Are Fallacies Frequent?

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Abstract: This paper provides methodological tools and considers the reasons why it is difficult to address the controversial question, "Are fallacies frequent?" After preliminary remarks on the need to clarify the meaning of both 'fallacy' and 'frequency,' this paper shows that the emphasis on whether fallacies occur frequently is recent and bound to contemporary definitions that make it a necessary condition. Then, it discusses three different, debated empirical approaches that are intended to support the claim that fallacies are frequent. All of them raise doubts or objections or are even controversial from a methodological point of view. Ultimately, more empirical research is needed to answer this question.

Résumé: Cet article fournit des outils méthodologiques et envisage les raisons rendant difficile de traiter la question controversée : « Les sophismes sont-ils fréquents ? » Après des préliminaires sur la nécessité de clarifier la signification de 'sophisme ' comme celle de 'fréquence', il montre que l'insistance sur le thème de la fréquence d'occurrence des sophismes est récente et liée à des définitions contemporaines en faisant une condition nécessaire. Il discute ensuite trois approches différentes, controversées, censées étayer la thèse de la fréquence des sophismes. Or, toutes soulèvent doutes ou objections ou s'avèrent controversées d'un point de vue méthodologique. Finalement, un complément d'enquête empirique est attendu pour répondre à la question.

Keywords: argument, communication, error, fallacies, frequency, logic, reasoning

1. Introduction

Are fallacies frequent? Even when the term 'fallacy' is limited to arguments—as in this paper—many argumentation theorists think that they are. Beyond its theoretical interest, this affirmative position has important practical consequences for academic courses

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about critical thinking. If fallacies are frequent, the two practical goals claimed for the teaching of fallacies—that is to not be trapped by others' fallacies and to avoid fallacies in one's own arguments—are likely to be more readily accepted.

Unfortunately, to give a convincing answer to this seemingly simple question is not as easy as it may seem at first glance. The question itself is rather complicated, which makes it difficult to provide indisputable evidence for a general, non-circumstantial answer. To say that fallacies are 'frequent' or 'common' requires at least a preliminary quantitative estimate, if not a count. Yet to count fallacies, you must first identify them. This is the first challenge, given that the very concept of fallacy is controversial.

The first part of the paper compares definitions of fallacies dating from antiquity to the mid-20th century. Most of these definitions do not stress the frequency of fallacies, which means, therefore, that it can, at most, be a concern that is important but secondary. The paper then discusses contemporary definitions that mention and sometimes even require frequency, or rather frequent occurrence, as a criterion of fallacy. Frequency is a concern associated with the idea that fallacies not only concern sophists and naïve people, but that anybody can commit or be trapped by fallacies. This view claims to be supported by empirical evidence.

The second part of the paper deals with the various kinds of evidence that have been put forward to support the frequency thesis. It begins with some general methodological considerations about what can count as empirical support. Then it discusses three different kinds of empirical approaches. I call the first 'familiar informal support.' It is based on the personal opinions of people who usually have some expertise or interest in the field of argumentation and fallacies and mostly rely on their own experience or common hearsays rather than on systematic observations or experiments. By contrast, the second and third approaches are more systematic. The second one relies on careful observation of some discourses to determine whether fallacies are frequent. This is referred to as 'observational evidence' as there is no interaction between the speaker likely to utter fallacies and the observer. The third 'experimental' approach is based on tests that are typically designed and practiced by psychologists. Subjects are asked to

answer various questions or complete tasks in order to evaluate their reasoning. None of these approaches provides decisive, uncontroversial general results.

Before turning to definitions, a few words should be said about 'frequent' and 'frequency.' In informal contexts, 'frequent' is often a vague term, similar to other quantitative vague terms such as 'often' or 'common.' When it is used in more rigorous contexts, 'frequency' is a relative concept in the sense that it makes a comparison typically expressed by a numerical ratio. The frequency of a phenomenon is the ratio of the number of its occurrences to a chosen unit or span that in many instances measures time or space. In the case of the frequency of fallacious arguments, this unit could be, say, the duration of a speech or the length of a paper or a book. If there is no problem identifying fallacies, one could state "The frequency of fallacies in this speech, paper, or book is X per Y." Yet, the statement of the numerical value of a frequency is often insufficient, unless it is compared with another. Suppose you find three fallacies in a two-page text. Are fallacies frequent? Using a numerical value instead of a vague term ('frequent,' 'common,' or 'usual') may be a red herring. Numbers may give the impression of precision or accuracy, but it is often an illusion when no explicit or implicit reference or comparison is made.

