

# ULUSLARARASI SOSYAL ARAŐTIRMALAR DERGİSİ THE JOURNAL OF INTERNATIONAL SOCIAL RESEARCH

Uluslararası Sosyal Arařtırmalar Dergisi / The Journal of International Social Research  
Cilt: 13 Sayı: 72 Ağustos 2020 & Volume: 13 Issue: 72 August 2020  
www.sosyalarastirmalar.com Issn: 1307-9581

## PUBLIC POLICY IMPLICATIONS OF COGNITIVE BIASES AND HEURISTICS

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### Abstract

In the last decade, public policies witnessed a couple of innovations due to considerable evolvments in economic theory. The rationality that is one of the essential principles of economic theory was questioned due to some empirical violation examples. Hence, behavioral economics that uses psychological insights to understand human behaviors has risen as a new branch of economics. According to the findings of behavioral economics, some cognitive biases and heuristics may lead individuals to act irrationally. Therefore, considering the most fundamental actor in policymaking is humans, it is suggested that the policies should be designed based on this fact. Hence, the goal of this project is to analyze the efficiency of behavioral economics into public policymaking. It will be discussed whether behavioral economics' findings, more specifically, cognitive biases and heuristics can bring better outcomes than the traditional way of policymaking in some specific areas. For this purpose, several application examples of cognitive biases and heuristics will be presented in the second section of this study. Nevertheless, only status quo bias, framing effect, and mental accounting were selected for this study due to application features in building and implementing public policies.

**Keywords:** Behavioral Economics, Cognitive Biases and Heuristics, Behavioral Public Policy, Nudge.

### INTRODUCTION

The main goal of public policy is to provide an efficient market structure for individuals and firms. Therefore, when there is a market failure such as public goods, externalities, information asymmetries, policymakers should eliminate it. Policymakers can eliminate these failures in several ways. For instance, the policymakers can shift the market prices to the equilibrium point (the point where the demand and supply curves intersect) by taxing or subsidizing, or they can arrange the output level of goods produced in the market environment. Recent research done by behavioral economists

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demonstrates that there is another cause of market efficiency that occurs due to a lack of individuals' cognitive abilities. Therefore, it is suggested that this inefficiency also should be fixed by the governments (Madrian, 2014, 3). Nevertheless, even in the case of perfect market structure, governments' intervention design based on cognitive biases and heuristics might be efficient since these interventions might make some individuals better off while making no one worse off (Fang and Silverman, 2005, 2).

When forming public policies, policymakers should consider humans' low level of cognitive abilities, since they are the essential target group of policymaking. If there is a new understanding of economic theory, policymakers should update the policymaking process by involving this new understanding of economic theory. However, the behavioral way of policymaking does not deny the traditional ways wholesale. It rather assumes that there might be some specific areas in the society that governments should approach more sensitively and design more specific policies based on the issue. This topic is vital since behavioral methods might be needed in some specific areas. For instance, people might want to save more, eat healthier, go to the gym more, smoke less, consume less energy. However, they may not be successful due to their lack of cognitive ability and willpower or the complexity of the duty (Madrian, 2014, 11).

It is assumed that governments should help the citizens to make better choices in their lives since the decision-making process might be difficult for them. Moreover, the consequences of an individual's irrational behaviors might not concern only this individual sometimes. For instance, if people do not eat healthily, in the long run, there will be many obese people that governments will need to take care of by spending much money to public hospitals. Therefore, the topic is crucial and needs to be analyzed since it might concern the welfare of society. Hence, behavioral economists conduct many randomized controlled trials (RCTs) to test the efficiency of behavioral methods into public policies and suggest several policy recommendations.

Shortly, the main target of behavioral public policies is designing less costly and more efficient policies where traditional methods are not helpful. Behavioral economics plays a crucial role here: it can help to change some irrational behaviors of individuals. Moreover, applying behavioral economics to increase policy design's efficiency is needed where traditional methods are not efficient (Chetty, 2015, 1-29). Behavioral economics analyzes some cognitive biases and heuristics in individuals' behaviors with the help of experimental methods. The author assumes that designing public policies by considering these irrationalities (cognitive biases and heuristics) can bring successful outcomes since humans are the most basic group of policymaking.

The main aim of this research is to analyze the efficiency of behavioral economics into public policies. It is assumed that behavioral economics, more specifically cognitive biases, and heuristics can provide better outcomes than traditional public policies in some specific areas. Because behavioral economics involves the irrational parts (mainly cognitive biases and heuristics) of humans to the process of public policymaking and it can play an important role in the designs of public policies as it will be discussed with several empirical shreds of evidence in this study. After presenting the literature review, some application areas of behavioral public policies created by the help of cognitive biases and heuristics will be presented from several studies.

