The prominence effect in health-care priority setting

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Abstract

People often choose the option that is better on the most subjectively prominent attribute — the prominence effect. We studied the effect of prominence in health care priority setting and hypothesized that values related to health would trump values related to costs in treatment choices, even when individuals themselves evaluated different treatment options as equally good. We conducted pre-registered experiments with a diverse Swedish sample and a sample of international experts on priority setting in health care (n = 1348). Participants, acting in the role of policy makers, revealed their valuation for different medical treatments in hypothetical scenarios. Participants were systematically inconsistent between preferences expressed through evaluation in a matching task and preferences expressed through choice. In line with our hypothesis, a large proportion of participants (General population: 92%, Experts 84% of all choices) chose treatment options that were better on the health dimension (lower health risk) despite having previously expressed indifference between those options and others that were better on the cost dimension. Thus, we find strong evidence of a prominence effect in health-care priority setting. Our findings provide a psychological explanation for why opportunity costs (i.e., the value of choices not exercised) are neglected in health care priority setting.

Keywords: prominence, policymaking, health care, decision-making, bias, replication

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1   Introduction

Health economics is often thought of as inhumane, promoting efficiency at the expense of more profound moral values, such as equality, need and patient safety. The fact that allocations solely based on cost-effectiveness are unlikely to be compatible with public views has been illustrated in experimental studies (e.g., Nord, 1999; Ubel, Loewenstein, Scanlon & Kamlet, 1996), surveys from different countries and health care settings (e.g., Ahlert & Schwettmann, 2017; Tinghög & Strand, 2022; van Excel et al., 2015), and in reactions to actual health care policies (Alakeson, 2008; Hadorn, 1991; Sabik & Lie, 2008; Tinghög, 2016). Moreover, research has shown that people who make judgments that are in line with cost-efficiency and health maximization in sacrificial moral dilemmas are more disliked on a wide range of measures (Everett, Pizarro & Crockett, 2016; Everett, Faber, Savulescu & Crockett, 2018), and less frequently chosen as social partners (Uhlmann, Zhu & Tannenbaum, 2013). From the perspective of a health economist this can be difficult to understand.

Why isn't the quest to maximize the value for money something that strikes a chord with the general public? We believe that a main reason lies in the psychology of human nature and our tendency to focus on aspects that frighten us while neglecting non-focal, less prominent attributes at the point of decision making (Kahneman & Frederick, 2005; Karelaia & Hogarth, 2008; Slovic, 1975; Tversky, Sattath & Slovic, 1988). This "prominence effect" implies that we as humans struggle with making trade-offs between competing values and instead base our decisions on what we feel is the most prominent – the most important, defensible – value. So what does this have to do with health care priority setting? A lot. It is well recognized that decisions on how to allocate scarce health care resources are among the most emotional, complex and controversial choices facing public decision makers. Although each situation is unique, priority setting typically involves tradeoffs that pit the lives and well-being of some individuals against the lives and well-being of more distant others (Tinghög, 2011; Wiss, Levin, Andersson & Tinghög, 2017).

A general objective of any health system is to maximize people's health and well-being given existing resources and other well-defined priority criteria. This means that resources must be repeatedly reallocated in order to meet new and existing challenges. However, the upshot of the prominence effect is that any proposed reallocation of resources involving a health-health tradeoff that operates via money will be met with resistance, even if people find the policy reasonable in principle. This is because the prominence effect is likely to be amplified by the fact that health is of special moral importance to most people. Not only one's own health, but other people's health as well. Health is sometimes a sacred value that

many people are reluctant to trade off, no matter what the benefits of doing so may be (Baron & Spranca, 1997; Fiske & Tetlock, 1997; Tetlock, 2003). This is problematic because it means that cost-efficient reforms in healthcare will be opposed even when they are welfare improving. Moreover, this might apply not only to the general public but also to medical decision makers and policy makers, because the prominence effect is a decision-making bias that originates from basic and powerful psychological tendencies. The prominence effect can help explain the inertia of health systems and why it is so difficult to implement cost-containment policies. In this article, we report the findings from a large-scale experimental study investigating the relevance of the prominence effect in the context of health care priority setting. Participants were drawn both from the general population in Sweden and from a sample of international experts on priority setting in health care. Decisions made by experts are particularly interesting in this case because they are experienced in both valuing different medical treatments and in choosing between them.

