

THESIS COLLECTION

Dudás Levente László

Ph.D. dissertation titled

Nudging the public:

**Relevance, antecedents and the level of public support
for behaviorally informed policies**

Thesis supervisor:

Szántó Richárd, Ph.D.

associate professor with habilitation

Budapest, 2022

Department of Decision Sciences

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1 Research background and relevance of the chosen field

The rise of behavioral economics to the mainstream of economic research has greatly extended our understanding of human judgment and decision-making. Daniel Kahneman and Amos Tversky shed light on how cognitive, psychological, cultural and social factors affect the decisions of individuals and how these vary from those implied by classical economic theory. Their findings were summarized in an excellent book by Kahneman titled "Thinking fast and slow". Reading that book, along with the book of Ariely and Jones "Predictably irrational", was the reason I became interested in pursuing academic research. Behavioral economics helped us understand the mechanisms of the non-rational influence on our decision making because of pioneer researchers like Daniel Kahneman, who was awarded the Nobel Prize for Economics in 2002 for his accomplishments. The modes of influence on the exact decision environment was further conceptualized by Richard Thaler and Cass Sunstein in their book "Nudge" (2008), where they coined the term 'choice architecture'. They discussed the different manipulating effects that have a larger than intuitively imagined effect on our decision making, and showed surprising evidence for the not exactly new (Lerner and Lasswell 1951) field of policy science. The concept discussed in the book of Thaler and Sunstein has become a huge academic success in the past decade. According to Google Scholar, as of early 2022, the book was cited more than ten thousand times and this number is still increasing, especially in view of the fact that one of the authors, Richard Thaler was, in 2017, also awarded the Nobel Prize for Economics for his relevant contributions to the field. As the justification for the prize claims, Thaler's work in the development of behavioral economics has helped it gain a better understanding of human behavior and formulate better predictions about it, which has a cumulative, significant effect on economics,

and, by the same token, it has helped to steer this slightly controversial, peripheral area towards the mainstream. As result, the conscious application of nudges in public policymaking (also referred to as behaviorally informed policies) has grown exponentially, so much so that some countries have even establish 'Nudge Units' to research opportunities and prepare proposals to apply nudges in policy (Whitehead et al. 2014).

My personal motivation has driven me to research nudges applied in a public policy, that steer people in the direction of better decisions. As the section concerning "the criticism of the use of nudges" in the systematic literature review article explains, this kind of influencing and the issue of formulating "the better decision" have given rise to heated debate among those dealing with nudges, ethics, and public policy making. My personal view is that the positive results available through the use of nudges should not be neglected, and their use should be extended to a conscious level, just like in the case of the United Kingdom, where a specialized "nudge unit," the Behavioural Insights Team has been established, dedicated to the support of the government's decision making. I would endorse this practice as long as it is based on well-established research, it presents its findings in a transparent manner, and it is openly communicated to society (in general, not necessarily in the given decision-making environment in which a nudge is applied). In this way, a social discourse can develop as to what is an acceptable extent of influencing and what is not, and the use of nudges, which do not conform to the values of the population, can be rejected.

During the course of my doctoral studies the pandemic situation caused by COVID-19 has become a critical aspect in all of our lives, therefore I wanted to reflect it in my research. The real life implication of support for the preventive policies directly translated to the effectiveness of pandemic defense, and therefore meant lives. Obviously the topic captivated my scientific curiosity and I

wanted to tackle it with novel scientific research to provide timely insights to an eager worldwide audience. One topic that emerged relating to nudges was comparisons in level of public support for and compliance with very strict or advisory measures aiming to contain the pandemic. When the pandemic broke out, the main objective of responsible researchers in social science was to understand what factors contribute to people complying with the preventive measures and for this reason we investigated these factors by measuring support for these policies. The natural environment also provided the opportunity to observe a very specific context, one in which the perception of risk is very high and most members of society feel very involved in the surveyed topic. For these studies I had to also dig deep into the rich field of risk research, and for this reason my last study is concerned mainly with the relationship of risk perception and Covid skepticism, which are key in the belief and opinion formation processes about preventive policies.

