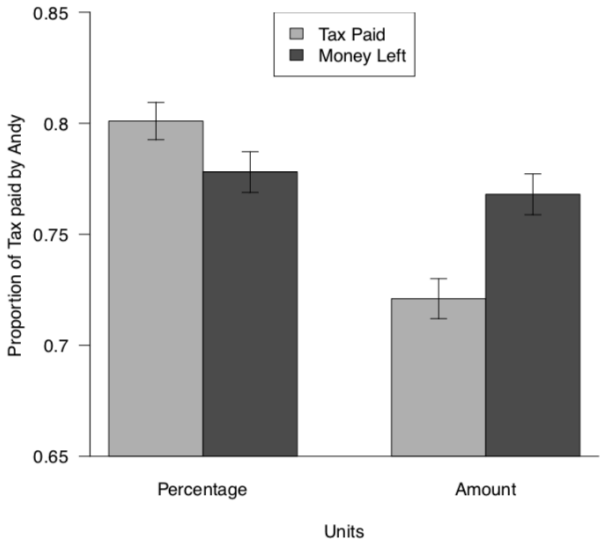
Until 1970 it was believed that irrational behaviour could not be modelled. In 1979, Tversky and Kahneman provided the prospect theory. According to prospect theory, people tend to choose the risk-averse option in the domain of gains and the risk-seeking option in losses. This experiment is crucial to understanding the influence of the framing effect. When the options are framed as saving human lives (gaining frame), participants tend to choose the risk-averse option, while the options are framed as losing human lives (loss frame); participants tend to choose the risk-seeking option. As a result of the experiment of Tversky and Kahneman, we can conclude that when people make a decision, they are not always entirely rational. Therefore, considering the expected utility theory as the only source for analysing human decisions is insufficient.

The finding of Kahneman and Tversky has been generalised to many settings; studying how a question or a situation is framed can impact deciding. We can see the impact of the framing effect on many people's decisions. In this study, we focus on the impact of the framing effect on taxation decisions.

Several studies exist on the impact of the framing effect on taxation preferences. Reimers' experiment (2009) reveals how fairness and support for tax progressivity change when the same question is given in different frames. In his study, participants received the information that "Andy earned £50,000 before tax and Bob earned £20,000 before tax and that the total amount of tax to be paid between two of them would be £19,000." (Reimers, 2009). Participants were asked to split the tax between Andy and Bob according to their perception of fairness. Every participant then received one of the differently framed questions. (Reimers, 2009). Participants with "money left" framing were given the following question: "How much do you genuinely believe Andy and Bob should each have once they

have paid tax?" Furthermore, given this question, a further difference was made in framing the 'units' in which participants could respond: the desired after-tax income of Andy and Bob was either to be stated as an absolute amount or as a percentage of original income. Participants with "tax paid" framing were given the question: "How much do you genuinely believe Andy and Bob should pay respectively?" (Reimers, 2009). Again, with this question, there was a further variation depending on whether the response was given in absolute amounts or in percentage terms. Even though there is no change in income levels of Andy and Bob and the questions are intrinsically similar, different frames had significant impacts on the participants' answers. Specifically, participants tended to be more supportive of tax progressiveness when the tax was framed as percentages. (Figure 1) We will also test whether this finding holds in our survey and thus suggest Hypothesis 1 as "*H1: Participants will be more supportive of tax progressivity when the tax payment is framed in percentages rather than in monetary units.*" In addition, people chose more progressivity when thinking about income after tax in the monetary unit rather than the amount paid in the monetary unit. (Figure 1) (Reimers, 2009) In our survey, we will similarly suggest Hypothesis 2 *"H2: Participants will be more willing to support tax progressivity when they determine the retained income after tax in monetary units than tax paid in monetary units"* Thus, we can expect that Reimers' experiment will support our hypothesis 2.

Figure 1: Proportion of tax paid by Andy



Proportion of tax paid by Andy in participants' preferred split, as a function of the units used to describe Andy and Bob's contribution (percentage of income or amount in pounds), and framing (tax paid or money left after paying tax). (Reimers, 2009)

Besides our first two hypotheses, we will analyse other results from the Reimers' study. As we can see from the graph above, when tax paid and retained income after tax is given in percentage units, the participants were more in favour of tax progressivity for the tax paid in percentage units. (Figure 1) Based on this information, in our survey, we suggest Hypothesis 3 "H3: Participants will be more tax progressive when they determine the tax paid in percentages rather than in retained income percentage units".

Last but not least, in Reimers (2009), we cannot observe a significant preference difference when the participants decide on the tax paid or retained income after tax in the monetary unit. (Figure 1) In our study, we will suggest similarly that ""*H4: Participants will be indifferent in terms of tax progressivity when they determine retained income in monetary units or retained income in percentage units."* Other aspects of the taxation process have similarly been studied from the framing perspective. Bergan and Risner (2016) designed two different experiments to analyse the impact of framing tax increases in various goods on individuals' support for the tax increase.

In their first experiment, the participants are asked to indicate how they would like to support a tax increase for public transportation. The conditions included $40 per year (yearly=monetary), the monetary value of one night at the movies for two people including tickets, popcorn, and pop per year (yearly=hedonic), 77¢ per week (weekly= monetary), and one candy bar per week (weekly=hedonic) (Bergan & Risner, 2016). Risner and Bergan wanted to test the hypothesis that "People will be more willing to support a tax increase when it is framed as a hedonic good compared to a monetary amount of equal value." (Bergan & Risner, 2016). As a result of the experiment, the participants indeed tend to be more tax supportive when the tax is framed as a hedonic good instead of a monetary unit. Thus, framing the tax amount solely in monetary units is not as effective as hedonic goods. We can conclude that hedonic good framing appeals more support for taxation if we want to increase the tax support.

The second experiment was parallel to the first one but with more conditions. Risner and Bergan wanted to test if framing a tax increase as a good (utilitarian or hedonic) impacts the support for a tax increase. One of the main differences between the first and second experiments was measuring the impact of the type of good on tax supportiveness level. Hedonic goods provide more fun, excitement and pleasure, while utilitarian goods are functional and instrumental. (Dhar & Wertenbrouch 1999) Hedonic value is related to "want" preference, and utilitarian value is related to "should" preference. (Dhar & Wertenbrouch, 1999) Risner and Bergan suggested that " Framing a tax increase in terms of items (hedonic or utilitarian) will be more effective at eliciting tax support than sharing a monetary amount." (Bergan & Risner, 2016) and " Framing a tax increase as hedonic items will be more effective at eliciting tax support than framing a tax increase as utilitarian items." (Bergan & Risner, 2016) As a result, the data provided from participants supported their first suggestion. However, the impact of the type of good on tax support was not significant. From the results, we can understand that framing a tax as a good will increase the tax supportiveness level, while the type of the good does not have a significant impact.