1.1   The prominence effect

Slovic (1975) and Tversky et al. (1988) developed the theoretical concept of prominence and introduced an empirical paradigm for studying it. The prominence effect rests on the idea that it is important to people to be able to justify and defend their values, which becomes more relevant for values that are revealed through choices than for values that are revealed through direct expression or ratings. Choices thus give dominant importance or value to prominent objectives in ways that may violate stated non-choice preferences. The prominence effect predicts that individuals who are required to choose between two different health programs (or treatments) will choose the program that is better on the more important dimension, even when they think that other programs are equally attractive or important in principle. Exactly what dimensions that are prominent will depend on the context and vary from case to case. Defensibility (or justification) and salience of specific attributes are potential underlying reasons for prominence. Affect likely contributes to the defensibility of a choice (Zhang & Slovic, 2019). A plausible assumption for healthcare is that the health of an individual patient is more important than monetary considerations, even when money would be used to fund other health policies that could improve overall care for the population of patients.

We examined the prominence effect in the context of health care priority setting using a large-scale survey experiment. Participants revealed their valuation for different medical treatments in hypothetical scenarios through both direct expression of underlying values and choice. We hypothesized that the health of patients would be more important than the cost of treatment, to the extent that participants' choices would systematically favor treatments that were better on the health dimension than other options that were better on the cost dimension, even when participants had previously expressed indifference between those options.

2   Study 1 – General population

2.1   Method

The study and main analyses were preregistered at https://aspredicted.org/TX1_NDX. The data is available at the project's OSF repository (https://osf.io/5pmf3/)

Participants.   Participants were recruited in collaboration with Origo Group and drawn from a sample of the general adult population represented in their subject pool (n = 1,217, 50.9% women, mean age = 51.0 years). Participants received a small monetary payment upon completion of the survey. Target sample size and ex-post exclusion criteria were determined before data collection began, see the preregistration for details. All participants gave their written informed consent to participate in the study. Half of the respondents (50.8%) had university-level education and 17.8% had some form of educational experience or work experience from health care. The sample is close to the Swedish population statistics for age and gender but there is an underrepresentation of individuals with low income and education.

Design.   We used the within-subjects design of Slovic (1975), whereby participants first equated pairs of choice alternatives and then, later, choose between these previously equated alternatives. Our experiment concerned pairs of medical treatments that were described in hypothetical scenarios where participants took on the role of a healthcare professional. There were two stages of the experiment. In the first stage, each scenario concerned a specific medical condition and a pair of medical treatments. The two treatments were identical in all respects except for the risk of severe side effects, which was zero for one treatment but positive for the other treatment. Each scenario featured the cost of the riskier treatment but not the cost of the safer treatment, which was left blank for participants to fill it in; they were instructed to express a valuation (in terms of monetary cost of the safer treatment) that made both treatments equally attractive. In the second stage, participants faced the same scenarios again, and everything was identical except that their first-stage cost estimates for the safer treatments were included as well. This time participants had to choose between the two treatments in each scenario, meaning that they made choices between alternatives exactly at a previously stated indifference point.

Materials.   There were two scenarios in the experiment, the cancer scenario and the spinal disk herniation scenario. Table 1 shows the cancer scenario, where appr. one thousand Swedish adults needed immediate treatment, otherwise they would die within one year. There were two possible treatments that were identical except that with one of them 1% of treated individuals would die whereas nobody would die with the other treatment. The second scenario concerned spinal disk herniation where appr. three hundred Swedish adults were bedridden and in severe pain and thus in need of immediate treatment. There were two

possible treatments that were identical except with one of them 2% of treated individuals would become paralyzed from the waist down whereas nobody would become paralyzed with the other treatment. A transcript of both scenarios and the relevant instructions can be found in the online Supplementary material. The experiment was conducted online as part of a survey that included other questions as well.[1]

TABLE 1: The cancer scenario as presented to participants in the first stage.

