The general problem of prioritization

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Marko Kovic

About ZIPAR

The Zurich Institute of Public Affairs Research is devoted to identifying and addressing the major challenges for humankind in the short-term, in the medium-term, and in the long-term future. ZIPAR is an independent nonprofit think tank based in Zurich, Switzerland.

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Abstract

Resources in our decision-making are fundamentally limited. We cannot pursue all goals and we cannot pursue any subset of goals in all the ways they can be pursued. In other words: We have to engage in prioritization. This universal and basic need for prioritization is the general principle of prioritization. Real-world decision-making routinely violates the general principle of prioritization; this routine violation is the general problem of prioritization. The general problem of prioritization is caused by a number of factors, both on the individual micro- as well as on the more aggregate meso- and macro-levels. Given the importance of rational prioritization, reducing the general problem of prioritization, not least in the realm of policy-making, is a top priority.

Contents

1	Introduction: To do or not to do	5
1.1	The general problem of prioritization	5
1.2	Why the general problem of prioritization matters	6
2	Micro-level causes	7
2.1	Cognitive biases	8
2.2	Complexity	8
2.3	Socio-economic constraints	9
3	Meso- and macro-level causes	9
3.1	Organizational path-dependency	10
3.2	Low-quality public discourse	10
3.3	Special interest groups in politics	11
4	Reducing the general problem of prioritization	11
4.1	Tackling micro-level causes	11
4.2	Tackling meso- and macro-level causes	13
5	What meta-utility should we maximize?	14
6	Conclusion: Prioritization is a top priority	15
6.1	Prioritization and policy-making	15

1 Introduction: To do or not to do

Resources are limited. When we make decisions, we necessarily do so under this fundamental constraint: There is only so much time, manpower, money and so forth available to us for pursuing our goals. For example, if you had all the money in the world and if the only thing you wanted to do was to eat cake, you would be able to eat a lot of cake, but you would only be able to only eat some specific cake at some specific time. Furthermore, and perhaps more profoundly, you could only ever eat so much cake, because you cannot spend every second of your life eating cake, and, ultimately, your life will end at some point. This means that even when all the cake in the world is available to you in principle, practical resource limitations mean that you would be forced to make tough choices. In other words, you would have to engage in *prioritization* during your cake-eating endeavor.

Of course, this observation is somewhat trivial, because more or less every decision we make is contingent on limited resources. We know we cannot do everything, so we have to choose some things over other things. This basic fact of the need for prioritization in our decision-making can be described as a *general principle of prioritization*:

Given limited resources, it is impossible to pursue all potential goals, and it is impossible to pursue any subset of goals in all ways they can be pursued.

The general principle of prioritization describes two ways in which limited resources impact our decision-making. First, we cannot pursue all goals that we want to pursue. Second, we cannot pursue some subset of goals in all the ways that might be, in principle, possible. The difference between these two limitations can be illustrated with the above cake-eating example. In that example, even though our only goal is to eat cake (the number of goals in our subset of goals is exactly one), we are fundamentally limited in terms of when, how, and how much cake we can eat. This means that we will have to order our cake-eating preferences from best to worst and only realize those preferences that achieve our goal of eating cake as well as possible, given our limited resources.

1.1 The general problem of prioritization

The general principle of prioritization is something akin to a basic fact of life, a facet of the *conditio humana*. There is, perhaps, even beauty to be found in it: The fact that we have only so much time at our disposal means that we should prioritize wisely, lest we regret our choices when the end nears. However, the

general principle of prioritization also presents us with a big challenge: Actually taking it into account in our decision-making is neither easy nor something that we do very well. More specifically, in our day-to-day decision-making, we are very likely to encounter what can be described as the *general problem of prioritization*. This problem can be described in the following manner:

Either the direct violation of the general principle of prioritization by completely disregarding it (strong violation) or the failure to optimize for the general principle of prioritization (weak violation).