Milestones tend to be steadily spaced along roads. In Country A, their frequency is, say, one per mile. Are they frequent? I doubt that opinion is unanimous. The frequency of milestones is one per kilometer in Country B. Are they frequent? Here again, I doubt that opinion would be unanimous. Yet everybody will agree that milestones are more frequent in Country B than in Country A. Frequencies are often compared, thus 'relative,' which is not to be confused with 'relative frequency' as it is used here: "The relative frequency of tails is ½ when you toss an unbiased coin." The former is a kind of second-order frequency (a comparison of frequencies), and the latter is a kind of first-order frequency (because frequency is basically a relative term). Now, imagine that all the milestones on a several kilometer long road from point C to D have been placed along its first kilometer. Has their frequency changed? Again, I doubt opinions would be unanimous. This draws our attention to the concept of density, which is probably

used less often than frequency but is often identified with it. Like frequency, density is usually expressed by a ratio. Although the milestones' distribution has changed, their number has not. This could be expressed thusly: "Their local frequency has changed, but their global density has not" or, conversely, "Their local density has changed, but their global frequency has not." The point is not to set the most convenient term but to raise an important question about fallacies: what does it mean to say that fallacies are frequent? Is it a question of repartition or only of rate? The unit, domain, or class of reference must be specified. Otherwise, to say that "fallacies are frequent" amounts to an equivocation or, at most, a vague statement.

Common sense suggests a basic answer to the question: "Well, it depends on the way you define fallacy." As the previous examples demonstrate, a similar remark could be made about the term 'frequent.' However, an agreement on this last term is easier because frequency has a general definition and can then be measured in an undisputed way. Unfortunately, this is not the case with 'fallacy,' which has no undisputed definition. Grootendorst (1987) aptly remarked that fallacies do not exist in the same way as buttercups and therefore cannot be counted in the same way as buttercups. But, contrary to his position, I think that we don't need a clear academic or scientific theory about fallacies to understand that something is off about some arguments, just as it is not necessary to have a theory of breathing in order to breathe. I rather agree with Woods (2004), holding the (common) position that we are sensitive to fallacies. More precisely, my opinion is that we, as laypeople, are sensitive to some fallacies but not all—we are not sensitive to any fallacy and not to any token of a fallacy. This sensitivity explains why fallacies may be better introduced by example than by an abstract general definition. However, this sensitivity is no reason to overlook our failures, hesitations, and uncertainties and, therefore, some dispersion of opinions about the fallaciousness of an argument. Many of my students are puzzled when they approach fallacies from the perspective of a classical definition ("A fallacy is an argument that looks better than it actually is"). They acknowledge some examples, yet they hesitate over or feel embarrassed by others. So, it is no surprise that, despite our

sensitivity to some fallacies and beyond the lack of consensus on their definition, there may still be difficulties in evaluating their frequency. It is like trying to evaluate the frequency of lies or of the use of false money.

I am rather sympathetic to the view that it is possible to give a general answer to the question "Are fallacies frequent?" but only about some kinds of fallacies and in particular cases. For instance, because some conversational situations are familiar (such as the use of a personal attack), we are very sensitive to this common verbal behavior, including when it is used in arguments. This may easily lead one to think that *ad hominem* arguments are frequent. However, the claim that fallacies are frequent is much bolder when it is understood *simpliciter*, as a general claim about any kind of fallacy. In this case, I am more skeptical. But this position challenges some recent definitions that consider frequent occurrence as an essential aspect of fallacies.

2. Definitions

Most influential definitions or quasi-definitions of fallacies from antiquity to the 20th century do not state anything about their frequency or claim that they are common. Frequency is at most discussed as a secondary property, in connection with psychological or moral considerations. Yet, some definitions already raise questions about what should be counted as fallacies, a point that must be clarified prior to any systematic investigation of their frequency.

