

A characterization of the one-sidedness fallacy within the framework of the cognitive distortions

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Abstract

In this paper, I propose an accurate description of the cognitive process involved in the one-sidedness fallacy, a widespread type of fallacy. I describe first several characterizations of the one-sidedness fallacy, that are either inductive or deductive, or occurring at a meta-philosophical level. I recall, second, the framework of the cognitive distortions described in Franceschi (2007). I give then a definition of the one-sidedness fallacy, by describing it as a general cognitive distortion: the disqualification of one pole. I show finally how the one-sidedness fallacy distinguishes itself from the confirmation bias.

Keywords: one-sidedness fallacy, cognitive distortion, confirmation bias

The one-sidedness fallacy (OSF, for short) is a very common type of fallacious reasoning. Despite its ubiquitous nature, it appears however that the cognitive process involved in the OSF lacks a precise characterization. In addition, it appears that this fallacy relates to several fields, among which one can mention, without pretending to exhaustiveness: logic, cognitive psychology and philosophy. The purpose of the present paper is to propose a novel definition of the one-sidedness fallacy, which is best suited to its interdisciplinary nature, i.e. is capable of situating the OSF with regard to the cognitive distortions and the confirmation bias.

Several attempts at characterizing the OSF can be found in the literature. A characterization of this type of fallacious reasoning is notably provided by Peter Suber (1998). In addition, some authors give a significantly different presentation from that of Suber, by assimilating the OSF to the confirmation bias. Lastly, some other authors present this fallacy like an argument which results in mentioning only the advantages of a given object or situation, by occulting completely the corresponding disadvantages. It appears thus that several problems arise with regard to the OSF. It proves, first, that the characterization of the OSF is not always very clear and that one observes thus some variations, in its mere definition, according to authors. It appears, second, that one lacks a precise definition of the relationships between the OSF and the confirmation bias. In what follows, I shall proceed to describe accurately the OSF, by replacing it within the conceptual framework of the general cognitive distortions described in Franceschi (2007). I will also underline its specific relationships with the confirmation bias.

1. The one-sidedness fallacy

To begin with, Peter Suber (1998) describes the OSF as a fallacious reasoning which consists in presenting only one aspect of the elements which justify a given judgment or viewpoint, by completely occulting the other aspect of the relevant elements relative to this same judgment :

The fallacy consists in persuading readers, and perhaps ourselves, that we have said enough to tilt the scale of evidence and therefore enough to justify a judgment. If we have been one-sided, though, then we haven't yet said enough to justify a judgment. The arguments on the other side may be stronger than our own. We won't know until we examine them.

The error of reasoning consists thus in taking into account only one viewpoint concerning the judgment in question, while at the same time the other point of view could prove decisive as for the conclusion to be drawn. Suber's description justifies the denomination which he gives to this type of fallacious reasoning: the *one-sidedness* fallacy. It is worth mentioning here that a general description of this type of error of reasoning had already been formulated, in nearby terms, by John Stuart Mill (*One Liberty*, II):

He who knows only his own side of the case, knows little of that. His reasons may be good, and no one may have been able to refute them. But if he is equally unable to refute the reasons on the opposite side; if he does not so much know what they are, he has no ground for preferring either opinion.

Suber in addition undertakes to give a precise characterization of the OSF and underlines several of its specific elements:

The one-sidedness fallacy does not make an argument invalid. It may not even make the argument unsound. (...)

So the one-sidedness fallacy doesn't mean that your premises are false or irrelevant, only that they are incomplete. You may have appealed only to relevant considerations, but you haven't yet appealed to all relevant considerations.

Some logicians say that an argument is cogent if it is valid and sound and takes all relevant considerations into account. On this usage, one-sidedness does not undermine validity or soundness, but cogency.

Suber observes thus that the OSF could constitute a valid argument. For its conclusion could be true if its premises were true. Moreover, notices Suber, it appears that the argument could not only be valid but quite *sound*. In effect, it proves that the premises of the argument could be true. And consequently, the conclusion of the argument could be legitimately inferred from its premises. However, as Suber points it out, the flaw in the argument resides in the fact that a certain number of premises are missing. And had the premises been present, the conclusion of the argument could have been radically different.