Even though we are usually at least peripherally aware of the general principle of prioritization, we often fail to take it into account in our decision-making. Actively violating the general principle of prioritization is a *strong* violation. A strong violation occurs when our decision-making is such that we completely ignore the general principle of prioritization and behave as if it didn't exist. Failing to optimize for the general principle of prioritization is a *weak* violation. A weak violation occurs when we intuitively account for the general principle of prioritization, but do so only partially and unsystematically.

Decision-making that does not violate the general principle of prioritization, neither strongly nor weakly, is *utility maximizing* decision-making. On a lower level, utility maximization means that we order preferences in such a way that we achieve some goal as well as possible. On a higher level, the choice of goals themselves can also take the form of utility maximization: If we want to maximize some utility in the world, we should choose goals that maximize that utility as well as possible, and then, we should try and achieve those goals as well as possible. If we go back to our cake-eating example, eating cake is the goal we have. From a utility maximization perspective, the overarching utility we wish to maximize could be the hedonic sensation that eating gives us. Eating cake, we decide, is the best way to maximize the hedonic sensation of eating. Another way of thinking about these two levels is in terms of meta-goals and instrumental goals. In order to achieve some meta goal (maximize the utility of the hedonic sensation of eating), we pursue instrumental goals (eating cake) the best we can (specific preferences for eating as much cake as possible).

Decision-making that does not violate the general principle of prioritization can be summarily described as decision-making in which our decisions are to be as *effective* as possible (or, expressed differently: to have as much impact as possible).

1.2 Why the general problem of prioritization matters

In many, possibly in most decision-making situations, the general problem of prioritization is probably not a tremendous problem. For example, when you are

deciding between a Pepsi and a Coca Cola, the outcome of that decision is not all that relevant either way. Often, however, the stakes of our decisions are much higher. There are three levels on which the general problem of prioritization can lead to bad outcomes.

The general problem of prioritization is a non-trivial problem in at least three ways. *First*, on a personal and subjective level, the failure to account for the general principle of prioritization means that we might not achieve or even identify the personal goals that we want to achieve, be they happiness, wealth, or anything else. Humans are motivated by setting and striving for goals [1], and goals that are more aligned with our intrinsic values and interests result in better goal attainment as well as in greater levels of wellbeing and happiness [2, 3].

Second, and at least as importantly, the general problem of prioritization means that we have difficulties deciding on goals and courses of action for achieving goals on a societal level. This is the basic experience of politics: Different policy-makers, stakeholders, and lobby groups pursue different kinds of goals and have different preferences, so that politics often revolves around finding compromise and bending to pressure, rather than prioritizing in a rational manner. Of course, it is unrealistic to expect perfect rational consensus in democratic policy-making [4], but the signal to noise ratio in democratic policy-making tends to be suboptimal, to the detriment of rational prioritization.

Third, and perhaps most importantly, the general problem of prioritization can have immensely negative consequences for future generations of humans. We currently live in what seems to be a period of accelerated technological development, and while the emerging technological innovations have the potential for drastically increasing the wellbeing of future generations, they are also creating new and immense risks. Consequently, the failure to adequately prioritize today in the context of global risk management can result in catastrophic outcomes for the future of humankind [5]. Likewise, adequate prioritization could lead to an enormous and desirable increase of the future wellbeing of humankind.

2 Micro-level causes

The general problem of prioritization can have many causes. For example, we often simply do not care all that much about the decision at hand. At lunchtime, you might feel hungry, but you do not really care about what you are about to eat as long as you are not hungry anymore. In some instances, however, the causes of the general problem of prioritization are more profound: Our *cognitive biases*, the *complexity* of decision-making situations, and *socio-economic constraints* on our decision-making capabilities.

2.1 Cognitive biases

A large part of our inference- and decision-making is not consciously rational, but rather fast and quasi-automated. In that cognitive mode, we rely on so-called cognitive heuristics; cognitive rules of thumb that usually allow us to arrive at conclusions that are good enough. Often, however, cognitive heuristics lead to undesirable outcomes. In such instances, heuristics are sometimes referred to as cognitive biases [6].