Research frame

The relation of research questions, publications and results of the studies I conducted and compiled in my dissertation are shown on [Figure 1](#). The foundation of my dissertation was a systematic literature review on nudges applied in public policy. This review and categorization exercise did not only provide a good summary for interested readers on the mechanisms, application and criticisms of nudge, but also helped me to find emerging research questions of the literature, that are worth to explore. The literature review surfaced that there are many different modes of action and many different domains that nudges can be applied on. At the time when I started my dissertation there were two influential studies on the topic of public support for behaviorally informed policies, [Jung and Mellers](#)

(2016) and Reisch and Sunstein (2016) researched attitudes toward nudging with large American and European samples respectively. They also used various types of nudges applied to various fields, showed differences but tried to draw overarching conclusions. I was interested in exploring the underlying effects, how the domain, the mechanism or the current context might affect the support for the policies. For this reason, I included nudges from 7 different domains to be able to observe the domain effect in Study II, and also in Studies III and IV policies under extreme circumstances due to the pandemic provided a special context to research.

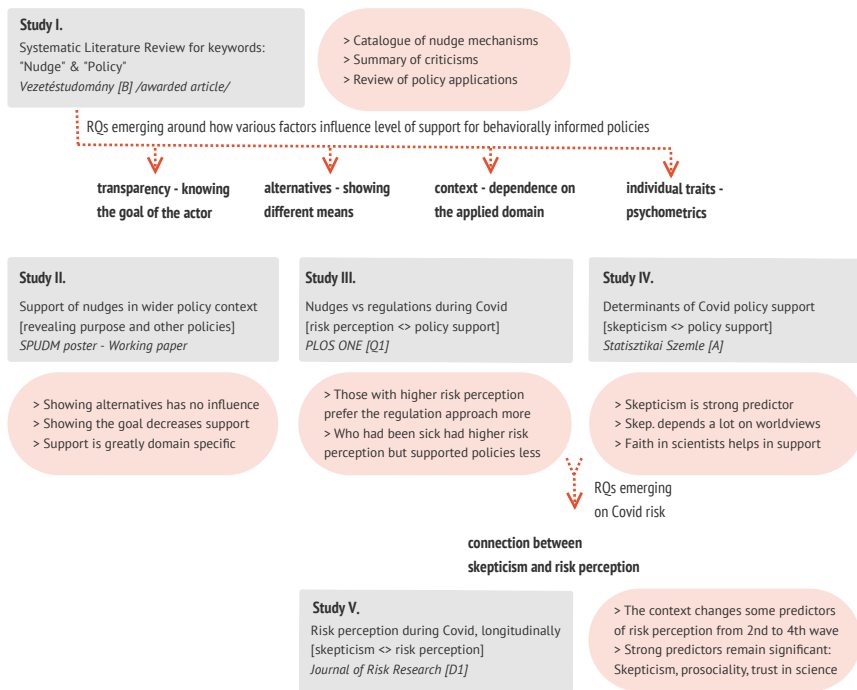


Figure 1: Relation of research questions, publications

Another phenomenon emerging in the literature was that nudges often compete with the more traditional policy toolbox (regulations, financial incentives). [Hagmann et al. \(2019\)](#) even found that the introduction of nudges can crowd out support for stricter measures. I found it an interesting question to measure support for different type of policies that have the same goal, and this was central part of Study II, in which I compared support of five different types of policies with the same goal (regulations, positive financial incentives, negative financial incentives, subliminal nudges and transparent nudges), and also in Study III, in which I compared regulations and nudges employed as preventative Covid containment policies. This comparative surveying I found also apt to lead to a more ethical practice. The literature review also revealed the criticisms of nudge, two of which could also be addressed with surfacing multiple forms of policies and making the public more aware of their common intent. Nudging can be manipulative as it is not transparent for the citizens that their behavior is intentionally influenced, and the political actor can be seen paternalistic, trying to influence the citizens 'for their own good'. These issues could be remedied by revealing the purpose of the actor and the available means to get to their goal. In Study II, we explored the effect of these different frames: showing only the policy; showing its purpose as well; and showing both the purpose and the various alternatives. Thus we hoped our findings can lead to the application of nudges more ethically.