### **Literature Review**

Many countries are using behavioral public policies after the rise of behavioral economics. The U.K. is considered as a leader in this area since the first Behavioral Insight Team (BIT) was founded by the U.K. cabinet in 2010. Many other countries followed the model of the U.K. and created BITs in their cabinets. At least 202 public institutions apply behavioral insights to their public policies by the year 2018 (Halpern and Sanders, 2012, 62). Hence, there are more than 202 BITs in the whole world nowadays.

David Halpern, the Director of the U.K. Behavioral Insights Team, summarizes the importance of this topic with his words as follows: "A lot of our policy models traditionally are based on a rather naive understanding of what drives behavior. But if you have a more intelligent, nuanced account of how people make decisions, you can design a policy that is more effective, less costly, and makes life



easier for most citizens." (Bell, 2013 as cited in Madrian, 2014, 3). Hence, it is crucial to understand the decision-making process of individuals to create more effective public policies.

The main popularity of behavioral public policies occurred after Richard Thaler was awarded to Nobel Prize in 2017 in the branch of economics thanks to his contribution to the "Nudge" theory. According to the nudge theory, it is possible to produce less costly and more efficient policies by nudging people to good and healthy decisions. As a word, nudge is a symbolic word that attempts to describe the fact that it is possible to make significant changes in human behaviors with small touches. This theory states that individuals might need to be nudged in some areas due to their lack of cognitive abilities. Hence, governments should nudge citizens to make them make better and healthier decisions. These nudges sometimes only consist of simplifying the decision-making process if it is too complicated for individuals (Thaler and Sunstein, 2009, 1-253).

Richard Thaler and Cass Sunstein (2013, 428-439) analyze a term called "Libertarian Paternalism", which states that it is possible to nudge individuals to the right choices. According to their idea, this nudge does not have to consist of intervening individuals' freedom of choice. The nudges can be designed in a way that they do not prevent individuals from choosing bad options. However, in such designs, good options might look like more available to be chosen. Yet, bad options are still reachable, and there is no prevention of these options. Therefore, an individual's choices are already narrowed and manipulated by the structure of the market design.

Moreover, the main target of nudge is not narrowing the choices; instead, it focuses on changing the environmental factors that lead individuals to make irrational choices. For instance, putting healthy foods in more salient locations might encourage individuals to consume healthier foods. In this way, they can still choose unhealthy foods, and there is no intervention for citizens' freedom of choice. However, the probability of buying healthy foods might increase since healthy foods become more salient than others. This is a good example of directing individuals' limited attention to beneficial tools (Thaler and Sunstein, 2003, 175-176). Sellers are also using this technique to increase the sale of expensive products. Therefore, humans are already occupied by "bad nudges". Hence, nudging individuals is a useful tool to increase individuals' quality of life and decrease their cost of living. Moreover, nudging is required since individuals' low cognitive abilities prevent them from making the right decisions and choices in their lives. Thus, nudges should be designed based on these cognitive biases and heuristics (Hansen, 2016, 7-9).

To consider an intervene as a nudge, it should consist of three crucial elements as follows:

- It should not be imposed
- It should be as simple as possible
- Avoiding from the intervene should consist of low costs (Thaler and Sunstein, 2013, 17).

Shortly, "a policy counts as paternalistic if it is selected to influence the choices of affected parties in a way that will make those parties better off". However, while helping individuals, policymakers must respect individuals' freedom of choices (Thaler, Sunstein, 2003, 176).

To show the importance of the nudge theory, the author would like to illustrate the following examples:

In one study, it was empirically shown that people tend to be influenced by their neighbors' social norms and spending behaviors. Allcott (2011, 1082-1095) empirically demonstrates that sending a report to householders about their neighbor's energy consumption significantly decreases the level of energy consumptions on average. As another example of the importance of social norms, according to the findings of Gerber and Rogers (2009, 178-191), participation rates in the elections increase when individuals are informed that participation rates will be high. It probably evokes a "social responsibility" feeling on the citizens when they get a piece of information about high participation levels. Considering participation rates to elections decrease day by day, behavioral methods can be used to increase the participation rates in the elections.