There are dozens of well-documented cognitive biases. When it comes to prioritization, many of them can have a negative impact. For example, one of the most prominent cognitive biases, the *status quo bias* [7], can negatively impact prioritization in that we have a tendency to not update our prioritization, but rather to continue pursuing existing goals and preference orders, despite good reasons to update. This tendency can be compounded by the *confirmation bias* [8] and by the sunk cost fallacy [9], two prominent biases that lead us to having a tendency of confirming what we already believe and feeling a sense of investment towards our existing beliefs that motivates us to not update them, even in the face of good reasons. Another important bias in the context of prioritization is the *present bias* [10]: We prefer things in the present rather than in the future, even if the utility is much greater in the future than in the present. Consequently, we are collectively rather bad at planning into the medium-term and long-term future.

The list of cognitive biases that contribute to the general problem of prioritization could go on for many more paragraphs. The main point about cognitive biases in this context is that even when we might believe that we are engaging in more or less rational prioritization, the flaws that are «baked into» our cognition can result in irrational prioritization.

2.2 Complexity

Reality is complex – too complex, in fact, for our minds to fully make sense of it. Collectively, humankind has made great strides in understanding reality, not least thanks to the scientific enterprise and its underpinning of methodological reductionism, but any given person cannot fully comprehend reality at any given time. That is, of course, a profoundly basic experience of human life.

In the context of prioritization, complexity can become a problem in at least two ways. *First*, if we have to make a decision and want to take the general principle of prioritization into account, we might quickly feel overwhelmed and default into a position of defeatism and resignation. Rationally prioritizing goals and preferences, we might feel, is so massively complex that we simply shrug and wonder: Why even try? *Second*, engaging with complexity in our decision-making

could in some instances be counterproductive if we need to allocate an inordinate amount of resources into one singular decision – resources that might be missing for some other, perhaps more important decision-making situation.

2.3 Socio-economic constraints

The notion that we should avoid the general problem of prioritization is probably universally acceptable; no one would object to as rational prioritization as possible. In practice, however, the capabilities and freedoms to actually engage in rational prioritization are unequally distributed. In general, we are never truly completely free from external constraints, since we are always embedded in the complexities of our individual biography. Every human is on some life path that is marked by a multitude of parameters; gender, health, place of birth, family wealth, and so forth. Some people enjoy a combination of parameters (such as relative wealth and health) that provide them the liberty to engage in intellectual exploration and self-actualization. Many other people, however, have far fewer liberties to do so. More specifically: The lower a person's socio-economic status, the fewer the liberties to engage in rational prioritization.

The reason for this is simple and rather obvious. If you are poor and have to expend a lot of resources simply to secure basic necessities such as food and shelter, your overall needs will tend more towards physiological and safety needs rather than to lofty needs such as self-actualization [11]. If you ask a starving person what goal is more important, having dinner or making sure that we mitigate the risks of space colonization, the starving person will rightfully prioritize dinner over risk mitigation of space colonization. Wanting the starving person to disregard their immediate physiological need in favor of some long-term future utility is immoral under any reasonable set of assumptions.

The effects of socio-economic constraints do not materialize only in extreme cases. In Western societies, many people enjoy great liberties for intellectual self-actualization, but empirically, our individual prioritizations are still heavily contingent on our individual biographical realities. Even people who enjoy relatively high levels of intellectual liberty are mostly path-dependent in their lives, in that they conform to external incentives and stimuli (for example, we usually want to conform to social norms [12]) as well as to internalized routines (we are mostly risk-averse and prefer to keep doing what we are doing).

3 Meso- and macro-level causes

The primary origin of the general problem of prioritization lies in the micro-level: Individual people make decisions, and in doing so often violate the general princi-

ple of prioritization. There are, however, some additional dynamics and problems on the meso- and macro-level of human decision-making that exacerbate the general problem of prioritization: *Path-dependency*, *low-quality public discourse*, and *special interest groups*.