	Treatment 1	Treatment 2
Type of illness	Cancer	Cancer
Who is affected by the illness?	All adults	All adults
In what country will the treatment be implemented?	Sweden	Sweden
Number of patients currently in need of treatment	Appr. 1,000 patients currently need treatment	Appr. 1,000 patients currently need treatment
Life expectancy without treatment	1 year	1 year
Life expectancy with treatment	10-15 years	10-15 years
Risk of serious complications with treatment	1% die immediately during treatment	Nobody dies from treatment
Cost of treatment	1,000,000 SEK per patient	??

Study timeline.   The sequence of stages and questions were the same for all participants. In brief, the survey begun with general instructions and then participants responded to a series of questions unrelated to the current study. Then came the matching stage, where participants equated pairs of treatments (by specifying cost), first for the cancer scenario, then for the spinal disk herniation scenario. At this point participants were unaware that they would later be asked to choose one of the two treatments in each scenario. This stage was followed by another series of questions unrelated to the current study. Then came the choice stage, where subjects were instructed to choose between two possible treatments in each scenario. The scenarios were the same and were presented in the same sequence as in the first stage, except that participants' cost estimates were now included as a given for each scenario. The survey finished with a few background questions.

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[1]The full survey contained an initial part designed to investigate cost neglect (e.g., of opportunity costs) in public and private decision-making (Persson & Tinghög, 2020), then came the part reported on in this paper, designed to investigate prominence effects, and finally there were some background questions at the end.

Statistical analysis. The main analysis plan was specified before data collection began, see the preregistration for details. For each scenario we calculated the key dependent variable Pr.-less-risky as the proportion of participants who chose the less risky (but more costly) treatment in that scenario. We followed our standard operating procedure outlined in the preregistration and excluded participants who expressed a valuation for the safe treatment that did not exceed the cost of the risky treatment. In our main, confirmatory, analyses we test Pr.-less-risky against a null hypothesis of random choice (prop. = 0.5) using a one-sample z-test for each scenario. We follow up with planned exploratory analyses to assess whether the prominence effect is different for men vs. women and for participants with vs. without healthcare work experience (see Supplementary Material Table S1), and we conduct an unplanned exploratory analysis to assess whether the prominence effect depends on the cost specified by subjects in the matching task (stage 1, see Supplementary material Table S2).

2.2 Results

Table 2 shows the general results from the survey experiment. Six hundred sixty participants provided consistent first-stage valuations in the cancer scenario, and 844 participants in the spinal disk herniation scenario. Our main analyses confirm that the majority of participants chose treatments that were lower on the health risk dimension; the proportions were 0.90 (SE = 0.01) in the cancer scenario and 0.94 (SE = 0.01) in the spinal disk herniation scenario. We can thus clearly reject the null hypothesis of random choice between equally valued treatments. This effect is similar for men vs. women and for participants with vs. without healthcare work experience, see Supplementary Material Table S1.

TABLE 2: Choices for equally valued medical treatments separated by scenario.

Scenario	Dimension		Pr. choice less risky[a]	z-test (H0: Pr. = 0.5)
	Prominent	Secondary		
Cancer	Health risk, death	Cost of treatment	0.90 (0.01) [n = 660]	P < 0.001 [z = 20.5]
Spinal disk herniation	Health risk, paralysis	Cost of treatment	0.94 (0.01) [n = 844]	P < 0.001 [z = 25.8]

[a] *Pr. choice less risky* is the proportion of participants who chose the treatment that had a lower health risk, i.e., the treatment that was better on the more important (prominent) dimension. Standard errors in parentheses.

3　Study 2 – Experts on health-care priority setting

3.1　Method

The study and main analyses were preregistered at OSF and the data and preregistration are available at the project's OSF repository (https://osf.io/5pmf3/).