2.1 Definitions from antiquity to the 20th century

In the first lines of *On Sophistical Refutations* (164a20-25), Aristotle introduces the concept of paralogism (commonly translated as 'fallacy') as an argument that "appears to be a refutation." He adds: "That some reasonings (*syllogisms*) are really reasonings, but that others seem to be, but are not really reasonings, is obvious" (1955, p. 11). This is the master definition of the pseudo syllogism. Nothing is said about its frequency; yet, a few lines further, Aristotle states: "…reasoning and refutation are sometimes real and sometimes not, but appear to be real, owing to

men's inexperience; for the inexperienced are like those who see things from a distance." Thus, only inexperienced people are trapped by fallacies. Who are they? Perhaps anyone who is not a trained philosopher. This suggests that the occurrence of fallacies, and thus in some sense their frequency, depends on two types of person: sophists and inexperienced people.

More than four hundred years later, in his *Outlines of Skepticism* (II, 22, 229), Sextus Empiricus gave a definition borrowed from "the dialecticians," who were probably Stoics: "They say that a sophism (*sophisma*) is a plausible and treacherous argument leading one to accept the consequence which is either false or similar to something false or unclear or in some other way unacceptable" (1994, p. 131). This definition is similar to Aristotle's. It says nothing about the frequency of fallacies, granted that 'fallacy' and 'sophism' are synonymous. Sextus' skepticism leads him to think that the study of fallacies is time lost. Yet, one of Sextus' comments raises a question about what should be counted as a fallacy. Sextus first writes: "Thus when an argument is propounded in which the conclusion is false, we know directly that the argument is not true and not conclusive from the fact that it has a false conclusion; and so we shall not assent to it, even if we do not know the cause of the error." (II, 22, 250) He then makes a comparison with a magic trick: it seems true, but we know that it is false. Hence a new question. Does the frequency of fallacies refer to their production or their acceptance? According to Sextus, we may be impressed by the skill of the sophist without accepting their fallacy. This raises a more general question. When a proponent puts forth a non-intentional fallacy that is accepted by a respondent, have there not been two fallacies? Does a fallacy count if it traps nobody? If it does not, the examples of fallacies given in university lectures and textbooks should be disregarded. However, if we reject distinctions based on the state of mind of the person giving an example because it would be an unwelcome manifestation of psychologism, we should consider the examples of fallacies given during a course on this topic as genuine fallacies.

In the 13th century, Peter of Spain writes in his *Summaries of Logic*:

> A sophistical disputation is one that forms a syllogism from statements that seem confirmable and are not. The instrument of this disputation is the sophistical syllogism. But a sophistical syllogism is one that appears to be a syllogism where none exists […] (2014, p. 261).

Peter speaks of sophistical syllogisms, not of fallacies, although he uses the word *fallacie* a few pages later when referring to 'the thirteen fallacies.' Any doubt about the equivalence of Aristotle's paralogisms and Peter's fallacies is dispelled when he adds: "Six of them are within language, seven outside of language" (2014, p. 269). Then, he comments:

> Having noted these things, we must discuss equivocation or the fallacy of equivocation. But understand that 'fallacy' is said in two ways: said in one way, a fallacy is a deception caused in us, but said in another way, a 'fallacy' is a cause or principle of that deception. And here we mean fallacies in that second sense (2014, p. 271).

Here again, nothing is said about the frequency of fallacies, but Peter's last comment raises another issue about what should be taken into account when determining the frequency of fallacies. For we could, and perhaps should, distinguish between 1) the utterance of a fallacious argument, 2) its success with a listener or an audience, and, 3) to use Peter's terms, the cause that makes this argument fallacious. In other words, should we count the deliberate fallacy made by a sophist the same way as the unfortunate fallacy made by an "inexperienced" arguer, trapped by their own fallacy?