3.1 Organizational path-dependency

If you had to guess what the decisions of decision-makers in some private or nonprofit organization or the decisions of policymakers in governmental contexts will look like in the short-term future, it would probably be a safe bet to say that their decisions will not deviate from the status quo too much. Meso- and macro-level decision-making or activity is very *path-dependent*. Policies and courses of action tend not to stray too far from the status quo, and they represent mostly small and incremental changes. The path dependency of organizations can be thought in terms of a feast or famine or a punctuated equilibrium metaphor [13]. Of course, the fact that organizational behavior is path-dependent comes as no surprise. For example, when organizational activity becomes routine and repetitive, it can also become more efficient and less error-prone, which is generally beneficial for any organization. However, organizational path-dependence also means that active prioritization efforts can be very difficult, because there is often no stimulus for overcoming the status quo from within and it can take a lot of resources to stimulate prioritization activity from without.

3.2 Low-quality public discourse

A general prerequisite for individual as well as organizational and societal prioritization is *information*: We need enough (in the sense of volume) and good enough (in the sense of quality) information so that our prioritization efforts can actually be fruitful. From an individual point of view, the need for information means that we need to seek out or be exposed to new information periodically, and the epistemic quality of that information should be as great as possible. For example, if someone who has no particular knowledge of geography and astronomy gets exposed to flat Earth conspiracy theories, then that information could ultimately result in epistemic damage (the person might adopt false beliefs) and consequently in a deterioration of that person's prioritization.

One of the most important (metaphorical) places where people access information about the world is what is sometimes described as the *public sphere* [14], a loose network of public communication in which, ideally, rational discourse produces reliable and accurate information. Even more than that: Rational public discourse is, ideally, in and of itself a macro-level prioritization effort. Unfortunately, public discourse is never as rational as we would ideally like it to be,

and it can often do epistemic damage rather than provide a reliable baseline of information, especially now in the age of fragmented public discourse (It is trivially easy today to only seek out those sources of information that confirm the beliefs we already hold, so that we can essentially stop updating our beliefs and stagnate *ad infinitum*).

3.3 Special interest groups in politics

Ideally, politics would be an exercise in perfect prioritization, and the needs and problems of all people in a polity (such as a country) would be effectively and justly addressed. In reality, politics and policy-making is heavily influenced by special interest groups: Concerted efforts by relatively small but wealthy groups heavily shape policy in democratic systems, and the goals and preferences of special interest groups are usually different from the goals and preferences of the general population [15, 16, 17, 18].

The participation of special interest groups in politics and policy-making is not categorically negative from a prioritization perspective. For example, democratic corporatism in countries such as Switzerland historically meant that different and opposing interest groups actively came together in order to find common ground and shape pragmatic policy [19], thereby potentially creating well-balanced priorities. However, modern special interest groups often do not aim to promote goals and preferences to the benefit of general prioritization and problem-solving, but rather to the particularistic benefit of some small subset of people and organizations. In doing so, special interest groups do not violate the general principle of prioritization from their own point of view. Quite the opposite: They are often highly effective in reaching their goals. The general problem of prioritization that occurs through special interest influence is present from the point of view of higher-order reference groups such as the general population in a democratic country. In other words, when special interest groups successfully shape policy to their own benefit, the policy-making has failed to optimize for the general principle of prioritization from the point of view of the general population.

4 Reducing the general problem of prioritization

4.1 Tackling micro-level causes

Ideally, we would completely eliminate the general problem of prioritization from our decision-making, but that is unrealistic, given that the causes for the problem are fairly complex. We can, however, try to reduce the prevalence of the general

problem of prioritization. Investing cognitive and other resources for doing so is worth it: Reducing the prevalence of the general problem of prioritization means that we can tremendously improve our most important decisions – those that affect future generations of humankind. So instead of simply doing as much as possible (as we sometimes desire), it might be a tremendously good investment to perhaps do a little less, but to carefully consider what it is that we want and should be doing. Unfortunately, there is no quick and easy solution to the general problem of prioritization, but we can try to address its main causes.