Participants.　Participants were recruited via email from the International Society on Priorities in Health (ISPH) mailing list. ISPH is an international forum for health researchers, clinicians and managers involved in priority setting.[2] All participants gave their informed consent to participate in the study. One hundred eighty-three subjects took up the survey, 148 completed the first part, about opportunity cost neglect (for design & results, see Persson & Tinghög, 2020), 131 began the second part, about prominence (the focus of this paper), and out of those, 126 (96%) finished that part, and almost all of them (n = 124) answered all background questions at the end. Mean (SD) age was 51.6 (13.4) years and 53.2% were women. A clear majority of participants (n = 102, 82.3%) had current or past experience from working with healthcare priority setting, as a clinician (11.3%), researcher (57.3%), and/or policy maker (20.2%). Fifty-six percent had an academic background in Health Economics, Medical Ethics or Public Health.

Design & materials.　Survey design and content was identical to Study 1, except that the survey was translated to English and background questions about income and work experience in health care were replaced with more detailed questions about academic background and experience from working with healthcare priority setting.

Statistical analysis.　The main analysis plan was identical to Study 1 and specified in the preregistration; we test *Pr.-less-risky* against a null hypothesis of random choice (prop. = 0.5) using a one-sample z-test for each scenario. We follow up with planned exploratory analyses to assess whether the prominence effect depends on the cost specified by subjects in the matching task (Stage 1, see Supplementary Material Table S3), and we conduct an unplanned test comparing the prominence effect between subjects in Study 1 (general public) and Study 2 (experts).

3.2　Results

Table 3 shows the general results from the survey experiment. One hundred seven participants provided consistent first-stage valuations in the cancer scenario, and 113 participants in the spinal disk herniation scenario. Our main analyses confirm that the majority of participants chose treatments that were lower on the health risk dimension; the proportions were 0.81 (SE = 0.04) in the cancer scenario and 0.86 (SE = 0.03) in the spinal disk herniation

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[2]https://prioritiesinhealth.org

scenario. We can thus clearly reject the null hypothesis of random choice between equally valued treatments. The results were very similar in the subsample of participants with experience from working with healthcare priority setting (cancer scenario, pr. = 0.82, SE = 0.04, n = 87; spinal disk herniation scenario, pr. = 0.87, SE = 0.03, n = 94). In comparison with results for the general public, in Study 1, the proportions here are smaller; 0.81 vs. 0.90 for the cancer scenario (difference = 0.085, SE = 0.039, z = 2.58, P = 0.01, n = 767), and 0.86 vs. 0.94 for the spinal disk herniation scenario (difference = 0.086, SE = 0.034, z = 3.46, P < 0.001, n = 957).

TABLE 3: Choices for equally valued medical treatments separated by scenario.

| Scenario | Dimension | | Pr. choice less risky[a] | z-test (H0: Pr. = 0.5) |
	Prominent	Secondary		
Cancer	Health risk, death	Cost of treatment	0.81 (0.04) [n = 107]	P < 0.001 [z = 6.5]
Spinal disk herniation	Health risk, paralysis	Cost of treatment	0.86 (0.03) [n = 113]	P < 0.001 [z = 7.6]

[a] *Pr. choice less risky* is the proportion of participants who chose the treatment that had a lower health risk, i.e., the treatment that was better on the more important (prominent) dimension. Standard errors in parentheses.

4 Discussion

We found a strong and robust behavioral pattern that is consistent with the prominence effect in the context of health care priority setting. A large proportion of participants both among a diverse sample of the Swedish population and an international sample of priority setting experts chose treatment options that were better on the health dimension (lower health risk) *despite* having previously expressed indifference between the same treatment options. Among our diverse sample of the general Swedish population 92% of all choices focused on risk minimizing (prominent dimension) rather than cost of treatment. The corresponding proportion among the international sample of priority setting experts was 84%. These results are thus in line with our hypothesis, and they are robust to the severity of health risks, which varied across the scenarios. The inconsistency between choice and evaluation is striking and implies that opportunity costs are likely to be neglected in health care priority setting.