The influence from cultural background and psychological traits of the respondent is again a deep field for nudge effect and nudge acceptance research. The literature showed numerous articles that found different attitudes toward or different effects from nudges. Some elements of this I also tried to incorporate in my research, as was fitting to each of the studies. In Study II, where the purpose of the policymaker was revealed, we expected reactant individuals to behave differently than others when the topic of influencing and the feeling of manipulation

might arise, so we included a psychological reactance questionnaire in our survey to measure its association with policy support under different frames. In Studies III and V we measured the Covid related risk perception, while in Studies IV and V we measured individuals worldviews, trust in various institutions or people, as well as their Covid skeptic stance. In the context of the pandemic these attitudes were important for support and compliance with the preventive policies. Study V was building more on findings of my previous Covid related studies and not on the initial literature review. In that case I found the connection between skepticism and risk perception a topic worth to further explore based on the findings of the earlier research and on a review of the existing wealth of risk research.

2 Methods applied and scientific results of the dissertation

2.1 Study I. The inner workings of choice architecture. The theory, mechanisms and criticism of nudging

Methods

The systematic literature review article is based on a selection of 129 articles, which were obtained as results of a query of the EBSCO database. We searched for peer-reviewed academic journal articles published between 2008 and September 2016 that contained the keywords “nudge” and “policy” in their abstracts. After reviewing the abstracts, we filtered out 20 papers which were either irrelevant to our research, or interpreted the concept of nudges too widely, or they merely mentioned it in passing. Furthermore, 30 other papers were also excluded from the review, since they covered such wide-ranging topics that they did not fit this comprehensive synthesis. The primary focus of our synthesis was those applications and phenomena which might make nudges effective, and we also focused on academic papers discussing the policy application of nudges or on the concerns regarding the use of nudges.

Results

- 1.1 The paper classifies the different ways of realizing effects from nudges. This nudge catalog identifies twelve modes of actions how nudges operate. The catalog of nudges’ modes of action connects the behavioral theory to the applied form of choice architecture in the context of political science, and building on that, with a wide range of examples highlighted from existing research, it introduces exact instances of their policy applications.
- 1.2 The majority of papers featured in the literature review articulate criticisms

about the concept, which led us to believe that it is probably imperative for the future success of the concept that the proponents of nudges give reassuring answers to the critics' concerns. We identified four big groups of criticisms (grand narrative; paternalism; transparency and manipulation; practical problems).

1.3 The paper also reviews on what domains are these nudges in public policy applied. Nearly two-thirds of those papers were concerned with healthcare (healthcare issues in general or comprehensively, and also some of the specific areas like diets). There were a smaller number of papers concerning environmental issues, as well as pension scheme incentives. Other topics came up much less frequently.

1.4 We found many of the papers were concerned with examples from the United Kingdom. This is not surprising, but it raises the issue of cultural effects and also to what extent can we generalize the studies that have been conducted so far.

2.2 Methodological approach for the empirical studies

All four empirical studies utilized survey research, because in all of them we looked for answers regarding public opinion and attitude questions. The surveys were developed rigorously and sampling was considered carefully to avoid errors associated with the respondents or their answers (Fowler Jr 2013). One requirement of professional research is that it should have internal validity, meaning to ensure that we measure what we intended to measure. For this reason, the question items underwent appropriate scale development for each survey. We also did pretesting with a score of respondents and briefly interviewed them to further polish the questionnaires and make sure they are understood the same way and

exactly as we intended. All participants provided informed consent to use their responses in our research. The exact statistical methodology with which we analyzed the results was customized to each study accordingly, because we aimed to have a rigorous analysis in each case.

The main method of public opinion and attitude research is of course the survey research, but researchers of public opinion frequently embed experimental elements in opinion surveys which I also embraced with all of its advantages and challenges (Gaines et al. 2007). Some of the surveys I employed also had experimental elements as a split ballot survey, and looked for the effect of differently framed questions (Study II) or the effect of question order and priming (Study IV). I was very keen to include experimental elements to increase the value of my findings. Together with a sound survey development and appropriate sampling, it should aid my research to have a good internal and external validity, and reliability (replicability) which are the main components social science research validity (Drost 2011, p. 106). The representative sample of Study III, the experimental elements in Studies II and IV, and the longitudinal nature of Study V also enhances external validity, so that the results of my studies can be generalized and used to predict behaviors in real life. As Koltai et al. (2015) puts it, the controlled experiments are a great method for social science research because it is ‘good enough’ in all three dimensions, instead of a method which performs perfectly in one dimension but fails in the other sections.