Cognitive biases are a universal trait of human cognition, and so far, there is no easy fix for them – biases are not a byproduct of our cognition, but the very modus operandi of our brain. We can, however, engage in active debiasing in order to try to reduce the impact of our biases. More specifically, debiasing can take the form of cognitive forcing whereby we try and engage in metacognition (thinking about our thinking) in select decision-making situations [20, 21]. This can either happen directly by questioning our judgement or indirectly by applying debiasing tools such as considering the opposite of what we believe and decide [22] or, more generally, actively considering alternative inferences and decisions [23].

Dealing with *complexity* is more difficult than dealing with cognitive biases. Biases are a trait of our brain, whereas complexity is a trait of the world outside our brains. There is no obvious way to reduce the complexity of reality. Instead of trying to reduce complexity, we can adapt our decision-making by employing what can be called *rational satisficing*. Satisficing is a decision-making strategy that we often intuitively engage in: Instead of trying to achieve some goal as well as possible, we are often satisfied with making a decision that is sufficiently good to reach some threshold [24]. Satisficing is a very useful heuristic, but it can also be a bias when it prevents us from making decisions that are potentially much more effective. *Rational* satisficing could avoid the pitfalls of satisficing by being actively aware of the fact that we are merely using a heuristic and, more importantly, by an active willingness to update our beliefs and change our preferences and goals if need be. In other words, rational satisficing can allow us to make decisions that are good enough, while at the same time avoiding falling into the trap of our cognitive biases. By constantly applying satisficing in our decision-making, we approach rational utility maximizing behavior in the long run.

Socio-economic constraints might be the most difficult of the causes of the general problem of prioritization to mitigate. Dealing with cognitive biases and with complexity can be done on an individual level; as individual people, we can take steps to suffer less from biases and to avoid being overwhelmed by complexity. Socio-economic constraints, on the other hand, are much more difficult to get rid of. If you are working in a low-paying job in order to pay the bills, you do not have the

luxury to just abandon that job and pursue some other professional venue because you decided to prioritize some things differently. In other words, socio-economic constraints are factors heavily influenced, if not determined by the outside world. One general measure that could provide people with the freedom to engage in prioritization is the *universal basic income*. The basic income is an unconditional income that, for example, all residents within a country receive, with not strings attached. So far, the basic income has not been implemented anywhere on a large scale, but such a measure has the potential to drastically reduce poverty and to provide a layer of material security that creates the breathing room for endeavors such as prioritization [25].

4.2 Tackling meso- and macro-level causes

Dealing with the meso- and macro-level causes of the general problem of prioritization is more difficult than dealing with the micro-level causes. Meso- and macro-level causes are more complex in nature and countermeasures are accordingly more difficult to devise and implement. Nonetheless, there are some general directions and courses of action that can be considered.

Path-dependency in organizations is very difficult to address, not least because being path-dependent is not necessarily negative for an organization. One potential way to stimulate organizations away from path dependency is to *work with decision-makers within organizations*. For example, debiasing techniques such as the famous veil of ignorance [26] could help decision-makers within organizations to think outside of the proverbial box. Another possible approach to reducing the negative impact of path-dependency would be to create conditions that *increase the probability of the creation of new organizations*. For example, better prioritization in the private sector might be better achieved through the emergence of new small companies rather than through reforms of old and big ones, and entrepreneurial activity can be actively stimulated through appropriate policy. Reducing path-dependency in the *public sector* is possibly more difficult, because long decision-making chains with multiple (political as well as bureaucratic) veto points is a typical trait of public sector organizations and institutions. However, the right kinds of stimuli introduced at high-impact decision-making points (such as parliaments) can reverberate effectively through public sector organizations.

Improving the quality of *public discourse* is a goal that is probably as old as democracy itself. In our current modern setting, a general meta-strategy for increasing the quality of public discourse might be policy aimed at improving and strengthening *mass media*. Strong freedom of the press, a combination of private and public media organizations, and a combination of different media types (online, newspapers, television, radio, and so forth) are generally conducive to rational public discourse. Measures that limit access to low-quality information

(especially on the Internet), on the other hand, should be avoided, because any form of censorship means opening a problematic can of worms, no matter how benevolent the censorship in question is. Instead, actively increasing *media literacy* could be both more justifiable and more effective. Systematically teaching critical thinking skills in public schools, for example, would serve as a universal tool for discerning credible from unreliable information.