Given what precedes, we are in a position to formulate a general definition of the OSF. It consists then of considering a given object *o* by focusing on a given viewpoint A, while ignoring the opposite viewpoint \bar{A} , which is however also relevant. In order to provide a precise characterization of the OSF, it proves to be necessary to describe somewhat more formally its internal structure. As we shall see later, the fallacy is polymorphic and I will describe in what follows a *deductive* and an *inductive* form as well as an application of the fallacy at a *meta-philosophical* level.

1.1 Deductive one-sidedness fallacy

To begin with, it is worth considering the deductive form of the OSF. To this end, let us consider an instance, which consists of the following reasoning, mentioned by Philippe Boulanger (2000)¹, who attributes it to mathematician Stanislas Ulam. Ulam estimates that if the company had a significant manpower, its operation would be paralyzed by the inherently great number of internal conflicts. He estimates then that the number of interpersonal conflicts would increase according to the square of the number *n* of employees, whereas the work that will result from it will only progress in function of *n*. Hence, the argument goes, it is not desirable that a company's manpower reaches a significant size. However, it appears that Ulam's argument is fallacious, as Boulanger underlines it, because it exclusively stresses on conflicts within interpersonal relationships. However, the n^2 relations within the company can consist of conflicts, but also of profitable collaborations as well. And there is no reason then to privilege the conflicting relationships over the collaborative ones. And when among the n^2 relations established in the company, some of them are genuine relations of collaboration, it has by contrast the effect of improving the company's efficiency. Hence, one cannot conclude legitimately that it is not desirable that a company's manpower reaches a significant size.

For the sake of clarity, it is worth formalizing the above reasoning. It appears then that Ulam's reasoning can be stated as follows:

- (1d) if <a company has a significant manpower>
- (2d) then <there will be n^2 conflicting relations>
- (3d) then bad effects would result from it

¹ In personal correspondence, Philippe Boulanger mentions that he heard Stanislas Ulam develop this point during a conference at the University of Colorado.

(4d) therefore, the fact that a <a company has a significant manpower> is bad

This reasoning, however, is fallacious, for it only focuses on conflicting relationships, and overlooks a parallel argument with the same structure that could be raised, by emphasizing collaborative relationships, which is the other side of the relevant criteria to this issue. The parallel argument goes as follows:

- (1d*) if <a company has a significant manpower>
- (2d*) then <there will be n^2 collaborative relations>
- (3d*) then good effects would result from it
- (4d*) therefore, the fact that <a company has a significant manpower> is good

This casts light on the fact that both formulations of the argument raise contradictory conclusions, namely (4d) and (4d*). At this step, it is worth highlighting the basic structure of the above reasoning, which can be formalized as follows:

(5d) situation s is bad from viewpoint A

while the parallel reasoning is:

(5d*) situation s is good from viewpoint \bar{A}

1.2 Inductive one-sidedness fallacy

It is worth considering, second, the inductive form of the OSF. Let us consider that the conclusion of the OSF corresponds to a given generalization H . The argument underlying the OSF presents then the following form:

(1) $H_1, H_3, H_4, H_8, H_{11}, H_{12}, \dots, H_{100}, \therefore H$

where $H_1, H_2, H_3, \dots, H_{100}$ denote the premises and H the conclusion. Such a structure, as we can see, is that of an inductive enumeration. To fix ideas, one can consider the following form, where o denotes a given type of object and U a given property of this object:

(2) $U_{o_1}, U_{o_3}, U_{o_4}, U_{o_8}, U_{o_{11}}, U_{o_{12}}, \dots, U_{o_{100}}, \therefore U_o$

This renders apparent the flaw in the reasoning inherent to the OSF. It proves thus that those instances which have the opposite property \bar{U} are not taken into account. Consequently, the reconstituted correct reasoning should have been the following:

(3) $U_{o_1}, \bar{U}_{o_2}, U_{o_3}, U_{o_4}, \bar{U}_{o_5}, \bar{U}_{o_6}, \bar{U}_{o_7}, U_{o_8}, \bar{U}_{o_9}, \bar{U}_{o_{10}}, U_{o_{11}}, U_{o_{12}}, \dots, U_{o_{100}}$

But in this case, as we can see, an essential difference with the OSF ensues: the initial conclusion, i.e. $\therefore U_o$, does not follow.