2.3 Study II. Support of nudges in wider policy context. A survey experiment

Methods

The research question in this study was whether public support for policies with subliminal nudges change, when people are more informed, i.e. consider the

purpose and the alternatives. We assessed people's opinion across seven different topics, where behaviorally informed policies are common. Psychological reactance of the respondents was also assessed with a range of 14 items. In the study participants were allocated to three conditions randomly. In condition 1 participants rated system 1 nudges in seven different domains. In condition 2 the purpose of the same system 1 nudges were revealed to the participants. In condition 3 besides the purpose, four other competing policy alternatives were presented to the subjects, and they were expected to rate all policy options. In the online questionnaire for attitude questions a 7-point-scale was used, in order to find out to what extent participants support policy alternatives and to what extent they think alternatives are effective. For the study we recruited 319 students studying business administration at a major Hungarian university for this study. Subjects completed an online survey in November 2018 using 'Qualtrics' software. During the statistical analysis an ANOVA test was conducted to compare the support level in the three samples relating to the three experimental conditions, while correlational coefficients were analyzed to understand associations between reactance trait and policy support.

Results

2.1 We focused on system 1 nudges since they usually operate in the dark, therefore they tend to be also less accepted. Our findings suggest that this generally lower levels of support cannot be explained with people not being fully aware of the purpose of the policy makers, since raising awareness of that purpose even reduced the support for the nudges in our sample. This should caution policymakers on the application of nudge and calls for further research about properly applying and communicating behaviorally informed policies.

- 2.2 People keep their reservations about subliminal nudges when they learn what these policy interventions may be substituted with. Offering a variety of policy alternatives that work toward the same purpose did not effect the support for system 1 nudges in our study.
- 2.3 Our findings suggest, that public support for nudges is greatly influenced by the domain where the nudge is introduced. This may question an assumption made by most studies dealing with public support of nudges, namely that support for domain-specific nudges can be simply aggregated.
- 2.4 The reactance trait was not as strongly associated with nudge support as we hypothesized. When we checked for the strength of correlation between the overall reactance index and the level of subliminal nudge support, we have found no statistically significant association in either condition, so we can not affirm a difference in attitude for people with reactant traits.

2.4 Study III. Nudging in the time of coronavirus?

Methods

It was established in literature previously, that people support nudges more than strict regulations on the same domain. We set out to test the truth of this in an extremely tense situation like the coronavirus pandemic and understand how it relates to individuals risk perception, by a survey. We collected a sample representative of the adult Hungarian population under the age of 64 in terms of demographics (age, gender, education). One thousand Hungarian participants were recruited for this study via an online omnibus survey. We measured COVID-19 risk perception with a range of items that covers affective, cognitive, and temporal-spatial dimensions of risk perception based on [Dryhurst et al. \(2020\)](#). The construct contains six items: (1) level of worry, (2) perceived likelihood of

direct personal effects, (3) perceived likelihood of direct effects on family members and friends, (4) personal beliefs about how many people in the country will be affected, (5) perceived probability of getting sick, and (6) getting sick seriously. We asked for opinions on three hard and three soft policy measures that participants had to rate for extent of support. For all of the above items a 7-point Likert scale was used. The policies we call softer, can be categorized as system 1 nudges, while the harder policies, are strict mandates. The respondents' experience with COVID-19 was also assessed in the survey. When asking direct experience respondents had to answer whether they had COVID-19 or not. Surveying indirect experience we inquired if anyone in their direct environment (family members, close friends) have been infected with the coronavirus?