We were inspired by Risner and Bergan's study for our survey. We understand that framing a tax as a good can increase the support for a tax increase. Also, we want to see if framing taxation as hedonic or utilitarian goods may impact the tax progressivity level. Accordingly, in our study, we will suggest hypothesis 5, *“H5: Participants' willingness to support for tax progressivity will not change significantly due to type of a good (hedonic vs utilitarian).”*

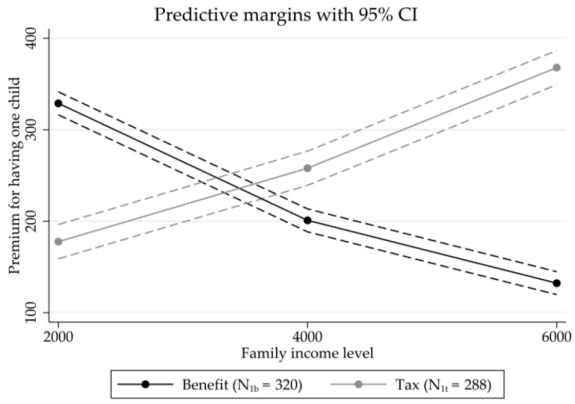
In Kuehnhanss and Heyndels' study (2018), we can see a similar impact of the framing effect on support for tax progressivity like in Reimers' (2009) study. In Reimers' study, we saw that different framings of questions (money-left/ tax-paid) and different units (amount/percentage) impact the tax progressivity for different income level individuals. Again, in Kuehnhanss and Heyndels' study, we can see different question framings (with their first child/ without children). However, they use social premium frames instead of a different unit framing (tax/benefit). An essential function of tax and benefit is creating social premiums for certain behaviours or actions. (Heyndels & Kuehnhanss, 2018) In the experiment, each group of participants received the information “that “In Belgium, couples receive financial benefits from the state. Suppose that it is not relevant how the transfer is funded, and ignore any other benefits, which might come into play.” Next, one group of participants received the question

“How much [*more*] should a couple [*with their first child*] receive per month than a couple [*without children*]” While the other group of participant received the question as “How

much [**less**] should a couple [**without children**] receive per month than a couple [**with their first child**]"

The respondents were asked to determine an appropriate amount for every three couples with different net incomes: €2,000, €4,000, or €6,000. As a result of the experiment, the amount of tax increased with the family's income in the bold font (tax frame) of the question. In the italic font (benefit frame) version of the question, the benefit was decreasing with the family's income. (Figure 2) (Heyndels & Kuehnhanss, 2018) However, the low-income (€2,000) couple has received an average of €330 in the benefit frame, but only €178 in the tax frame. (Figure 2) (Heyndels & Kuehnhanss, 2018) From this result, we can understand that when the benefit frame is used for low-income people, tax progressivity is higher. For the high-income (€6,000) couple, the amounts received on average €132 in the benefit frame, but a much higher €368 in the tax frame. (Heyndels & Kuehnhanss, 2018) From this result, we can conclude that when the tax frame is used for the high-income level couple, the tax progressivity is higher.

Figure 2: Results Child Scenario

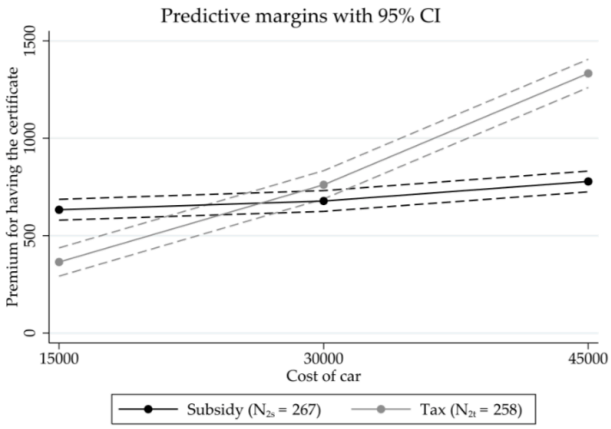


Premium for having a child scenario (Heyndels & Kuehnhanss, 2018)

Based on this experience, in our survey, we want to analyse whether framing questions in different benefit levels may also impact the preference for tax progressivity. As Hypothesis 6, we suggest that *"H6:Participants' perception of fair taxation will change if one of the couples (Adam & Barbara or Carter & Diana) benefit more from a good."*

Kuehnhans and Heyndels additionally focus on how fairness perception and the support for tax progressivity can change when the action of a person may create an external effect. Specifically, participants in their study received information on "the introduction of a new environmental certification for cars in Belgium". They were asked to determine the amounts they would consider suitable for the difference in annual tax payment on cars (cost of the cars: €15,000, €30,000, and €45,000, respectively) with or without the certification" (Heyndels & Kuehnhanss, 2018). One of the group received the question of "how much less the owner of a certified car should have to pay in annual car tax than the owner of a non-certified car (the subsidy frame)" (Heyndels & Kuehnhanss, 2018). Another group of participants received the question of "how much more the owner of a non-certified car should pay in annual car tax than the owner of a certified car (the tax frame)" Suppose we take the most expensive car (which costs €45,000) as an example. The subsidy determined for the most expensive car with an environmental

Figure 3: Results Car Scenario



Premium for having a car with a certificate (Heyndels & Kuehnhanss, 2018)

certification is €778, while the tax determined without an environmental certification is €1,333. As we can see from the results, when a tax frame is used, the support for progressivity is more than the subsidy frame. Participants determine a higher tax amount for a car without certification. (Figure 3)

However, participants grant less subsidy amount to a car with eco-certification than the tax deducted for a car without certification. (Figure 3) From this result, we can understand that, according to the fairness perception of participants, an individual must respect the environment. Therefore, a person should not be awarded just for fulfilling his responsibility. However, if a person does not respect the environment, that action should be punished according to participants' fairness perception. Based on this experiment, in our survey, we suggest our Hypothesis 7, *"H7: Perception of tax fairness will change if a purchase (a good or service) has negative external impacts".* In (Heyndels & Kuehnhanss, 2018), we see that participants determine a higher tax amount for a car without certification. Our survey expects a similar result that participants' preference will be lower for tax progressivity if an individual's purchase harms the environment. As we see in Kuehnhanss and Heyndels' experiment, individuals tend to be less progressive when the consequences of action harm other people in society. However, people tend to be more tax progressive in some social situations.

Marital situation and having children are two phenomena that significantly impact the perception of horizontal fairness for taxation. In many countries, marriage can grant some form of tax exemption and having children can give some tax bonus.

Baron & McCaffery (2004) analyzed the impact of marriage and having children on tax preferences. In the experiment, participants were given the information "A married couple with one income of $25,000 pays $3,000 in taxes. The same income earner, if not married, would pay a surcharge of $2,000. A married couple with one income of $100,000 pays $30,000 in taxes. The same income earner, if not married, would pay a surcharge of $6,000." (Baron & McCaffery 2004) Participants are asked to evaluate the fairness level of the surcharges. (Figure 4)

The participants needed to decide how to fairly surcharge a person not being married. Participants consider surcharges for low-income level individuals unfair. Also, the participants consider the surcharges for the high-income level individual too little. (Baron &

Figure 4: Experiment (Baron & McCaffery, 2004)

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

Questionnaire experiment-1
(Baron & McCaffery, 2004)

Figure 5: Experiment (Baron & McCaffery, 2004)

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

Result table for experiment - 3(Baron & McCaffery, 2004)

McCaffery 2004) However, being single had a limited effect on the perception of tax fairness. The financial situation of the individuals dominated the fairness perception of participants more than the marital situation.

Figure 6: Experiment (Baron & McCaffery 2004)

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

Result table for experiment - 3 (Baron & McCaffery 2004)

As a follow-up experiment, the participants were given three types of households (single, married couples with equal income, married couples with unequal income, married couples with one earner) with and without children. Each household type has a different version of income level; $ 25.000, $ 50.000, $ 100.000 and $ 200.000. The participants are demanded to write down the fair tax amount (both in percentage and monetary unit) they think is appropriate for the respective family type and income level. (Figure 5), (Figure 6)

As we can see from the results, the income level of people still dominates the fairness perception of participants. However, the results revealed that having children has a significant impact on the fairness perception of participants. In both given tax rates in percentage or monetary unit, the participants preferred progressive taxation for families with children. Based on this experiment, we suggest Hypothesis 12 "*H12: Participants' fairness of tax perception will change if one of the couples (Adam & Barbara and Carter&Diana) need more assistance for a situation*." Having children is a great responsibility and brings a heavy financial burden. Therefore, in our experiment, we consider having a newborn baby as a situation in need of assistance.