1.3 The one-sidedness fallacy at a meta-philosophical level

At this step, it is also worth mentioning that the OSF is susceptible of being encountered at a meta-philosophical level. For some instances of the OSF can be observed, for example, in paradox analysis. It could be argued that some philosophical paradoxes could be solved with two-sided analysis. For some paradoxes admit of two variations, that are fundamentally different in essence, and lead therefore to intrinsically different solutions. In comparison, some classical solutions to these paradoxes appear to be one-sided, since they only focus on one variation of the corresponding paradox.

To give an example, let us consider the surprise examination paradox. From a meta-philosophical viewpoint, the analysis developed in Franceschi (2005) can be seen as a two-sided analysis of the paradox. It leads to distinguish between a version of the paradox corresponding to a conjoint structure, which is associated with a discrete notion of surprise, and on the other hand, a disjoint version of the paradox, which

is related to a vague notion of surprise. Each version of the paradox is different in essence and admits of an independent resolution. Roughly speaking, Quine's solution (1953) to the surprise examination paradox and Hall's reduction (1999) apply straightforwardly to the former variation of the paradox. In contrast, the version of the paradox which is associated with a disjoint version of the paradox and a *vague* notion of surprise, bears on some insights provided by Timothy Williamson (2000), Paul Dietl (1973) and Smith (1984). In this context, some classical solutions to the surprise examination paradox, such as Quine's (1953), which apply to the variation of the paradox associated with the conjoint structure of the paradox and the *discrete* notion of surprise, can be construed as an OSF, at a meta-philosophical level. In effect, Quine's analysis, though partly successful at solving the surprise examination paradox, can be considered as a meta-philosophical instance of the OSF, when it claims to resolve the paradox in full generality, since it only focuses on the *discrete* side of the surprise notion. Conversely, those solutions to the surprise examination paradox which only address the version of the paradox related to the disjoint structure and the vague notion of surprise, such as the solutions proposed by Dietl (1973) and Smith (1984), can also be seen as one-sided at a meta-philosophical level, for they only focus on the *vague* side of the surprise notion.

Another example of a two-sided analysis of a paradox is notably provided by David Chalmers (2002, p. 157), in his account of the two-envelope paradox. Chalmers draws then a distinction between two types of situations, according to whether the amount in the envelopes is finite or infinite. He offers then a differential diagnosis of the two-envelope paradox in these two cases.

2. The framework of cognitive distortions

It is worth presenting here the main elements of the framework of general cognitive distortions described in Franceschi (2007). This theoretical framework is intended to allow for a description of the cognitive distortions, introduced by Aaron Beck (1963, 1964) and Albert Ellis (1962) in the context of cognitive therapy of some mental disorders. The cognitive distortions are classically defined as fallacious reasoning that play a dominating role in the emergence of certain mental disorders. The cognitive therapy is based in particular on the identification of these cognitive distortions in the usual reasoning of the patient, and their replacement by alternative reasoning. Classically, the cognitive distortions are described as one of the twelve following modes of irrational reasoning: 1. Emotional reasoning 2. Hyper-generalization 3. Arbitrary inference 4. Dichotomous or all-or-nothing thinking 5. Should statements (Ellis 1962) 6. Divination or mental reading 7. Selective abstraction 8. Disqualifying the positive 9. Maximization and minimization 10. Catastrophism 11. Personalization 12. Labeling.