The USA is another country that uses intense behavioral methods in their policies. For instance, Barrack Obama strongly recommended using behavioral economics in public policies just before his presidency ended. He signed for a regulation on 15 September 2015 that is called "Using Behavioral Science Insights to Better Serve the American People". Then, the Social and Behavioral Sciences Team



(SBST) was established in the same year in the USA (Congdon and Shankar, 2015, 1). Based on their regulatory policies, behavioral sciences are applied to many areas such as credit card regulations, retirement savings plans, health sector, and educational sectors (Lunn, 2014, 26-28).

Turkey also started to use behavioral methods in policymaking, and the Department of Behavioral Public Policies and the Department of New Generation Technologies of the Ministry of Economy in Turkey was established in 2018. The most valuable work of the team is promoting exports through government incentives. The team attempts to increase the awareness of government incentives for exports and thus increase the applications to those incentives (Turkish Ministry of Economics, 2018, 108-123). According to the results, simplifying the application process, a proper way of informing the firms, and the step-by-step guide increased the applications by 27% (BIT, 2018).

Moreover, Bhargava and Loewenstein (2015, 396-401) analyze the importance and applications of behavioral economics in public policies, French and Oreopoulos (2017, 599-635) discuss the applications of behavioral economics to policy design in Canada. Van Bavel et al. (2013, 1-21) discuss how to apply behavioral sciences into E.U. policymaking with the descriptions of several methodologies. Galizzi (2017, 1-16) analyzes the methodology of behavioral insights into public policies.

After presenting the literature review, a theoretical framework of cognitive biases and heuristics will be analyzed in the next section before analyzing their several applications into public policies.

### **Theoretical Framework of Cognitive Biases and Heuristics**

The assumptions of standard economic theory (known as neoclassical economics) have great success regarding their contribution to economic theory. Nevertheless, their assumptions are systematically inconsistent with some real-world observations and controlled experiments (Opaluch and Segerson, 1989, 1). Individuals do not act rationally as standard economic assumptions indicate due to the existence of many types of cognitive biases and heuristics. They usually tend to count in some cognitive biases and heuristics when choosing the best option among alternatives (Tversky and Kahneman, 1974, 1124). A cognitive bias refers to systematic deviations from rationality, while heuristic is known as mental shortcuts to simplify the choice process. Although heuristics might be useful sometimes, they might lead to irrational behaviors too. Hence, cognitive biases and heuristics, and many other factors made some economists question the rationality principle in economic theory. Herbert Simon was the first scholar who started this debate. He updated the rationality principle in economic theory and then called this updated version as "bounded rationality" (Simon, 1955, 161-176). Bounded rationality states that individuals' rationality is limited because of several factors, such as environmental limitations, time constraints, and cognitive limitations of the human brain.

Cognitive biases might occur as a result of shortcuts and fast thinking process. They mostly work as automatic, and it might be difficult to avoid them. Although they might be useful in some cases, they may lead individuals to make inconsistent and biased decisions. There are more than 100 cognitive biases and heuristics (Ehrlinger et al., 2016, 3). Cognitive biases and heuristics, as a term, first introduced by Kahneman and Tversky at the beginning of the 1970s. Their researches about cognitive biases and heuristics were addressed to the individual's decision-making process under limited sources. These researches were inspired by Simon's bounded rationality concept (Wilke and Mata, 2012, 531). Furnham and Boo (2011, 25) assume that this bounded rationality model can be considered as a "model of heuristic cognition", too. For instance, individuals tend to heavily weigh losses compared to similar gains (loss aversion bias), they tend to categorize the money based on their sources (mental accounting), they heavily weigh sunk costs (a cost that is already done) and thus, stick to losing investments (sunk cost fallacy). They tend to be influenced by an unrelated initial number when they make an estimation (anchoring effect). These kinds of cognitive biases and heuristics create another type of market efficiency. Hence, it is assumed that governments should approach this type of market failure sensitively and make the required regulations or interventions.

In the next section of this study, application examples of cognitive biases and heuristics into public policies will be presented from several studies.





## **Application Examples of Cognitive Biases Into Public Policies**

Understanding cognitive biases and heuristics can help policymakers to design effective policies for the public. However, the choice process of cognitive biases and heuristics is narrowed in this study due to application features in building and implementing public policies. Hence, in this section, only status quo bias, framing effect, and mental accounting will be presented with several application examples.