We want to measure that if the case of need of assistance for a newborn baby will impact the preference of tax progressivity. Nationality, gender, age, occupation, background, and many other external and internal factors may impact the fairness perceived. Thus, we can receive different results from different people despite using the same frames. Comparing both the Edlund (2003) and Blaufus et al. (2013) studies, we can understand how different nationalities react to similar frames. In both types of research, the participants were asked to determine the fair income tax amount for different people from various income levels. In Edlund (2003), the participants were from Sweden, and in Blaufus et al. (2013), the participants were from Germany. The nationality difference of the participants created significant results. In Edlund (2003), the participants estimated tax rates close to actual tax rates. The preference for tax progressivity was higher in Swedish participants. On the other hand, in Blaufus et al. (2013), the participants estimated tax rates different from actual rates. The preference for tax progressivity was less in German participants. We can explain this with the perception of fairness of different nationalities. Sweden is a welfare state whose citizens need to pay heavy taxes for social programs. Thus, Swedish society is familiar with tax progressively and understand the necessity of fair taxation to keep the social benefits. Thus, the support for tax progressivity in Swedish society is more than the support in German society. We may consider that the support for tax progressives in welfare states is robust, but we need more experiments to accept it as a norm. However, it is evident that demographic differences may impact the perception of fairness, and highly similar frames can give different results in different geographies.

In addition to them, as we can see from Blaufus et al. (2013), when people are more educated, they support tax progressivity more. The higher the education, the higher the

probability that the actual tax burden was accurately estimated. (Blaufus et al. 2013) Therefore, we consider that education level and tax progressivity can have a positive correlation.

In Roberts et al. (1994), we can see how an informed person decides differently from an uninformed person for tax progressivity. The research consists of five experiments that measure the impact of the framing effect on tax preferences. In one of the experiments, the participants have received questions in different frames; abstract and concrete. An example for the abstract question is, "Are progressive tax rates are more or less fair than flat tax rates?" (Roberts et al. 1994). In concrete questions, participants are asked how much a hypothetical taxpayer should pay compared to another taxpayer. (Roberts et al. 1994) However, one of the groups received the following information "*Definitions: Most people do not fully understand what is meant by progressive tax rates. In a progressive tax, a higher income is taxed at a higher rate. For example, a $10,000 income might be taxed at 10 per cent, or $1,000, while a $30,000 income would be taxed at more than 10 per cent."* (Roberts, 1994). As result of the experiment, the information given to participants has a moderating effect on the inconsistencies due to framing. (Roberts et al. 1994) . When we consider the study of (Edlund 2003) and (Roberts 1994), we can understand that receiving information may impact the preference for tax progressivity. Based on (Edlund 2003) and (Roberts 1994), we will analyse if more information about the background of Adam & Barbara and Carter & Diana (the fictitious couples used in our own survey) will impact the fairness perception of participants. We will give extra information that participants do not know about our experiment in the last question. We will analyse if their preferences for tax progressivity will change when the participants know more extensive knowledge like in Roberts (1994) and Edlund (2003) 's experiments.

3. Data and method(s)

3.1 Previous Experiments

In the previous experiments, various channels were used to collect information, such as; interviews, phone calls, online forms and face-to-face surveys. In some experiments, *between subject survey design* was used. For example, in (Heyndels & Kuehnhanss, 2018) participants received the following question. "In Belgium, couples receive financial benefits from the state. Suppose that it is not relevant how the transfer is funded, and ignore any other benefits, which might come into play. How much [*more*/ **less**] should a couple [*with their first child* / **without children**] receive per month than a couple [*without children*/ **with their first child**]" (Heyndels & Kuehnhanss, 2018). One of the groups of participants received the questions with italic form (benefit frame), and the other group received the question with bald form (tax frame). One of the groups of participants received the questions with italic form (benefit frame), and the other group received the question with bald form (tax frame). In a between-subject design, each participant has received only one treatment. With these types of design, group assignment is random, and estimations are obtained by comparing behaviours of those in one experimental condition with behaviours of those in another. (Charness, 2012) In some experiments, *within-subject design* is used. For example, in Edlund's experiment, all participants received the question, "How much a person with a monthly income of SEK 13,000 should pay in tax (Edlund, 2013). In within-subject design experiments, all participants receive the exact format of the questions. With this type of

design, if the multiple exposures are independent, estimations can be obtained by examining how participants' behaviour changes when the circumstances of the experiment change. (Charness, 2012)

Figure 7: Methods Used in Previous Studies

Author	Medium of experiment	Design Style	Total Participants	Hypothesis Related
Reimers (2009)	**Online**	**Between Subjects**	Study 1: 384	**H1, H2**
Bergan &Risner (2016)	**Phone Survey**	**Between Subjects**	Study 1: 1000 Study 2: 600	**H3**
Heyndels & Kuehnhanss (2018)	**Online**	**Between Subjects**	Study 1 : 608 Study 2: 525	**H4**
Baron & McCaffery (2004)	**Online**	**Within Subjects**	Study 1: 100	**H8**
Edlund (2003)	**Postal Survey**	**Within Subjects**	Study 1:1311	**H9**
Roberts et al. (1994)	**Face-to-Face Survey**	**Between Subjects**	Study 1: 62 Study 2: 98 Study 3: 48 Study 4: 72 Study 5: 23	**H9**
Blaufus et al. (2013)	**Interview**	**Within Subjects**	Study 1: 1009	**H9**

3.2 Design and Procedure of Our Survey

In our experiment, participants were given 11 questions about two couples, Adam & Barbara and Carter & Diana (in the Turkish version of the survey Ali & Beril and Cihan & Deniz). Each participant received the questions 1, 2, 8 and 9 in different frames; tax paid in (monetary unit frame), tax paid in (percentage unit frame), retained income in (monetary unit frame) and retained income in (percentage unit frame) Each participant received the questions 4, 5, 6, 9, and 10 in monetary unit frame or percentage unit frame. In questions 1, 3, 4, 5, 6, 7, 8, and 10, we used the multiple-choice format. In questions 2 and 9, we used a slider format. In the final question, we used the net promoter score, 1-10 scale format. In the introductory part of the survey, we asked participants about their background (education, age, financial situation etc.)

In the first part of the survey, all participants received the same text "*Consider the following situation; There are two couples: Adam & Barbara and Carter & Diana. Adam &*

Barbara together earn 50.000€ per year (with each of them earning the same amount, i.e., 25.000€ each per year). Carter & Diana together earn 100.000€ per year (again, each of the two earns 50.000€ per year). The government decides to increase income taxes. For both couples taken together, the total extra revenue for government collected from should be 30.000€. This total tax amount should be divided between Adam & Barbara and Carter & Diana."

As the first question, we asked participants to determine the tax amount for each couple in multiple question format. Under each following question, we added the text "(There is no change in the total income level of the couples. Adam & Barbara still earn 50.000€ per year and Carter & Diana earn 100.000€ per year.)" as a reminder for the participants.