We evaluated policy support in a dichotomized form with contingency table based χ^2 tests as well as on the original distribution of responses given on the seven point scale, and tested the difference in support using non-parametric Wilcoxon – Mann – Whitney tests. We investigated the association between risk perception and soft and hard policy support with Pearson correlation coefficients and calculated coefficients for the three areas separately as well, because validity indices suggested they should not be aggregated. To evaluate the effect experience had on risk perception and policy support we took the Cartesian product of the two binary, experience variables and evaluate the mean risk perception, support for regulations and support for nudges across the four groups using the constructed indices. We used the Kruskal–Wallis test for one-way analysis of variance to determine differences in distribution among the groups, and complemented it with pairwise analysis using Mann–Whitney tests with Bonferroni correction to correct for multiple comparisons when calculating significance. This provided us with an understanding of the association between the experience with the disease and the other main variables separately, but to be able to focus more

intently on the interaction of experience and risk perception, and how they can correspond to support for the policies, we also fit a regression model. Nudge support index and the regulation support index are defined as dependent variables in the OLS regression models, and risk perception index, the experience variables, and the interaction terms between risk and experience are included as independent variables.

Results

- 3.1 In our representative sample the preventive policy measures were generally supported, and there were no clear pattern to whether hard or soft policy measures were preferred. There was a moderate correlation between the risk perception index and the approval of both regulatory and nudge interventions. This level of correlation was similar across all prevention areas. Moreover, we found that people with a higher level of risk perception favor regulatory approaches slightly even more.
- 3.2 Based on the results of our study we advise against the sole use of nudges in a pandemic that has brought unprecedented risks to most societies, since they suggest that the presence of high risk increases the public's preference for stricter regulations. If governments underplay the seriousness of the pandemic, which would therefore make people perceive the level of risk lower, that would undermine the public acceptance of any preventive measure.
- 3.3 Somewhat surprisingly, there seem to be two contradicting effects on policy support for people who already contracted the disease. While the experience's contribution to a higher risk perception should increase the level of support, there is also a tendency to support the preventive measures less.

3.4 The direct experience negatively influences policy support, so in the early stages of a pandemic policy makers should pay special attention to those who had already contracted COVID-19. They may diminish the public support of the preventive measures because of their selfish desire to get back more freedom, stemming from a feeling of immunity.

2.5 Study IV. What influences the support for anti-epidemic measures?

Methods

The questionnaire items for studies III, IV and V are partially overlapping. We used the same risk perception, policy support and experience variables as described in the section detailing methods for Study III. Although, from the policy support items we only used a subset, as we were not focused on differences between different types of policies. Instead of showing a regulation - nudge pair for each domain, out of the two we used only the policy that was actually in place at the time. These have been complemented by a range of items attempted to measure Covid skepticism, the worldview of the respondents and their trust in the competence of certain groups. The questions measuring skepticism about COVID-19 were answered on a 7-point Likert scale. The questions were phrased as: "To what extent do you agree with the... (statement)?" We presented such statements as 1. fatality statistics grossly overestimate the danger of the virus; 2. face masks are not effective; and 3. the economic damage caused by the restrictions is more severe than the health benefits thereof. We mainly focused on the relationships between risk perception and policy support in Study III, Study IV explores the relationship between skepticism and policy support, and how factors that determine policy support are connected. There was also an experimental element to the research, to handle the 'context effect' that can arise from the order

of questions (Brecsok and Németh 2020). We randomly arranged the question blocks, and to measure the effect of this, we introduced a variable indicating the sequence when designing the questionnaire, as is customary in political and psychological research (split ballot testing) (Gaines et al. 2007).

Survey participants for this study were recruited from students at Corvinus University of Budapest. The survey was conducted online. Given, that we wanted to explore the relationship of eight observed and two latent variables we used covariance based structural equation modeling (CB-SEM). Before analyzing the paths and the fit of the SEM, we ran reliability analyses on the measurement model, to test whether the items skepticism and policy support are consistent with the respective latent variables. In our research we treated the answers given on the 7-point Likert scales as ordinal variables and for this reason we calculated the reliability measures from polychoric correlations, rather than Pearson correlations, and used diagonally weighted least squares (DWLS) approach, and we also used the validity indicators obtained with the adjusted calculation method matching the ordinal variables.