Four centuries later, Arnauld and Nicole's *Port-Royal Logic* (1662/1996) was one of if not the first of the great modern texts on fallacies showing some interest in something similar to their frequency. This book is paradoxical. It is a very influential book about logic, but also a book against logic, at least as practiced by the Schoolmen (Dufour, 2019). It has two chapters on fallacies. The title of the first one is "Different ways of reasoning badly, which are called sophisms (*sophismes*)." Aristotle's fallacies are listed, and two new ones are added. In a way, all of them are field-

dependent, for they are "common errors committed in reasoning about scientific matters" (Arnauld and Nicole 1996, p. 203). Accordingly, they are common, but they are also infrequent in the sense that people who are able to reason about scientific matters are rare. Fallacies or sophisms are not defined in this chapter, but the first lines read, "So it will be helpful to describe the main sources of bad reasoning, which are called *sophisms* or *paralogisms* since that will make it even easier to avoid them" (Arnauld and Nicole 1996, p. 189). The title of the second chapter on fallacies is quite different: "Fallacies committed in everyday life and in ordinary discourse." This concerns everyone, and the author claims that these fallacies are more important because they are morally bad and concern the "main use of reason" (p. 203). Accordingly, it will be "more useful to consider what usually leads people to make false judgments on all sorts of topics, mainly in morality and other matters important to everyday life, which are the usual topics of conversation" (p. 203). This is an ambitious program, but "we will be satisfied here to indicate generally some of the causes of these false judgments that are so common among people." So, fallacies of this kind are widespread: many people are fallacy makers, and even probably everybody if we share the pessimism of the Jansenist fathers who wrote *Port-Royal Logic*. Fallacies have become sins: they are errors that people are wrong to make, even when they are the victims of a sophist's bad intentions. These mistakes depend on logic, but first and foremost, they are a *moral* concern for everybody at almost anytime and "on all sorts of topics" (p. 203). Thus, the most frequent fallacies, that is, those that are the most widespread, are not the Aristotelian "scientific" ones but those introduced in the second chapter. By putting aside the Aristotelian scholastic tradition and denouncing the immorality of (some) fallacies, the *Logic* did not only subordinate logic to ethics, but also opened the question of the frequency of fallacies and took a clear stand.

A concern for morality and, indirectly, with the frequency of fallacies, is also present in *The Art of Always Being Right*, the short essay about eristic dialectics that Schopenhauer wrote around 1830. For him, Aristotle was wrong not to make a more clear-cut distinction between the quest for truth, which Schopenhauer asso-

ciates with logic, and the will to win, which he sees as the essence of dialectic. So, he eliminates the distinction between dialectic and eristic, since the most constant goal of each disputant is to win acceptance for their point of view. "Dialectic then has little to do with truth, as the fencing master who would consider who is in the right when a quarrel leads to a duel" (Schopenhauer 2017, p. 29). The study of dialectic is therefore like the study of handling weapons. Accordingly, the book is dedicated to dialectical ploys and tricks, including fallacies. Schopenhauer remains faithful to the Greek tradition in another way: fallacies are intentional. They are traps, not mere errors of reasoning, although the sophist expects an error to be made. His seeming neutrality as fencing master could make his approach appear morally neutral. Yet, his claim about the banality of eristical behaviors is linked to his view that human nature is perverse. Does he consider fallacies to be sins? No, Schopenhauer is far from the religious background of the authors of *Port-Royal Logic*. But there is a kind of moral continuity between them. They share a radical pessimism about human nature—hence Schopenhauer's explanation of the universal will to always be right:

> Our innate vanity, which is particularly sensitive in reference to our intellectual powers, will not allow that our first position was wrong and our adversary's right. The way out of this difficulty would be simply to take the trouble away to form a correct judgment. For this, a man would have to think before he spoke. But, with most men, innate vanity is accompanied by loquacity and innate dishonesty. They speak before they think, and even though they may afterward perceive that they are wrong they want it to seem the contrary. The interest in truth, which may be presumed to have been their only motive when they stated the proposition alleged to be true, now gives way to the interests of vanity. So, for the sake of vanity, what is true must seem false, and what is false must seem true (2017, pp. 24-25).