In the second question, we want them to determine the tax amount manually for each couple by using a slider. Each participant determines the tax amount for Adam & Barbara or Carter & Diana but not for both. To keep the survey compact, we just ask participants to determine the tax amount for one couple.

In the third question, all participants received the same scenario: *"Adam & Barbara and Carter & Diana live in the same street. Because of a recent wind storm, the traffic light in the busiest part of their street is broken. The contribution that both couples together need to pay in order to fix the traffic light is 500€. Both couples benefit equally from this traffic light."* We asked participants to divide the contribution of 500€ between two couples for a traffic light.

As the fourth question, the participants received, "*Now consider a scenario in which the local authority plans to build a new tennis court next to the street where both couples live. Both Carter & Diana and Adam & Barbara are very sportive and play tennis nearly every day. The contribution amount that both couples need to pay for the tennis court is 500€ "*The participants are asked to divide the contribution of 500€ for a tennis court. In the fifth question, the scenario was the same, but Adam & Barbara benefited from the tennis court more than Carter & Diana. In the sixth question, the scenario was again the same, but this time Carter & Diana benefited from the tennis court more than Adam&Barbara.

In the seventh question, participants received a different scenario as "*Consider the following situation; Both couples have a car, which they bought at the same time, and which cost the same for the two couples (15.000€). Adam & Barbara chose a car which is not very eco-friendly. On the other hand, Carter & Diana did consider the environmental impact before buying their and, as a result, Carter & Diana chose an eco-friendly car. In the street where both couples live, all cars need to pay a specific amount of fee to the municipality for parking their cars on the street. For both cars taken together, the total annual fee is 500€. Again, the question is how this total needs to be divided between the both couples. "*We asked participants to divide the annual fee of 500€ between two couples, taking into account that Adam & Barbara's car is not as eco-friendly as Carter & Diana's car. Till the seventh question, we asked participants to determine, tax amount, contribution or fees that both couples needed to pay.

In the eighth question, we changed our perspective and asked our participants to determine the tax refund amount. As the eighth question, the participants received, "*The previous questions all dealt with paying taxes or contribution fees. The last two scenarios that I ask you to consider are concerned with receiving money from the government. Here is the first, the government decides to implement a new tax refund policy. In total 30,000€ tax refund should be divided between Adam & Barbara and Carter & Diana. Again, the government's computer program proposes a few tax refund schedules, which are listed below. Which tax refund schedule should government follow for providing a fair tax refund between couples?"* As we have mentioned before, each participant received questions 1, 2,

8 and 9 in 4 different frames. In the eighth question, each group of participants determined the tax refund amount in tax refund received (monetary unit frame), tax refund received (percentage unit frame), income after tax refund (monetary unit frame) and income after tax refund (percentage unit frame) In the ninth question, we want our participants to determine tax refund manually for each couple by using the slider. To keep the survey compact, we asked participants to determine the tax amount just for one couple.

In the tenth question, all participants received the same scenario as "*Here is the final scenario I ask you to consider; Both Barbara and Diana have a newborn baby. This means they can both benefit from a tax exemption. For both couples taken together, this exemption is 500€. Diana is having a hard time after giving birth. She needs time to recover herself both mentally and physically. Thus, she will need babysitting services, which will generate an extra cost. Barbara does not need any newborn related service."* We asked participants to divide the tax exemption of 500€ between two couples, taking into account that Carter & Diana needs more babysitting services than Adam&Barbara.

As final question, all participants received the same scenario "*The concluding question is a general one, and it provides you with some additional information about the two couples; Barbara and Diana are sisters, while Adam and Carter are brothers. When the four of them were young, they all had the same opportunity for accessing education. They all had similar talents and the same financial support from their parents. However, Carter & Diana have been working hard throughout their life. They are still working full time, are saving a lot for their future, etc... Adam & Barbara work part-time, spend most of their earnings (and hence save less for their future). While both of them are both capable of earning more, they deliberately choose to have a more relaxed life than their hardworking sister and brother."* We asked participants to evaluate the fairness of their answer, taking into account that Carter & Diana is more hardworking than Adam & Barbara and the primary reason for the lower financial situation of Adam & Barbara is their less willingness to work hard. We used a net promoter score and asked participants to evaluate the fairness of their answer on a 1-10 scale.

3.3 The Participants

Figure 8: Distribution of Participants

Distribution of Participants (q = 250)						
Age	18-24 %51.6	25-34 %17.6	35-44 %16.4	45-54 %10	55-64 %3.6	More than 65 %0.8
Gender	Women %58		Men %41.2		Not identify %0.8	
Education	Elementary School %1.6	Secondary School %0.4	High School %11.6	Bachelor Degree %65.2	Master %15.2	PHD %6
Job Status	Employed %37.6		Unemployed %12.4		Student %50	
How satisfied are you with your current financial situation?	Satisfied %18.4		Not Satisfied %76.8		Neutral %4.8	
If you would suddenly lose your main source of income, how long can you continue to keep your current living standards without borrowing any money?	Less than a week %21.2	Less than a month %26.4	Less than 6 months %20.8	Less than a year %8	More than a year %12.4	Do not know %11.2
When you compare your own financial situation with that of other people in your origin country, how do you consider your financial situation?	Average %48.8		Below Average %27.6		Above Average %23.6	

A total of 250 individuals participated in our survey. 247 of the participants answered all questions while 3 of them answered partially. We used both English and Turkish versions of the survey. The Turkish version of the survey was distributed to the Turkish-speaker people, while the English version of the survey was distributed to all non-Turkish speakers. We received survey results from Canada, the United States of America, the

United Kingdom, Spain, Italy, Belgium, the Netherlands and Turkey. The majority of participants were from Turkey. All participants answered the survey voluntarily. The majority of the participants (51.6%) were between 18-24 age-old. 58% of the participants were women. At the education level, the majority of the participants (%65.29) had a bachelor degree. 50% of the participants were a student. The majority of the participants (76.8%) were not satisfied with their income level. Approximately a quarter of the participants can keep their current living standards for less than a month if they suddenly lose their income source. Approximately half of the participants consider their financial situation average compare to people in their country.

4. Results

We used the SPSS program to analyse our survey results and converted all our results in monetary units into a percentage to facilitate the comparison. We used the independent sample t-test to determine if the framing effect impacts the mean of results. In some cases, we remove the outliers from our data. According to (Tabachnick & Fidell, 2013), skewness-kurtosis values should be between +1.5 and -1.5 for normality. Therefore, we remove the outlier to run the independent sample t-test.

As our first hypothesis, we suggest that "*H1: Participants will be more supportive for tax progressivity when the tax payment is framed in percentage unit rather than in monetary unit.*" As we observed in Reimers (2009), framing a tax amount in a percentage unit positively impacts tax progressivity. We expected to observe the same phenomenon in our experiment.

In tax paid (percentage unit) and tax paid (monetary unit) frame multiple questions for Adam & Barbara; the means were 38.41% and 34.28% respectively. (Appendix 1A, 1B) The result of the independent sample t-test is t(123)=-2.4,p= .018.(Appendix 2) Thus, we cannot observe any significant difference between types of frames and the tax progressivity level of the participants in our survey. In slider questions in the percentage unit and monetary unit frame for Adam & Barbara, the means were 36.08% and 32%, respectively. (Appendix 3) The result of independent sample t-test is t(68)= -1.2, p=.225. We cannot observe any significant difference between the impact of percentage frame and monetary unit frame in slider questions.