A key motivation for this study was to explore the prominence effect in an applied context of health care priority setting. Here, the discourse on patient safety and health care priorities typically revolves around the special importance of full patient safety (zero risk) compared to other values. We incorporated this in our design, where one treatment option

always featured the possibility of full harm avoidance. This setup also makes it plausible from an a priori point of view to argue which attribute should be considered prominent. Zhang & Slovic (2019) found that the possibility of avoiding harm completely is a powerful reason for choice, and this is in line with the strong results in the present study. It is possible that the prominence effect would be less pronounced for cases involving a milder contrast between expected harm from the different treatments (e.g., comparing 1% and 2% risk instead of 0% and 1% risk).

Strengths and limitations of the study.   Our study has several strengths, including a unique sample of priority setting experts combined with a large diverse sample of the general population, and a preregistration protocol. We use a within-subjects design where participants act as their own controls. This is a powerful design that enables a stringent test of the prominence effect, but it also comes with the weakness that a non-negligible proportion of participants expressed inconsistent monetary valuations for health risks in the first stage of the experiment. We followed our standard operating procedure from the preregistration and excluded these observations from analysis. A clear majority of these responses are likely protest bids, which is a common problem that is difficult to avoid for any health evaluation study (Jorgensen, Syme, Bishop & Nancarrow, 1999; Meyerhoff & Liebe, 2010). We cannot rule out that the observed effects are due to a biased monetary evaluation, but it seems unlikely. It has been shown before that the empirical pattern consistent with a prominence effect is not the result of a biased matching procedure (Slovic, 1975), and expert participants (in our Study 2) are experienced in both matching and choice. A second issue relates to interpretation. If one wants to make a cautious interpretation, one could argue that our results show the extent of the prominence effect but not its magnitude, since we cannot measure how far participants move away from their stated indifference points. A way to test this in future studies would be to ask participants how much greater the cost would need to be before the person reversed their preference for the low-risk option. Our prediction is that the magnitude in terms of increased costs would be substantial.

Comparison with other studies.   The prominence effect is a stable behavioral phenomenon that has been studied theoretically and empirically in the judgement and decision-making literature (Busemeyer & Johnson, 2004; Erlandsson et al., 2020; Erlandsson, 2021; Slovic, 1975; Sunstein, Kahneman, Schkade & Ritov, 2002; Tversky et al., 1988; Zhang & Slovic, 2019). It is also gaining traction as an explanation for the systematic failure of national governments to prevent humanitarian disasters in foreign countries (Slovic & Slovic, 2015). However, few studies before have formalized these arguments in the context of healthcare or demonstrated their empirical relevance among medical decision makers. The only exception is a study by Baron and Ubel (2001) that investigated preference reversals in cost-effectiveness rankings of different medical treatments. Their findings support the prominence effect as a mechanism behind people's desire to revise existing priority lists,

an explanation that is further strengthened by our results, not least since we found that the effect was quite strong also among people who actually make these types of decisions.

Conclusion and policy implications.   Any system that relies on public funding must decide how to best allocate its resources. In healthcare, many such allocation decisions ultimately lead to policies that carry life and death consequences, which makes it an area where emotion and reason often diverge. For example, many people find the practice of healthcare rationing hard to accept, even in the face of objective priority criteria that justifies rationing of one type of treatment in order to fund treatment of other diseases. The prominence effect builds on this tension between emotion and reason, predicting that decisions in healthcare will reflect a value for potential health improvements (funded by money) that is far lower than intended. This is clearly problematic, and it also means that the health system will suffer from inertia because policy makers will find it difficult to justify policies that appear to compromise prominent objectives, something that applies to almost any cost-containment policy in healthcare.

The disparity between prominent and secondary objectives in public debate depends on the extent to which detailed policy deliberations have been undertaken, and if they are accessible to the general public. The prominence effect is likely more pronounced when public debate revolves around vague principles such as "never compromise on the quality of care" or "everyone has a moral right to good care" without acknowledging the difficult tradeoffs that underlie every policy decision. This is not to say that such moral principles are wrong, they most certainly are not wrong as relevant considerations, but that they are likely to be disproportionally invoked against more nuanced arguments because they are easy to justify and defend. This results in an oversimplification of allocation problems that are inherently difficult but deserve more deliberation.