The cognitive distortions can be built, in the model described in Franceschi (2007), from three basic concepts: the *reference class*, the *duality* and the *system of taxa*. The reference class, to begin with, consists of a set of phenomena or objects. In the context of cognitive therapy, several examples can be mentioned: the class made up of the events and the facts of the patient's life; the class of the future events of the patient's life; the reference class consisting of the set of the parts of the patient's body; the class made up of the character traits of the patient, etc. In a more general context, which applies specifically to the description of the OSF, we shall retain a reference class which identifies itself with a class of objects (whether abstract or concrete) or events.

On the other hand, the concept of duality corresponds to a pair of dual concepts. Among these latter, one can mention (without pretending to exhaustiveness): Positive/Negative, Internal/External, Quantitative/Qualitative, Visible/Invisible, Analytic/Synthetic, Absolute/Relative, Abstract/Concrete, Static/Dynamic, Unique/Multiple, Aesthetic/Practical, Precise/Vague, Finite/Infinite, Advantage/Inconvenient, Simple/Compound, Individual/Collective, Implicit/Explicit, Voluntary/Involuntary, etc. A duality corresponds then to a criterion under the angle of which the elements of the reference class can be apprehended or evaluated. One can denote by A/\bar{A} a given duality, where A and \bar{A} are dual concepts.

Lastly, the system of taxa of the subject consists of a taxonomy which makes it possible to the latter to evaluate and classify the elements of the reference class, according to a criterion which is that of a given duality A/\bar{A} . The taxa can be considered as what the subject 'can see'. One can regard them as a system of values which is inherent to him/her or a filter through which the subject 'sees' the elements of the reference class, i.e. the phenomena or the objects of the reality. The Fig. 1 below represents an optimal system of taxa:

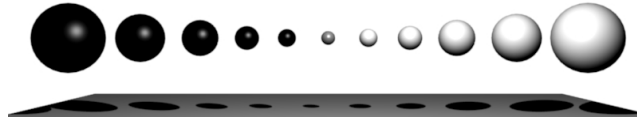


Fig.1. The optimal system of taxa

This optimal system of taxa is composed of 11 spheres which represent each a given taxon of a duality A/\bar{A} . The system of taxa is optimal, because all taxa are present. On the other hand, if the subject lacks some taxa, he/she cannot see nor count the corresponding elements. Thus, if he/she does not have the taxa of duality A/\bar{A} corresponding to pole A, he/she cannot see the corresponding elements. In a similar way, if the subject lacks the neutral taxon, he/she cannot see the neutral elements of the reference class. Formally, let us consider thus a series of n elements E_1, E_2, \dots, E_n such that each of them has objectively a degree $d[E_i]$ within duality A/\bar{A} , ranging between -1 and 1 ($d \in [-1, +1]$). One can consider thus a series comprising 11 elements, E_1, E_2, \dots, E_{11} , which present an increasing objective degree (the choice of 11 elements is arbitrary here, and any other number would also be appropriate). One can pose as follows: $d[E_1] = -1, d[E_2] = -4/5, d[E_3] = -3/5, d[E_4] = -2/5, d[E_5] = -1/5, d[E_6] = 0, d[E_7] = 1/5, d[E_8] = 2/5, d[E_9] = 3/5, d[E_{10}] = 4/5, d[E_{11}] = 1$. In the same way, one can define a subjective degree $\Delta[E_i]$ such as it is attributed by the subject to each of the E_i . Thus, E_1 - E_5 correspond to pole A of duality A/\bar{A} , E_6 to the neutral taxon and E_7 - E_{11} to the pole \bar{A} .

3. Characterizing the one-sidedness fallacy

At this stage, we are in a position to give a definition of the OSF within the framework which has just been described. For this purpose, it is worth considering first the *disqualification of the positive*. It consists of one of the twelve cognitive distortions classically defined, under the terms of which the patient tends to be unaware of and ignore the positive events, by considering that they do not count, for such or such reason. In such a context, the negative events are occulted and are not taken into account within the patient's reasoning. The disqualification of the positive can be analyzed thus like an instance of a general cognitive distortion, the disqualification of one pole, which applies to the Positive/Negative duality and to the reference class including the facts and events of the patient's life.