The means of tax paid (percentage unit) and tax paid (monetary unit) frame multiple questions for Carter & Diana; were 62.63% and 66.28% respectively. (Appendix 4A, 4B) The result of independent sample t-test is t(123)=2.14,p= .034.(Appendix 5) We can observe a significant difference in the mean of different frames. However, we can observe that participants tend to support tax progressivity in the monetary unit frame rather than in the percentage frame. This result is opposite of the findings in Reimers (2009). In slider questions in percentage unit and monetary unit frame for Carter & Diana, the means were 51.13% and 52.37%, respectively. (Appendix 6) The result of independent sample t-test is t(63)= .247 , p=.806.(Appendix 7) We cannot observe any significant difference between the mean and impact of percentage frame or monetary unit frame in slider questions. As we can see from the results of question 1, our results were significantly different from Reimers (2009)

In the second hypothesis, we suggest that "*H2: Participants will be more willing to support tax progressivity when they determine the retained income after tax in the monetary unit than the tax paid in the monetary unit*". In retained income (monetary unit) and tax paid (monetary unit) frame multiple questions for Adam & Barbara; the means were 37.97% and 34.20%, respectively. (Appendix 8) The independent sample t-test is t(112.169)= 1.454, p=. 149. (Appendix 9). Thus, we cannot observe any significant difference In slider questions, the mean of retained income (monetary unit) and tax paid (monetary unit) framed questions are respectively; 39.01% and 32%. (Appendix 10) The independent sample t-test is t(43.870)= 1.444, p=.156. (Appendix 11) Thus, we cannot observe any significant difference.

For Carter & Diana, the means for retained income (monetary unit) and tax paid (monetary unit) frame multiple questions were respectively 62.64% and 65.75% (Appendix 12). The independent sample t-test is t(110.271)= -1.139, p=.257. (Appendix 13) Thus, we cannot observe any significant difference. For slider questions in retained income (monetary unit) and tax paid (monetary unit) frames, the mean values are respectively 63.63% and 52.37% (Appendix 14). The independent sample t-test is t(62)= 2.066, p=.043. (Appendix 15) As we can see from the result, our hypothesis is valid in the slider question for Carter & Diana. The participants supported a higher tax level for Carter & Diana (a high-level income couple) when determining the retained income after tax. Thus, in this case, we can consider that participants supported more tax progressivity when they determined the retained income after taxation (monetary unit) rather than the tax paid (monetary unit). As a result, for question 2, we received different results from Reimers (2009), and participants were more tax progressive when they were asked to determine the tax paid amount (monetary unit).

As hypothesis 3, we suggested that "*H3: Participants will be more tax progressive when they determine the tax paid (percentage unit) than retained income (percentage unit)*" In retained income (percentage unit) and tax paid (percentage unit) frame multiple questions for Adam & Barbara; the means were respectively 40.08% and 38.41%[1]. (Appendix 16) The result of the independent sample t-test is t(64.213)= -.526 , p=.601.(Appendix 17) In slider questions in tax paid (percentage unit) and retained income (percentage unit) frames for Adam & Barbara, the means are respectively 36.08% and 40.88%. (Appendix 18) The independent sample t-test is t(33.09)= -.836 , p=.409. (Appendix 19) As we can see from the results, we cannot observe a significant difference, thus our hypothesis H3 is not valid for Adam & Barbara.

In retained income (percentage unit) and tax paid (percentage unit) frame multiple questions for Carter & Diana; the means were respectively 59.93% and 61.59%[2]. (Appendix 20A, 20B). The result of independent sample t-test is t(64.107)= -.528 , p=.599.(Appendix 21) For slider questions in retained income (percentage unit) and tax paid (percentage unit) frame, the means are respectively 53.42% and 51.13%.(Appendix 22) The result of independent sample t-test is t(53)= -.387 , p=.700.(Appendix 23) As we can see from the results, we cannot observe a significant difference for Carter & Diana. Thus, we can conclude that our hypothesis is not valid for Carter & Diana.

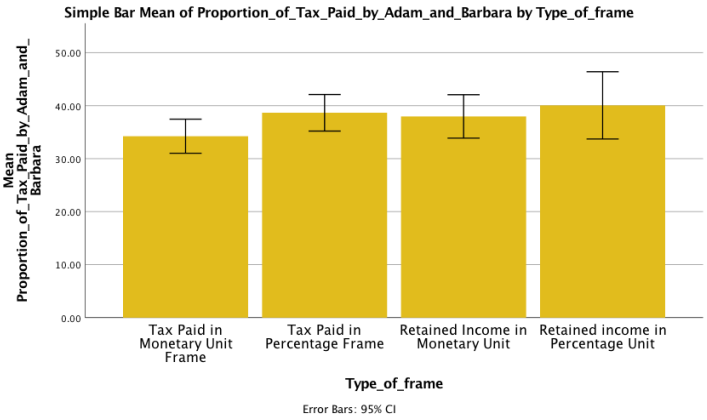
As hypothesis 4, we suggest that "*H4: Participants will be indifferent in terms of progressivity when they determine retained income (monetary unit) or retained income (percentage unit)."* In retained income (monetary unit) and retained income (percentage unit) frame multiple questions for Adam & Barbara; the means were respectively 37.97% and

[1] the outliers were excluded from data set

[2] the outliers were excluded from data set

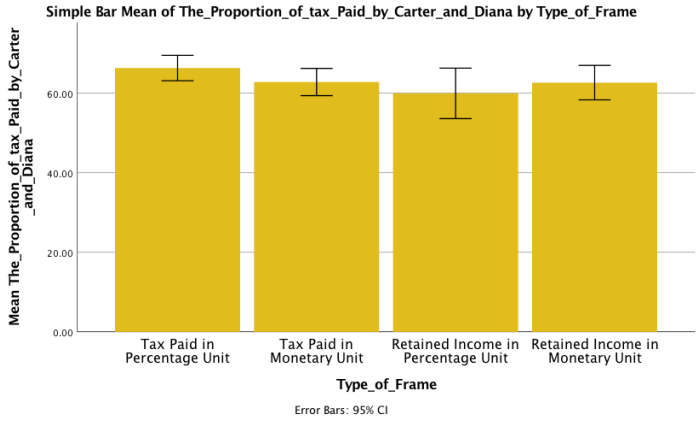
40.07%. (Appendix 24) The result of independent sample t-test is t(90.2)= -.556 , p=.580.(Appendix 25) In slider questions in retained income (monetary unit) and retained income (percentage unit) frames for Adam & Barbara, the means are respectively 39.01% and 40.88%. (Appendix 26) The independent sample t-test is t(51)= -2.79 , p=.784. (Appendix 27) From the independent sample t-test for both multiple choice and slider questions, we did not get statistically significant results. Thus, we can conclude that hypothesis 4 is valid for Adam & Barbara.

Figure 9: The Proportion of Tax Paid by Adam & Barbara



In retained income (monetary unit) and retained income (percentage unit) frame multiple questions for Carter & Diana; the means were respectively 62.64% and 59.93%. (Appendix 28) The result of independent sample t-test is t(93.472)= .705 , p=.482 (Appendix 29) In slider questions in retained income (monetary unit) and retained income (percentage unit) frames for Carter & Diana, the means are respectively 63.63% and 53.42%. (Appendix 30) The independent sample t-test is t(52)= 1.582 , p=.120. (Appendix 31) From the independent sample t-test for both multiple choice and slider questions, we did not get statistically significant results. Thus, we can conclude that hypothesis 4 is valid for Carter & Diana. Thus, we can conclude that participants were indifferent when they determine retained income (monetary unit) or retained income (percentage unit). Thus, we can consider that H4 is valid for both couples.