For instance, participation in retirement saving plans can be increased by the help of default options and status quo bias. The default option refers to an option that will be in force unless the opposite would be stated. According to the status quo bias, individuals mostly stick to the initial choice even when there are better options than the current option. As an example of status quo bias, many inefficient tools prevail in their existence because changing is costly. For instance, although there are better keyboards than standard keyboards in terms of efficiency, mostly standard keyboards are preferred due to the existence of transition costs (David, 1985 as cited in Samuelson and Zeckhauser, 1988, 33). As another example, various American institutions like educational and presidential ones owe their existence mostly to historical traditions and difficulty of a wholesale change or examination (Samuelson, Zeckhauser, 1988, 34).

Individuals tend to benefit from ready options given to them due to their high level of inertia. Therefore, if participation in the retirement plans become automatic, this might increase the participation rates among employees. In this kind of retirement system, when the employees become eligible for a retirement plan, the system automatically starts and continues as long as they do not quit. Hence, unlike other plans, the default option is participating in the plan instead of not participating. Employees who do not do anything to cancel the plan automatically will be enrolled in the system at a low saving rate, such as 3%. As supportive evidence of this statement, a retirement plan designed as automatic increased the participation rates among new employees from 49% to 86% in a large U.S. corporation (Madrian and Shea, 2001, 1149-1187).

Default options and status quo bias can help to increase organ donations too. In one study, the way of the question was framed in three different versions and presented randomly to the subjects as follows:

- **Opt-in condition:** The default is to "not to be" a donor. (Mark the checkbox if you accept to be a donor in case of your death)
- **Opt-out condition:** The default is to "be" a donor. (Mark the checkbox if you "do not" accept to be a donor in case of your death)
- **A neutral question format:** Would you like to be a donor? Yes or No

When the questions were presented above to three different groups, the results remarked different participation rates. In the neutral format, the participation rate was 79%. When the question was presented as the first option, the participation rate was 42%, and it was 82% when the question was framed as an opt-out condition. Moreover, according to the data, countries that use opt-out conditions have much higher organ donation rates than those who use opt-in conditions. For instance, Belgium, who uses opt-out conditions, has 98% participation in organ donations, while in Germany, the participation rate is 12% since they use opt-in conditions in organ donations (Johnson and Goldstein, 2004, 1713-1716).

As examples demonstrate, it is possible to improve society's two problematic issues with small changes in designs: participation rates and saving amounts for retirement plans and participation rates in organ donations. The importance of behavioral public policies comes from the effectiveness of the policies: it aims to have small changes (costs) and significant improvements (benefits). Hence, understanding the cognitive ability of individuals and designing policies based on this fact is essential.

As a second cognitive bias and heuristic in this study, the framing effect assumes that decision-makers make their choices depend on how a set of identical choices presented (Gonzalez et al., 2005, 2). For instance, the previous organ donation example consists of a framing effect, too, since presenting factually equal options differently caused different individuals' preferences. Hence, individuals might act differently to the same outcomes, events, or situations in the presence of framing effect. Framing a glass as "half full" or "half empty" has different meanings, and it might evoke different feelings.



Framing a situation, a problem, or an outcome in many ways is mostly possible. From a rational perspective, decision-makers should be indifferent to all ways of framing as long as the choices are factually equivalent. Therefore, according to standard economic assumptions, the preference between a set of alternatives should not reverse when the choices are presented differently. However, some empirical findings demonstrate that there are some systematic violations in individuals' choices when they are framed differently. Individuals may be influenced by different frames of an equal outcome, partly due to the formulation of the problem and partly due to decision-makers' habits and personalities (Tversky and Kahneman, 1981, 453).

For instance, framing effect can be applied to reduce the usage of plastic and paper bags. Rewarding or punishing people can bring different results; therefore, the best strategy must be chosen depending on the context. In one study, the results demonstrate that, when a \$0.05 bonus was stressed if people use reusable bags, the usage of disposable bag decreased by only 2% (from 84% to 82%), while a \$0.05 penalty was stressed if they use disposable bags, the reduction was 40% (from 82% to 42%) in Montgomery County in the U.S. This might help to save 18 million disposable bags per year. (Homonoff, 2013, 2-4). This example explains the power of framing effect. If the governments desire a beneficial policy to be accepted by their citizens, framing effect might bring successful outcomes (Gilad et al., 1984, 7).

As another example of framing effect, framing the voting behavior can influence the participation rates in elections. According to the findings of one study, invoking the self can increase the participation rates much more than stressing the voting behavior. More specifically, emphasizing "being a voter" brought better outcomes than emphasizing the behavior such as "voting" regarding increasing the participation rates in the elections (Bryan et al., 2011, 12653-12654).