The disqualification of the positive, as we did see it, constitutes thus an instance of the *disqualification of one pole*. This latter, within the framework defined in Franceschi (2007), constitutes a general cognitive distortion which results in granting (intentionally or not) an arbitrary preference to one of the poles of a given duality A/\bar{A} , in order to qualify the elements of a reference class, with the resulting truncated system of taxa.

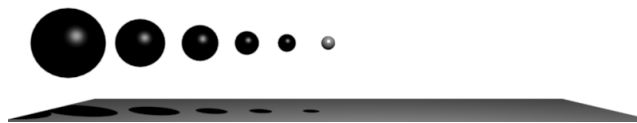


Fig.2. The disqualification of one pole

It consists then of attributing more importance to one of pole than to the other, in the lack of objective motivation. The subject ignores then the taxa corresponding to one pole of a given duality A/\bar{A} and does only see things through the prism of pole A (respectively \bar{A}), by completely ignoring the point of view of the opposite pole \bar{A} (respectively A). As we can see, it proves that the omission of one pole thus defined assimilates itself with the OSF, since it applies to whatever duality.

At this step, it is worth mentioning that some authors describe the OSF as an error of reasoning which consists in presenting only the advantages of a given object or situation, by occulting completely the corresponding disadvantages. Such a definition appears however restrictive with regard to the general form which has just been described, since it proves to be limited to the Advantage/Inconvenient duality. In the present context, such conception of the OSF rather assimilates itself to a specific instance of the

disqualification of one pole, that applies to the Advantage/Inconvenient duality. In contrast, the OSF appears to be more general in the present context, since it applies to whatever duality.

4. The one-sidedness fallacy and the confirmation bias

Taking into account what precedes, it is also worth distinguishing the OSF from the confirmation bias. Some authors, as we did see it, assimilate these two types of fallacious reasoning one to the other. The confirmation bias (Nickerson 1998) is in effect an error of reasoning which consists of only taking into account the instances which confirm a given generalization, without considering the instances which disconfirm it. This highlights how the confirmation bias takes place at a stage where a generalization H is already formed, as formerly noticed by Francis Bacon (1620/1939):

The human understanding when it has once adopted an opinion (either as being the received opinion or as being agreeable to itself) draws all things else to support and agree with it. And though there be a greater number and weight of instances to be found on the other side, yet these it either neglects and despises, or else by some distinction sets aside and rejects;

It appears useful, in this context, to distinguish between the process of *formation* of a generalization, and of its *maintenance*. For it appears then clearly that the confirmation bias emerges only at the stage of the maintenance of a given generalization H. On the other hand, the OSF is likely to appear at the time of both the formation or of the maintenance of this generalization. One can thus formalize as follows the type of reasoning which results from the confirmation bias:

- | | | |
|-----|---|-----------------------------------|
| (4) | $H_1, H_3, H_4, H_8, H_{11}, H_{12}, \dots, H_{100}, \therefore H$ | formation of the generalization H |
| (5) | H_{101} | new instance |
| (6) | $H_1, H_3, H_4, H_8, H_{11}, H_{12}, \dots, H_{100}, H_{101}, \therefore H$ | confirmation of H |

Under these conditions, the confirmation bias appears well as a form of the disqualification of one pole the scope of which is limited to inductive reasoning and to the stage of maintenance of a given generalization. On the other hand, the scope of the OSF appears broader, for it can manifest itself deductively or inductively. In addition, when it manifests itself inductively, the OSF can apply indifferently at the stage of the formation or of the maintenance of a given generalization.

As we did see it, the OSF can be assimilated with the omission of one pole such as it is defined within the framework described in Franceschi (2007). This also makes it possible to distinguish the OSF from the restrictive conception of it which limits its scope to the Advantage/Inconvenient duality. Lastly, the description of the OSF which has been just given also makes it possible to accurately describe its relationships with the confirmation bias.

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