The prominence effect is a decision bias that operates at the level of the individual, but it is magnified at the level of policymaking since politicians and policy makers must justify their choices not only to themselves – but also to the general public. In this way the prominence effect is a plausible psychological mechanism behind the idea that opportunity costs are often imperfectly accounted for (neglected) in public policy decisions, because the spotlight often falls on options that were chosen, not options that were not chosen. Psychological research has stressed the use of structured decision-aiding processes to mitigate bias due to the prominence effect (Slovic, Västfjäll, Erlandsson & Gregory, 2017). The goal is to highlight key considerations and to make the pros and cons of different options more transparent, effectively forcing decision-makers to consider the opportunity costs of the different options at hand. Consequently, it becomes more difficult for policy makers and politicians to deal in absolutes and to justify hard choices with strict adherence to vague principles, because salient opportunity costs ultimately means that they must also justify what was *not* chosen.

References

Ahlert M., & Schwettmann L. (2017). Allocating health care resources: a questionnaire experiment on the predictive success of rules. *International Journal for Equity in Health, 16*(1), 112. http://dx.doi.org/10.1186/s12939-017-0611-1.

Alakeson, V. (2008). Why Oregon went wrong. *British Medical Journal, 337*, 900–901.

Baron, J., & Spranca, M. (1997). Protected Values. *Organizational Behavior and Human Decision Processes, 70*(1), 1–16. http://dx.doi.org/10.1006/obhd.1997.2690.

Baron, J., & Ubel, P. A. (2001). Revising a priority list based on cost-effectiveness: The role of the prominence effect and distorted utility judgments. *Medical Decision Making, 21*(4), 278–287. http://dx.doi.org/10.1177/02729890122062578.

Busemeyer, J. R., & Johnson, J. G. (2004). Computational models of decision making. In J. Koehler & N. Harvey (Eds.), *Blackwell handbook of judgment and decision making* (pp. 133–154). Hoboken, NJ: Wiley-Blackwell.

Erlandsson, A. (2021). Seven (weak and strong) helping effects systematically tested in separate evaluation, joint evaluation and forced choice. *Judgment and Decision Making, 16*(5), 1113–1154.

Erlandsson, A., Lindkvist, A., Lundqvist, K., Andersson, P. A., Dickert, S., Slovic, P., & Västfjäll, D. (2020). Moral preferences in helping dilemmas expressed by matching and forced choice. *Judgment and Decision Making, 15*(4), 452–475.

Everett, J. A., Pizarro, D. A., & Crockett, M. J. (2016). Inference of trustworthiness from intuitive moral judgments. *Journal of Experimental Social Psychology, 145*(6), 772–787. http://dx.doi.org/10.1037/xge0000165.

Everett, J. A. C., Faber, N. S., Savulescu, J., & Crockett, M. J. (2018). The costs of being consequentialist: Social inference from instrumental harm and impartial beneficence. *Journal of Experimental Social Psychology, 79*, 200–216. http://dx.doi.org/10.1016/j.jesp.2018.07.004.

Fiske, A. P., & Tetlock, P. E. (1997). Taboo trade-offs: Reactions to transactions that transgress the spheres of justice. *Political Psychology, 18*(2), 255–297.

Hadorn, D. C. (1991). Setting health care priorities in Oregon. Cost-effectiveness meets the rule of rescue. *JAMA, 265*(17), 2218–2225.

Jorgensen, B. S., Syme, G. J., Bishop, B. J., & Nancarrow, B. E. (1999). Protest responses in contingent valuation. *Environmental and Resource Economics, 14*(1), 131–150. http://dx.doi.org/10.1023/A:1008372522243.

Kahneman, D., & Frederick, S. (2005). A model of heuristic judgment In H. K. J. & R. G. Morrison (Eds.), *The Cambridge handbook of thinking and reasoning* (pp. 267–293). New York: Cambridge University Press.

Karelaia, N., & Hogarth, R. M. (2008). Determinants of linear judgment: A meta-analysis of lens model studies. *Psychological Bulletin, 134*(3), 404–426. http://dx.doi.org/10.1037/0033-2909.134.3.404.