Results

- 4.1 Skepticism towards the coronavirus has considerable predictive power regarding the support for preventative epidemiological measures. Our findings suggest that policy makers have to pay attention and react to counter-arguments when formulating preventative epidemiological measures.
- 4.2 The measurable effect of the order of questions supports this idea as well: when rating skeptical arguments preceded the questions about the support for the preventative epidemiological measures, respondents tended to believe less in these measures.

- 4.3 The two worldviews we examined (individualism and social solidarity) were important influencers of COVID skepticism in our model. A high level of pro-social attitude decreases people's doubts, while an individualistic worldview tends to increase it. Social solidarity can, at the same time, be a direct predictor of support for preventative epidemiological measures as well. This means that those people can also support preventative measures who are skeptical about the coronavirus, but they have solidarity for the rest of society.
- 4.4 In this study we also found that direct and indirect experiences with the COVID-19 disease have diverse effects on the rejection of the coronavirus. If a family member or a friend contracts the disease, it will lower the level of skepticism, while direct experiences will increase it.
- 4.5 A lack of faith in scientists is an important source of COVID skepticism. Those who think that scientists do not or only partially possess relevant knowledge about the coronavirus are more susceptible to skeptical opinions. The contribution of faith in scientists to the greater support of policy measures can only be partially explained by its effect on COVID skepticism. Thus, those who are less skeptical about the COVID-19 epidemic will continue to support preventative measures if they have trust in the word of scientists.
- 4.6 Contrary to our initial assumption, we found a negative association between trust in others and policy support. Meaning, when people trust others less, they demand stricter regulations to curtail the spread of the virus and guarantee their own safety, and they want the government to enforce such regulations.

2.6 Study V. COVID-19 skepticism and the perception of risk

Methods

For this study we used the same survey as for Study IV, and partially the same sample as well, but also performed a repeated data collection almost a year later with research participants recruited the same way. So, data collection took place between the 16th and 24th November 2020 and between the 20th and 27th September 2021. It is also an important difference, that in this study we focused on the relationship between Covid skepticism and the perception of risk. To analyze the data, we fitted linear regression models for both samples using the index variables for risk perception and skepticism. We applied the regression model first on the conceptualized mediator variable (COVID skepticism) with a reduced set of antecedents. The assumed predictors of COVID skepticism were the respondent's worldview, experience with the virus and trust in scientists' variables as predictors. In a second step, we regressed our main dependent variable (risk perception) on the mediator (skepticism), all of the mediators predictors and the remaining surveyed antecedents; trust in others, trust in government and gender. We ran model diagnostic steps to confirm a good approach. As part of the mediation analysis, we performed a simulation separately for each of the five variables assumed to be mediated by skepticism.

Results

- 5.1 We saw the risk perception of young adults slightly decrease from the second to the fourth wave in all measured aspects except the seriousness of the sickness. Vaccination has become widely available in 2021, people have become more and more familiar with the virus and over time they are likely to develop 'worry fatigue'.

- 5.2 We also observed a shift between the two samples regarding which variables are associated with risk perception in our model, but skepticism and pro-sociality proved to be very important predictors in the second and the fourth waves alike, and trust in scientists and the worldviews of the individual were also consistently associated with risk perception indirectly, through skepticism.
- 5.3 People with a strong pro-social attitude tend to be less lenient toward a skeptical stance, and perceive the risks to be higher, while individualistic worldviews are more prevalent among those with a skeptical stance, which then leads to lowered risk perception.
- 5.4 Skepticism is negatively associated with trust in scientists, meaning, those who believe that scientists possess the necessary knowledge related to the coronavirus, are less receptive to skeptical arguments.
- 5.5 We find from the repeated nature of our survey research that the way trust in scientists and government is associated with risk perception is influenced heavily by the discourse at the time. The messages conveyed by the government and scientists during the second wave were rather different and this translated to opposite influence in our model. During the fourth wave the government choose a respected professor to convey its main messages and that translated this effect to disappear.
- 5.6 Direct and indirect experience with the disease had opposite effects on COVID skepticism, the direct experience increasing while the indirect decreasing it. Also, the direct experience became a better predictor as more people got the disease by the second sample, but indirect experience lost relevance in the model as it got ubiquitous.

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