This description of the innate ethos of the dialectician could have been written by a Jansenist. So, despite differences, the same implicit qualitative answer to our question remains. Fallacies are frequent because human beings are innately inclined to bad faith

and cheating. Darwin had not yet made it possible for this tendency to be the potentially happy result of natural evolution.
Such a strong moral emphasis is not found in most of the later definitions of fallacy for they are more interested in logic than in human failures and their frequency. This is the case for Reverend Whately, who wrote a few years before Schopenhauer. The whole Book III of his *Elements of Logic* bears on fallacies (1826/2008). He claims to rely on a "common understanding" of what a fallacy is, namely "any unsound mode of arguing, which appears to demand our conviction, and to be decisive of the question in hand, when in fairness it is not." Whately grants that "the practical detection of each individual fallacy" very much depends on "natural and acquired acuteness," but he does not speculate on their frequency. His ambition is to scientifically examine a topic that, according to him, has been discussed in a loose or confused way.

A similar attitude can be found in De Morgan's long chapter on fallacies in *Formal Logic* (1847/2003, pp. 237-286). Beyond his famous opening remark expressing doubts on the very possibility of "a classification of the ways in which men may arrive at an error," he does not seem interested in the frequency of fallacies. De Morgan explains that he aims at a presentation of good reasoning, not bad reasoning. So, his comments on fallacies do not aim at investigating the dark sides of the human soul or human communication or the tricky manoeuvres of sophists. Instead they are intended to improve competence in good reasoning. As they say, "Except by the production of examples to exercise a beginner in the detection of breaches of rule, there is nothing to do in a chapter of fallacies, so far as those of inference are concerned."

Many definitions of the late 19th or early 20th century say nothing about the frequency of fallacies. As in De Morgan's case, even if a view was expressed that seemed related to this topic, it came as a secondary consideration because most of the philosophers were logicians or mathematicians who focused more on norms than on deviant uses of argument. For instance, in 1916, Joseph wrote simply, "A fallacy is an argument which appears to be conclusive when it is not" (1916, p. 566). In 1970, in his well-known book *Fallacies*, Hamblin's short definition remains close to this previous one. He even claims that it can be said to be classical or

traditional: "A fallacious argument, as almost any account since Aristotle onwards tells you, is one that seems to be valid but is not so" (1970, p. 12).[1]

Although the intellectual context of J. S Mill's work is quite different from the world of *Port-Royal Logic*, some of his ideas on fallacies in the fifth book of the second volume of his *System of Logic* bear some resemblance to those of the French fathers. First, bad reasoning brings us from the abstractions of logic to the down-to-earth moral condition of human beings, which is far from perfection. This has immediate consequences for the frequency of this kind of error of reasoning:

> In the conduct of life – in the practical business of mankind – wrong inferences, incorrect interpretations of experience, unless after much culture of the thinking faculty, are absolutely inevitable: and with most people, after the highest degree of culture they ever attain, such erroneous inferences, producing corresponding errors in conduct, are lamentably frequent. (1843/1872, p. 299)

Here again the idea is put forth that fallacies, defined as "the varieties of apparent evidence which are not real evidence" (p. 300), are rooted in general aspects of the human condition. Fallacies are like an endemic disease that affects not only deductive reasoning but also inductions. This view is unlike the Aristotelian one that fallacies (or rather paralogisms) are closely connected with syllogisms. Like *Port-Royal Logic*, Mill holds that the most serious fallacies are not restricted to a limited field (such as science). On the contrary, "the collective mind of the scientific world" makes possible that "the more perfect sciences" (p. 300), namely those that study the simplest objects, expel poorly justified opinions. But, the sciences that study more complex phenomena, especially "those of which the subject is man" are more prone to errors and bad reasoning. Like *Port-Royal Logic*, Mill claims that it is in the "conduct of life" that the occurrence of fallacies is the highest. Yet, his opinion is limited to a vague qualitative estimation of men's logical competence: "… the general consent of mankind, founded on their experience, vouches for their being far indeed from even this

[1] Other recent definitions can be found in (Hansen 2002).

negative kind of perfection [error avoidance] in the employment of their reasoning powers" (p. 299). Thus, like in *Port-Royal Logic* or Schopenhauer's book, the high frequency of fallacies and bad reasoning[2] is again based on general considerations about the banality of bad human behaviors. Mill stresses that even if their origin is moral, fallacies come through a loose intellectual process that could be improved:

> Every erroneous inference, though originating in moral causes, involves the intellectual operation of admitting insufficient evidence as sufficient; and whoever was on his guard against all kinds of inconclusive evidence which can be mistaken for conclusive, would be in no danger of being led into error even by the strongest bias. There are minds so strongly fortified on the intellectual side, that they could not blind themselves to the light of truth, however really desirous of doing so; they could not, with all the inclination in the world, pass off upon themselves bad arguments for good ones. If the sophistry of the intellect could be rendered impossible, that of the feelings, having no instrument to work with, would be powerless (1843/1872, p. 303).