Meyerhoff, J., & Liebe, U. (2010). Determinants of protest responses in environmental valuation: A meta-study. *Ecological Economics, 70*(2), 366–374. http://dx.doi.org/10.1016/j.ecolecon.2010.09.008.

Nord, E. (1999). *Cost-value analysis in health care: Making sense out of QALYs*. Cambridge: Cambridge University Press.

Persson, E., & Tinghög, G. (2020). Opportunity cost neglect in public policy. *Journal of Economic Behavior & Organization, 170*, 301–312. http://dx.doi.org/10.1016/j.jebo.2019.12.012.

Sabik, L. M., & Lie, R. K. (2008). Priority setting in health care: Lessons from the experiences of eight countries. *International Journal for Equity in Health, 7*(4), 1–13. http://dx.doi.org/10.1186/1475-9276-7-4.

Slovic, P. (1975). Choice between equally valued alternatives. *Journal of Experimental Psychology: Human Perception and Performance, 1*(3), 280–287. http://dx.doi.org/10.1037//0096-1523.1.3.280.

Slovic, P., Västfjäll, D., Erlandsson, A., & Gregory, R. (2017). Iconic photographs and the ebb and flow of empathic response to humanitarian disasters. *Proceedings of the National Academy of Sciences of the United States of America, 114*(4), 640–644. http://dx.doi.org/10.1073/pnas.1613977114.

Slovic, S., & Slovic, P. (2015). *Numbers and nerves: Information, emotions and meaning in a world of data*. Corvalis, OR: OSU Press.

Sunstein, C. R., Kahneman, D., Schkade, D., & Ritov, I. (2002). Predictably incoherent judgments. *Stanford Law Review, 54*(6), 1153–1215.

Tetlock, P. E. (2003). Thinking the unthinkable: Sacred values and taboo cognitions. *Trends in Cognitive Sciences, 7*(7), 320–324. http://dx.doi.org/10.1016/S1364-6613(03)00135-9.

Tinghög, G. (2011). The art of saying no: the economics and ethics of healthcare rationing (thesis). Linköping: Linköping University Press.

Tinghög, G. (2016). Health-care priority setting in practice: Seven unresolved problems. In E. Nagel & M. Lauerer (Eds.), *Prioritization in Medicine: An International Dialogue* (pp. 101-109). Cham, Switzerland: Springer International Publishing.

Tinghög, G. & Strand, L. (2022) Public attitudes toward priority setting principles in health care during COVID-19. *Frontiers in Health Services, 2*:886508. http://dx.doi.org/10.3389/frhs.2022.886508.

Tversky, A., Sattath, S., & Slovic, P. (1988). Contingent Weighting in Judgment and Choice. *Psychological Review, 95*(3), 371–384.

Ubel, P. A., Loewenstein, G., Scanlon, D., & Kamlet, M. (1996). Individual utilities are inconsistent with rationing choices: A partial explanation of why Oregon's cost-effectiveness list failed. *Medical Decision Making, 16*(2), 108–116.

Uhlmann, E. L., Zhu, L., & Tannenbaum, D. (2013). When it takes a bad person to do the right thing. *Cognition, 126*(2), 326–334. http://dx.doi.org/10.1016/j.cognition.2012.10.

005.

van Exel, J., Baker. R., Mason, H., Donaldson, C., & Brouwer, W. (2015) Public views on principles for health care priority setting: findings of a European cross-country study using Q methodology. *Social Science & Medicine, 126*, 128–137. http://dx.doi.org/10.1016/j.socscimed.2014.12.023.

Wiss, J., Levin, L. A., Andersson, D., & Tinghög, G. (2017). Prioritizing Rare Diseases: Psychological Effects Influencing Medical Decision Making. *Medical Decision Making, 37*(5), 567–576. http://dx.doi.org/10.1177/0272989X17691744.

Zhang, Y., & Slovic, P. (2019). Much ado about nothing: The zero effect in life-saving decisions. *Journal of Behavioral Decision Making, 32*(1), 30–37. http://dx.doi.org/10.1002/bdm.2089.