Figure 10: The Proportion of Tax Paid by Carter & Diana



When we compare the different means of four frames for the proportion of tax paid by Adam & Barbara, we can see that participants determined a higher proportion of tax payment when the “retained income(monetary unit)” frame is used (Figure 9). Also, the participants determined a lower proportion of tax payment when the “tax paid(monetary unit” frame is used. (Figure 9) When we compare the different means of four frames for the proportion of tax paid by Carter & Diana, we can see that participants determined a lower proportion of tax payment when the “retained income(monetary unit)” frame is used (Figure 10). Also, the participants determined a higher proportion of tax payment when the “tax paid(monetary unit)” frame is used. (Figure 10)

As we can understand from (Figure 9) and (Figure 10), when we consider the different means of four frames for the proportion of tax paid by Adam & Barbara and Carter & Diana, participants tend to be more willing to support tax progressivity in "tax paid(monetary unit)" frame and less support tax progressivity for "retained income(monetary unit)"

As hypothesis 5, we suggested, "*H5: Participants' willingness to support for tax progressivity will not change significantly due to type of a good (hedonic vs utilitarian*)" In our experiment, we considered a "traffic lamp" as a utilitarian good and a "tennis court" as an hedonic good. When we asked participants to determine the contribution amount of Adam & Barbara in percentage unit frame, the mean of answers was 47.15% for the traffic lamp and 44.99% for the tennis court(Appendix 32A, 32B). Participants determined the contribution of Carter & Diana for the traffic lamp and tennis court; the means of answers were respectively 53.30% and 55.14% (Appendix 33A, 33B). For both Adam & Barbara and Carter & Diana, we ran the independent sample t-test, but we did not receive a significant difference. (Appendix 34, 35)

When we asked participants to determine the contribution amount of Adam & Barbara in the monetary unit frame, the mean of answers was 43.74% for traffic lamp and 48.75% for the tennis court (Appendix 36A, 36B). The result of independent sample t-test is t(230.761)= -2.680, p=.008. From the results, we can conclude that when participants determined the contribution amount of Adam & Barbara in the monetary unit frame, the type of good has a significant impact on the tax progressivity level of participants.

Participants determined the contribution of Carter & Diana for traffic lamp and tennis court (in monetary unit frame); the means of answers were respectively 55.45% and 51.26% (Appendix 38A, 38B). The independent sample t-test is t(237.426)= 2.382, p=.018. (Appendix 39) From the results, we can conclude that when participants determined the contribution amount of Carter & Diana in the monetary unit frame, the type of good has a significant impact on the tax progressivity level of participants. However, the participants were more tax progressive when they determined a tax amount for a tennis court (hedonic good) rather than a traffic lamp (utilitarian good)

As hypothesis 6, we suggest, "*H6: Participants' perception of fair taxation will change if one of the couples (Adam & Barbara or Carter & Diana) benefits more from a good*." Participants are asked to determine the contribution amount for a tennis court for both Adam & Barbara or Carter & Diana. We provide two different situations; in the first situation, Adam & Barbara benefit more from the tennis court, while in the second situation, Carter & Diana benefit more.

For Adam & Barbara (monetary unit), the mean contribution amount determined for tennis court in the first situation (Adam & Barbara benefit more) was 48.34%, while in the second situation (Carter & Diana) was 36.22. (Appendix 40) The independent sample t-test is t(252)= 4.411, p=<.001. (Appendix 41) For Carter & Diana (monetary unit), the mean contribution amount determined for the tennis court in the first situation (Adam & Barbara benefit more) was 51.65, while in the second situation (Carter & Diana) was 63.77. (Appendix 42). The result of independent sample t-test is t(252)= -4.411, p=<.001. (Appendix 43). As we can see from the result, we found a strong difference between the benefit level of a couple and the assigned tax burden. We can see similar results in the percentage frame too. For Adam & Barbara (percentage unit), the mean contribution amount determined for tennis court in the first situation (Adam & Barbara benefit more) was 49.53%, while in the second situation (Carter & Diana) it was 36.25. (Appendix 44). The result of the independent

sample t-test is t(242)= 4.674, p=<.001. (Appendix 45). For Carter & Diana (percentage unit), the mean contribution amount determined for the tennis court in the first situation (Adam & Barbara benefit more) was 50.79, while in the second situation (Carter & Diana) was 63.74. (Appendix 46) The result of independent sample t-test is t(242)= -4.499, p=<. 001. (Appendix 47) As we can see from the results, we found a strong difference between the benefit level of a couple and the assigned tax burden. From these results, we can conclude that the benefit level of a couple (Adam & Barbara and Carter & Diana) has a significant impact on the perception of tax fairness of participants.

As hypothesis 7, we suggest, "*H7:Perception of tax fairness will change if a purchase (a good or service) has negative external impacts*." To analyse this hypothesis, we used the data from question 3 and question 7. In question 3, we asked our participants to determine the contribution amount of a traffic lamp for both couples (Adam & Barbara and Carter & Diana). We used the data from question 3 because both couples benefit equally from the traffic lamp, and there are no negative externalities for society. We compared the answers for the contribution of a traffic lamp and the car fee for Adam & Barbara and Carter & Diana.

For Adam & Barbara, the mean car fee (monetary unit) determined is 49.28%. and for the traffic lamp (monetary unit) is 43.56%. (Appendix 50) The result of the independent sample t-test is t(249)= -2.591, p=.010 (Appendix 51). For Carter & Diana, the mean amount of car fee (monetary unit) determined is 54%. and for the traffic lamp (monetary unit) is 55.71%. (Appendix 52) The result of the independent sample t-test is t(249)=.799, p=.425. For Adam & Barbara (percentage unit) (Appendix 53), the mean amount of car fee (percentage unit) determined is 49.91%. and for the traffic lamp (percentage unit) is 47.15%. (Appendix 54A, 54B) The result of independent sample t-test is t(212.792)= -1.754, p=.081 (Appendix 55) For Carter & Diana, the mean amount of car fee (percentage unit) determined is 50.08%. and for the traffic lamp (percentage unit) is 53.30%. (Appendix 56A, 56B) The result of independent sample t-test is t(232)=2.020, p=.045. (Appendix 57) As we can see from the results, we found a statistically significant difference in Adam & Barbara (monetary unit) and Carter & Diana (percentage unit) for the relationship between perception of tax fairness and negative external impact of a purchase. For the other results, we cannot find a statistically significant difference, but it is clear that participants' perception of tax fairness changed for Adam & Barbara, when the couple chose to purchase a car that had negative consequences on society.

As for hypothesis 8, we suggest that "*H8: Participants will be more supportive for tax progressivity when the tax refund is framed in percentage unit rather than in monetary unit.*" We were inspired by Reimers (2009) for this hypothesis. As we can see from the Reimers (2009) study, framing a tax amount in a percentage unit has a positive impact on the tendency for tax progressivity. In our experiment, we tested if framing a tax refund in a percentage unit will have the same impact on the tax progressivity.

In tax refund (percentage unit) and tax refund (monetary refund) frame multiple questions for Adam & Barbara; the means were respectively 48.35% and 45.87%. (Appendix 59) The result of independent sample t-test is t(135)=-.924 ,p= .357.(Appendix 60) Thus, we cannot observe any significant difference between types of frames and the tax progressivity level of the participants. In slider questions in percentage unit and monetary unit frame for Adam&Barbara, the means were respectively 51.64% and 36%. (Appendix 61) The result of the independent sample t-test is t(67)= -3.876, p=<.001. As we can see from the result, there is a statistically significant difference between framed used and tax

progressivity level. We can conclude that when a tax refund is framed in percentage units, participants choose a more progressive tax refund schedule.