The argument that fallacies are common or frequent because of the imperfection of human nature seems to have been commonplace at least since the 17th century. Mill provides no more precise information about their occurrence, except perhaps that they are rare in good science. Thus, this is another instance of the commonplace understanding that "people frequently make mistakes." A variant of this *topos* can be found in Max Black:

> In fact, it proves difficult for even the ablest and best-intentioned thinkers to conform to the standards of right reasoning, and not all men have good intentions. The arguments of the marketplace or the classroom are more often than not unsound, and correct reasoning is as rare as perfect health (1946, p. 229).

[2] To be more precise, a comparison between these various authors should also take into account the question of the intentionality of the use of fallacious arguments. Are we concerned by the frequency of errors, or tricks, or both? It has already been shown that this should be made clear before discussing the frequency of fallacies.

If correct reasoning is as rare as perfect health, then it is likely that fallacies, in essence, arguments "that *seem* to be sound without being so in fact" (Black 1946, p. 230), are frequent. Here again, this is just suggested and is no more than a qualitative generality.

Pragma-dialectics has been an important development in argumentation theory since the 1970s. It introduced an approach to fallacies that is based on procedural misbehaviour. This view is original because it is not primarily based on the concept of argument seen as a premises-conclusion system, but it is also not so new because it goes back to the common idea that fallacies are bound to cheating or to breaking the rules. Pragma-dialectics first holds that fallacies occur in the context of an exchange of arguments motivated by a difference of opinion. The analysis of this exchange is based on the normative model of the 'critical discussion' involving several steps and procedural rules. During their interaction, arguers put forward their points of view through what pragma-dialecticians call 'strategic maneuvers,' which are supposed to follow these rules. If they fail, a 'derailment' occurs. Van Eemeren writes: "All derailments of strategic maneuvering are fallacies in the sense that they violate one or more of the rules for critical discussion and all fallacies can be viewed as derailments of strategic maneuvering" (2010, p. 190). Pragma-dialecticians claim that most traditional fallacies can be accommodated by this definition. Thus, this view comes close to the lay meaning of 'fallacy' in several European languages: a fallacy or a fallacious move is a (verbal) trick used to deceive. Hence, fallacies will likely be more frequent according to the pragma-dialectical standard than according to more traditional ones. On the other hand, because of its meta-theoretical principle of 'externalization' that limits its focus to only the "public commitments entailed by the performance of certain language activities" (Van Eemeren and Grootendorst 2004, p. 53), pragma-dialectics should not consider a private fallacious argument—a 'mental' fallacy—as a fallacy. Only public derailments are fallacies.

To sum up, most traditional accounts did not pay attention to the frequency of fallacies, which is at most a secondary topic in ancient and medieval dialectical approaches. Some concern about

it sometimes appeared after the 16th century but remained limited to general moral considerations on the imperfection of human beings that bad reasoning confirms. It is this intrinsic human fallibility that made fallacies 'common' or 'frequent' without any further qualification.

2.2 Fallacies are frequent

In 1987, Govier wrote, "By definition, a fallacy is a mistake in reasoning, a mistake which occurs with some frequency in real arguments and which is characteristically deceptive" (p. 177). She stresses that the deception may be unintentional and adds a strong but vague quantitative claim: a fallacy "strikes many people as cogent, though it is not" (p. 177). So, many people—not only "inexperienced" ones as in Aristotle's definition—are deceived. A similar definition is introduced in her textbook, for instance, in the 2005 version:

> A fallacy is a mistaken argument or step in argument that is often not noticed and, as a result, appears with some frequency. Fallacies tend to be deceptive. Fallacious arguments are not cogent arguments, but they may appear cogent because the mistakes involved are not detected" (Govier 2005, p. 107).