Special interest groups are a trait of democratic policy-making that cannot be excised under any set of reasonable assumptions, but it is possible to reduce their negative impact. One general way of doing so is to *beat special interest groups at their own game*. A special interest group aimed at reducing the negative impact of other special interest groups could conceivably have impact; be it through directly attacking other interest groups and their lobbying work or through indirectly working against interest groups by actively assisting policy-makers in rational prioritization.

5 What meta-utility should we maximize?

The general principle of prioritization is, as argued above, almost trivial, and the recognition of the general problem of prioritization is, accordingly, hardly controversial. Yet there is one aspect of the general problem of prioritization that is problematic: If the idea of the general principle of prioritization is to engage in utility-maximizing behavior in which we want to, ultimately, maximize some meta-utility, then what should that meta-utility be?

There is no objective or impartial criterion for prioritizing among meta-utilities. In the example further above, the meta-utility that you are pursuing is the hedonic sensation of eating, and to that end, you pursue the goal of eating cake, and you order your preferences for eating cake in such a way that you eat as much cake as possible. Even though that meta-utility is, from a purely objective point of view, just as valid as any other, most people would probably intuitively argue that there are more important meta-utilities to maximize. Is there a rational way for deciding which meta-utilities matter more than others?

One possible approach for determining the most desirable meta-utility is to apply concepts and principles from *moral philosophy*. For example, a general meta-utility prioritization strategy can be that of *negative utilitarianism*. Utilitarianism is the moral argument that an action can be considered morally good when it increases happiness as much as possible for as many beings as possible [27]. Negative utilitarianism is a variant of the utilitarian argument. It states that the moral imperative lies not in increasing happiness, but in reducing suffering, because suffering is more undesirable than happiness is desirable [28, 29].

Another potential approach for meta-utility prioritization is *risk mitigation*.

From such an approach, the meta-utility that we should strive to maximize is the reduction of risk, in the sense of reducing as much risks that are as great as possible. One consequence of a risk-mitigating approach is that the reduction of existential risks [30] (risks that endanger all of humankind) becomes a high priority.

The meta-utility that we want to maximize at ZIPAR is a combination of large-scale (negative) utilitarianism and risk mitigation. Our goal is to maximize the future wellbeing of humankind by addressing major challenges and risks that have the potential for (catastrophically) negative impact on humankind's future wellbeing [31]. That meta-utility is not objectively preferable to any other meta-utility, but it is, we believe, sufficiently justifiable so as to merit a high-priority status.

6 Conclusion: Prioritization is a top priority

We all have the natural urge to do things, and to do as many things as possible as quickly as possible. Taking time to carefully think about what we want to do can be difficult, a little bit annoying, and perhaps even somewhat daunting – after all, thinking about and actively engaging in prioritization might lead us to the conclusion that the goals we are currently pursuing and the ways in which we are pursuing them are not optimal. Yet prioritization is enormously important, and investing cognitive and other resources into prioritization is accordingly almost certainly always beneficial. Ultimately, it's not about doing as much as possible, but about doing the right thing.

6.1 Prioritization and policy-making

The domain in which the consequences of the general problem of prioritization are probably most dire is policy-making. Policy-making is essentially a large-scale prioritization effort: Policymakers are fully aware that resources are limited, and the allocation of limited resources is inevitably an exercise in prioritization. Given the universal importance of policy-making, reducing the general problem of prioritization within policy-making could have tremendous positive impact. In order to reduce the general problem of prioritization in policy-making, challenges both on the micro- (policymakers suffer from biases, have trouble managing complexity, and live within socio-economic constraints just as anybody else) and the meso-/macro-level (policy-making is path-dependent, it is affected by less-than-great public discourse, and special interest groups have a lot of influence) need to be addressed. This makes improving prioritization in the policy-making realm exquisitely difficult. However, given how immensely beneficial improvements to

prioritization in policy-making can be, almost any amount of effort necessary to bring about those improvements seems justified.

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