In tax refund(percentage unit) frame and tax refund (monetary unit) frame multiple questions for Carter & Diana; the means were respectively 51.64% and 54.12%. (Appendix 63) The result of the independent sample t-test is t(135)=.923,p=.357. (Appendix 64) We can observe a relatively large change in the means of tax refund received by Carter&Diana due to changing frames. However, when we run the independent sample t-test, we cannot get a significant result. In slider questions in the percentage unit and monetary unit frames for Carter & Diana, the means were respectively 51.35% and 49.81%. (Appendix 65) The result of an independent sample t-test is t(62)= -.309, p=.759.(Appendix 66) We cannot observe any significant difference between the mean of assigned tax refund and percentage unit frame or monetary unit frame in slider questions.

As hypothesis 9, we suggest that "*H9: Participants will be more willing to support tax progressivity when they are asked to determine the final income after-tax refund in a monetary unit, rather than determine the tax refund in the monetary unit.*"

In final income after-tax refund (monetary unit) and tax refund (monetary unit), multiple choice questions for Adam & Barbara; the means were respectively 48.85% and 45.87%. (Appendix 67) The result of the independent sample t-test is t(124)= -.921, p=.359. (Appendix 68). Thus, we cannot observe any statistically significant difference. In slider questions, the mean of final income after-tax refund (monetary unit) and tax refund (monetary unit) questions are, respectively, 46.76% and 36%. (Appendix 69) The result of independent sample t-test is t(59)= -2.204 , p=.031. (Appendix 70) Thus, we can observe a statistically significant difference. The participants supported a higher level of tax refund for Adam & Barbara when they were asked to determine the final income after-tax refund (monetary unit).

For Carter & Diana, the means for final income after-tax refund and tax refund (monetary unit) multiple questions were respectively 51.15% and 54.12% (Appendix 71). The result of the independent sample t-test is t(124)= .921, p=.359. (Appendix 72) Thus, we cannot observe any statistically significant difference. For slider questions in final income after-tax refund (monetary unit) and tax refund (monetary unit) frames, the mean values are respectively 41.75% and 49.81% (Appendix 73). The result of the independent sample t-test is t(60)= 1.441, p=.155. (Appendix 74) As a result of the t-test, we cannot observe a statistical significance. However, when we only consider the mean values; we can see that participants tend to attribute more tax refund to Adam & Barbara and less amount of tax refund to Carter & Diana when they determine the final income after-tax refund (monetary unit)

As hypothesis 10, we suggest that *"H10: Participants will be willing to support tax progressively more when determining the tax refund amount (percentage unit) rather than determining the final income after-tax refund (percentage unit)."*

In final income after-tax refund (percentage unit) and tax refund (percentage unit), multiple questions for Adam & Barbara; the means were respectively 43.72% and 48.35%. (Appendix 75) The independent sample t-test is t(84.650)= 1.368, p=.175. (Appendix 76). Thus, we cannot observe any statistically significant difference. In slider questions, the mean of final income after-tax refund (percentage unit) and tax refund (percentage unit) questions are respectively; 42.86% and 51.64%. (Appendix 77) The independent sample t-test is t(60)= 1.819, p=.074. (Appendix 78) Thus, we cannot observe statistically significant difference. As we can see from the results, hypothesis 10 is not valid for Adam & Barbara.

In final income after-tax refund (percentage unit) and tax refund (percentage unit) multiple questions for Carter & Diana; the means were respectively 56.37% and 51.64%. (Appendix 79) The result of the independent sample t-test is t(84.498)=-1.394, p=.083. (Appendix 80). Thus, we cannot observe any statistically significant difference. In slider questions, the mean of final income after-tax refund (percentage unit) and tax refund (percentage unit) questions are respectively; 53.33% and 51.35%. (Appendix 81) The result of independent sample t-test is t(54)= -.438 , p=.663. (Appendix 82) Thus, we cannot observe statistically significant difference. As we can see from the results, hypothesis 10 is not valid for Carter & Diana.

As hypothesis 11, we suggest that "*H11: Participants will be indifferent in terms of progressivity when they determine the final income after-tax refund (monetary unit) or final income after-tax refund (percentage unit).*"

In final income after-tax refund (monetary unit) and final income after-tax refund (percentage unit), multiple questions for Adam & Barbara; the means were respectively 48.85% and 43.72%. (Appendix 83) The independent sample t-test is t(107)= 1.333, p=.185. (Appendix 84). Thus, we cannot observe any statistically significant difference. In slider questions, the mean of final income after-tax refund (monetary unit) and final income after-tax refund (percentage unit) multiple questions for Adam & Barbara are respectively; 42.86% and 46.76%. (Appendix 85) The result of independent sample t-test is t(52)= -.672 , p=.504. (Appendix 86) Thus, we can not observe statistically significant difference. As we can see from the results, hypothesis 11 is valid for Adam & Barbara.

In final income after-tax refund (monetary unit) and final income after-tax refund (percentage unit) multiple questions for Carter & Diana; the means were respectively 51.15% and 56.37%. (Appendix 87) The independent sample t-test is t(107)=-1.357, p=.178. (Appendix 88). Thus, we cannot observe any statistically significant difference. In slider questions, the mean of final income after-tax refund (monetary unit) and final income after-tax refund (percentage unit) questions are respectively; 41.75% and 53.33%. (Appendix 89) The result of independent sample t-test is t(52)= 2.198 , p=.032. (Appendix 90) Thus, we can observe statistically significant difference. As we can see from the results, hypothesis 11 is valid for Carter & Diana.

As hypothesis 12, we suggest that "*H12: Participants' fairness of tax perception will change if one of the couples (Adam & Barbara and Carter & Diana) need more assistance for a situation*." In this situation, Carter & Diana need more financial help than Adam&Barbara, even though they have a higher level of income. We asked participants to determine the tax exemption for a newborn baby. The mean of tax exemption for Adam & Barbara and Carter & Diana (monetary unit) was 50.23% and 49.76%, respectively (Appendix 91). For the mean of tax exemption for Adam & Barbara and Carter & Diana (percentage unit), 51.54% and 48.45%, respectively. As we can see from the results, even though Carter & Diana needs more financial help for their newborn baby, the participants determined more newborn baby related tax exemption to Adam & Barbara. From this result we can conclude that the income level of the couples has a dominant effect on the participants' fairness of tax perception.

As the last question, we asked our participants if they considered their answers fair after receiving the extra background information about Adam & Barbara and Carter & Diana. To analyse our last question, we also used the participants' personal information. As we can see from the results, %58 of people considered their answers unfair, 22.09% considered fair, and 19.28% of them were indifferent. When we analyse our results based on the age of the participants, we can understand that young people are more sensitive to given background

information. Among the participants between 18-24 age, 66.15% considered their answer unfair, 20%of them considered their answer fair, and 13.85% were indifferent. For participants older than 18-24 age, 50.42% of them consider their answer unfair, 24.36% of them consider their answer fair, and 25.22% of them were indifferent. As we can see from the results, all participants were sensitive to given extra background information for Adam & Barbara and Carter & Diana. However, the sensitivity level is higher in the young population.