As discussed before, the U.K. is considered a leader in behavioral public policies, and BIT of the U.K. has some special public policy programs in other countries. For instance, in the Republic of Costa Rica, several types of messages were sent to firms to remind their taxes with the help of BIT of the U.K. The firms whose email addresses are saved in the system received two types of messages. The firms in the control group did not receive any reminding message. In the experimental group, half of the taxpayers received regular behavioral messages that remind them to pay their taxes, while the rest received the same behavioral messages with a piece of additional detailed information about the taxpaying rates of the other firms. As a result, behavioral messages increased the taxpaying rates from 11,5 % to 32,5%, and the detailed information about other firms increased the tax-paying rate to 34%. In another study conducted by the help of BIT of the U.K., 31929 taxpayers in Poland received several types of messages about their taxes. One group of taxpayers did not receive any reminding messages while some received an official email from the Polish Government, and some received a behavioral type of reminder. The results demonstrated that behavioral reminders increased the tax-paying rate by 17%, while the government's official email increased by only 8% (BIT, 2016, 67-69).

As several examples demonstrate, framing effect has a substantial impact on the decision-making process of individuals. According to the findings presented above, it is possible to increase the participation rates in elections and tax-paying rates, and help the environment by reducing the usage of plastic and paper bags by using different frames. Hence, the importance of cognitive biases and heuristics should not be underestimated.

Mental accounting also can help governments to design effective public policies. Mental accounting is a cognitive mental activity based on categorization, organization, and evaluation of the human brain regarding financial activities (Thaler, 1999, 183). According to Tversky and Kahneman (1981, 456), "mental account is an outcome frame which specifies the set of elementary outcomes that are evaluated jointly and the manner in which they are combined and a reference outcome that is considered neutral or normal." Hence, mental accounting can be considered a frame for assessment (Thaler, 1999, 186).

In one study, labeling a government transfer had a remarkable impact on the spending behaviors of families. When the government's financial aid for families was distributed with the label of "children aid", the probability of using this money for children's clothing was ten times more than other sources of money. It is assumed that labeling the income as "children aid" created an ethical



responsibility on parents to spend this money on children (Kooreman, 2000, 571-583). This result occurs due to the impact of mental accounting, and this explains why some sources of money that come from gambling can be spent easier than a regular income. This finding demonstrates that policymakers can influence their citizens' spending by labeling the money for some specific areas. It is essential to know that the governments reach their target in terms of their investment in some particular areas. As another example, a study in Morocco observes the influence of educational aid on school attendance in the elementary level. According to their results, the children whose families received educational aid from the government attended to school significantly more than those whose families did not receive aid from the government (Benhassaine, 2013 as cited in Madrian, 2014, 29). This example demonstrates that it is possible to increase the schools' attendance rates by giving out some social aids.

To sum up, it is possible to design effective public policies in some specific areas by using cognitive biases and heuristics, as illustrated in several examples above. Hence, understanding the characteristics of humans is needed to create practical public policies.

## CONCLUSION

This study aims to investigate the efficiency level of behavioral economics in designing public policies. Behavioral economics is a fresh branch of economics that uses psychological insights to explain individuals' and firms' economic behaviors. According to its findings, individuals do not act rationally in every case due to their low capacity of cognitive abilities, unlike standard economic assumptions claim. Behavioral economics analyzes some systematical cognitive biases and heuristics in the economic behaviors of individuals with the help of experimental methods. It is assumed that cognitive biases and heuristics are other sources of market inefficiency, and governments should intervene to fix these failures.

Traditional methods in designing public policies do not consider this fact, and thus the policies that are designed without this might not bring efficient outcomes in every case. Hence, designing policies by considering these irrationalities (cognitive biases and heuristics) might bring better outcomes than traditional methods in some cases. However, the behavioral way of policymaking does not deny the traditional way of policymaking wholesale. It instead assumes that there might be some specific areas in the society that governments should approach more sensitively and design more specific policies based on the issue.

Cognitive biases and heuristics are one of the most crucial sources of irrational behaviors of individuals. Therefore, the public policies that are desired to be efficient should consider them during the design process of public policies. For instance, by using default options and status quo bias, it is possible to increase the participation and savings in retirement plans. Hence, understanding of cognitive biases and heuristics are crucial to designing effective public policies. Shortly, when forming public policies, policymakers should consider humans' low capacity of cognitive abilities, since humans are the most basic target group of policymaking.

To conclude, understanding humans' cognitive structure is a crucial element in designing effective public policies in some specific areas. Moreover, it is assumed that further studies in cognitive biases and heuristics can contribute even more to efficient public policy designs.

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