Also, we analysed the relationship between participants' satisfaction from their income level and the satisfaction from their answers after receiving the extra background information. Among the participants who were not satisfied with their income level, %64.58 of them considered their answers unfair, 17.18% considered fair, and 18.24% of them were indifferent. Among the satisfied or neutral participants with their income level, 38.60% of them considered their answers unfair, 26.31% of them considered fair, and 35.09% of them were indifferent. As we can see from the results, participants who are satisfied or neutral with their income level are less sensitive than participants who are not satisfied with their answers for the extra given background information for Adam & Barbara and Carter & Diana.

In addition to them, we analysed the education level of participants and participants' satisfaction with their answers after receiving the extra background information. We decided to the compare lowest (primary, middle and high school) and highest (Master and PhD) education levels. Among the participants who have (primary, middle and high school) level education, %58.82 of them considered their answers unfair, 29.41% considered fair, and 11.77% of them were indifferent. Among the participants who have (Master and PhD) level education, %50.94 of them considered their answers unfair, 33.97% considered fair, and 15.09% of them were indifferent. As we can see from the results, participants with higher education levels are relatively less sensitive to the extra background information for Adam & Barbara and Carter & Diana.

5. Discussion

We observed a dramatic impact of the framing effect in some cases, while we could not observe significant results in some cases. In the first four hypotheses (H1, H2, H3, H4), we replicated the Reimers (2009) experiment. However, we received different results from Reimers (2009) in our experiment. In hypothesis 1 (H1) the percentage frame did not increase the tax progressivity level of participants. Contrarily, participants were more tax progressive in tax paid amount (monetary unit).

In hypothesis 2 (H2), we expected participants to be more tax progressive when they were asked to determine the retained income after tax (monetary unit). However, also here we received the opposite result in our experiment, and participants were more tax progressive when they were asked to determine the tax paid amount (monetary unit)

In hypothesis 3 (H3), participants were more tax progressive when they determined the retained income after tax (percentage unit) compared to tax paid (percentage unit). However, in Reimers (2009), we observe the opposite results.

In hypothesis 4 (H4), we expected that participants would be indifferent in terms of tax progressivity when they determine the retained income (monetary unit) or retained income (percentage unit). The results from our experiments supported hypothesis 4 (H4).

As we can see from the results of the first four hypotheses, results were not totally similar to Reimers (2009). The different types of questions and different numerical values

used can explain this inconsistency. Also, in Reimers (2009), participants were from the UK, while in our experiment, participants were from various countries (mainly from Turkey). Different locations that the experiment takes part in also may impact the results. As we see in Edlund (2003) and Blaufus et al. (2013), different nationalities may affect the perception of fair taxation.

In hypothesis 5, we could not see significant results that participants' willingness to support tax progressivity changes due to type of good (hedonic vs utilitarian). The results were similar to (Bergan & Risner 2016). Participants were not more supportive for tax progressivity when they determine the contribution amount for a utilitarian good. (except slider question monetary unit frame Adam & Barbara) Therefore, we cannot suggest that the type of good has always a significant impact on the preference for tax progressivity of participants.

In hypothesis 6, we observed that the participants' perception of fair taxation changed when one of the couples (Adam & Barbara or Carter & Diana) benefits more from a good. The result from hypothesis 6 was the most statistically significant one. We can clearly understand that framing questions with different benefit levels dramatically impacts participants' perception of fair taxation.

In hypothesis 7, we observed that participants' perception of tax fairness changed with potential negative impacts of purchase (a good or service). Even though the income level of a couple still dominates the participants' perception of tax fairness, participants are more minor tax progressive when society is impacted negatively. Therefore, we can conclude that participants prioritise society's benefit and welfare.

In Reimers (2009) the focus was on tax payment. We used similar frames for hypotheses 8, 9, 10 and 11, but focused on the tax refund. However, as we can see from the results, we cannot see precisely similar results as Reimers (2009). H8, H9 and H10 were not valid for both couples (Adam & Barbara and Carter & Diana).

In Reimers (2009) frames were used for tax payment amounts. Therefore we can observe that using the same kind of frames for tax refund do not give same results. Also, as we have explained before for hypotheses (H1, H2, H3, H4), different locations, types of questions, and numerical values can be the reason for this inconsistency.

In hypothesis 12, participants determined the tax exemption for a newborn baby. In this situation, Carter & Diana need more financial help than Adam & Barbara. When we compare the mean of determined tax exemption for newborn baby, we can clearly see that participants are still more supportive for Adam & Barbara. From the results, we can see that the income level of the couples (Adam & Barbara and Carter & Diana) is a more decisive factor on the perception of fair taxation than the situation of need assistance.

For the last question, we asked participants if they found their answer fair after receiving the extra background information about Adam & Barbara and Carter & Diana. We used the personal information of participants to interpret the results. When the participants are younger, we observed that they are more sensitive to background information about the couples (Adam & Barbara and Carter & Diana). In addition to them, when participants are more satisfied or neutral with their income level, they are less sensitive to background information about the couples (Adam & Barbara and Carter & Diana). From an educational perspective, when participants have a higher level of education, they are less sensitive to information about the couples. Therefore, as we can see in Edlund(2013), the education level of participants can impact the perception of fair taxation. Participants with higher education level consider their answers more fair than the participants with lower education level.

6. Conclusion

Opposite to neoclassical economics, people do not always decide based on rational reasoning. In many cases, people's decisions are affected by external factors. In this context, framing effects are a well-documented cognitive bias that alter an individual's decision mechanism. In this study, we focused on the experimental analysis of framing effects and their impact on the perception of fair taxation. We designed an experiment based on previous studies in the literature. In our experiment, 250 participants received different scenarios and eleven questions about two couples.

In some cases, we found results of the framing effects on the perception of fair taxation that were sometimes different from those obtained earlier in the literature. In our experiment we were inspired by many contributions and created our hypothesis. For the survey questions that were based on Reimers (2009), we received different results in our experiment. However, our group of participants, numerical values and style of the questions were different from Reimers(2009). Thus, we can explain this gap in results with differences of survey questions and different participant group.

In our experiment, the most statistically significant result was in hypothesis 6. The benefit level of a couple (Adam & Barbara or Carter & Diana) from a good was an essential deciding factor in the perception of fair taxation. In another hypothesis, we could observe that the income level of couples (Adam & Barbara and Carter & Diana) was a significant factor in the perception of fair taxation.

In addition to them, we revealed that different personal background of participants can affect the perception of fair taxation. Education level, age and satisfaction with income level are important factor can alter an individual's perception of fair taxation.

In this study, we had a broader focus than any other study in the literature, and this feature of our study distinguishes our experiment from previous studies. We analysed our data under 12 hypotheses and have a more detailed analysis. We used similar questions from previous literature in some parts of our experiment. As our contribution, we designed new questions based on previous studies. Our participant group consisted of 250 individuals. This number of participants was below the average number of participants in Reimers (2009), Bergan &Risner (2016), Heyndels & Kuehnhanss (2018), Edlund (2003), Blaufus et al.(2013), and above the average number of participants in Baron & McCaffery (2004) and Roberts et al. (1994). In a further study, more participants can be used to receive more data for having more significant results. In addition to that, our participants were heterogeneous in terms of nationality. If we could have the opportunity to focus on two different nationalities separately, we could observe how national differences can impact the perception of fair taxation.

To sum up, the framing effect is an important factor for analysing fair taxation perception. Our experiment observed that some framing effects significantly changed the participants' perception of fair taxation, while some did not give the expected results. We can explain this inconsistency with differences between our experiment and the previous studies. However, it is clear that if we want to achieve a complete understanding of changing perspectives of people for fair taxation, we need to broadly understand the impact of framing effects.

7. References

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