Because this last quotation comes from a textbook, some views may have been exaggerated or simplified to be more accessible to untrained students. Yet, it is difficult not to wonder who does not detect the mistakes. Coming from a more theoretical book, Govier's first definition is more explicit on this point: "many people" are deceived (p. 177). Govier does not mention any class of reference in her frequency statement beyond the claim that fallacies are frequent because they go unnoticed. Yet, her statement is open to quite different interpretations and to the kind of questions that we have previously raised. For instance, it is unclear whether she only means that the rate of fallacies is high among all the arguments produced or granted by people or whether it is high in some kinds of discourse, some places, some pragmatic situations, and, of course, coming from the mouths of some people.

We have seen that *Port-Royal Logic* holds that there are many fallacy *makers* (most of us if not all of us). Govier (1987) claims that there are many fallacy *believers*, granted that to believe a fallacy means to mistakenly take it as a cogent argument. This also goes back to a previous methodological question: what should be taken into account in the evaluation of the frequency of fallacies—their occurrences, their successes (namely, the number or the rate of people deceived, or both?

So, if the statement that "fallacies are frequent" amounts to "many people are deceived by fallacies," the related question remains: "What about fallacies makers?" During antiquity, it seems that the dominant view was that a fallacy is produced by a sophist who tries to deceive someone. The focus was less on the believer than on the maker—the sophist who was supposed to not be trapped by their own trick. Yet, sophists are perhaps rare, and this could be a reason to abandon the ancient paradigm, which is too limited for a general study of the occurrence of fallacies. Is this a good reason to limit the inquiry about frequency to people who have been tricked (believers)? Should we leave aside sophists who do not believe in their fallacies but contribute to the frequency of fallacies even when their tricks fail? If these points are not clarified, the conclusion of the inquiry could be biased because of ambiguous results.

Furthermore, the distinction between fallacy makers and believers is not that clear, for a fallacy believer can also be seen as a fallacy maker, for grasping an argument (even a fallacious one) amounts to making it for oneself. Otherwise, one is not trapped by the *reasoning.* On the contrary, a fallacy believer is not a fallacy maker if one grants the conclusion of an argument for any reason other than the premises: for instance, one could be impressed by the ethos of the speaker. Accordingly, an empirical inquiry on the frequency of fallacies can be seen to be biased not only because it does not take into account intentional fallacies but also because it does not take into account the case of people who accept a conclusion for any reason other than the premises of the argument. As we shall see, this is a serious challenge to some studies of bad reasoning in experimental psychology.

Nowadays, the distinction between fallacy makers and believers is often blurred or overlooked, as most contemporary pragmatic argumentation theories make no clear distinction between deliberate and non-deliberate fallacies. This may not be an omission or oversight, but a consequence of the deliberate rejection of considerations that could be suspected of psychologism. Yet, it seems that when Govier speaks of the frequency of a fallacy, her concern is more about the frequency of the utterance than the acceptance of fallacies, both being correlated. Fallacies probably would not be uttered if nobody were likely to accept them. Govier (1987) seems to grant this point when she says that the frequency of fallacies is a consequence of their being frequently unnoticed.

It has already been emphasized that the first step of an inquiry into the frequency of fallacies is establishing that a fallacy has been committed. Especially in the context of an argument (in the sense of a dispute), the identification of a fallacy may be controversial. If the participants are unable to reach an agreement on the fallaciousness of the argument at hand that is correct, another option to determine whether there was a fallacy is to call on impartial experts, especially if, as suggested by Govier (1987), many (non-expert) people often do not see fallacies. In practice, this seems too demanding. We shall see that in the three types of empirical study discussed further, inquirers presuppose that they are expert enough to impartially decide about the fallaciousness of arguments. If you doubt the expertise of the inquirer, your doubt could spread to the very result of the inquiry and thus to their claim about the frequency of fallacies. However, if you are less pessimistic than Govier about the rate of people who do not see that an argument is fallacious, this may be a minor problem. Many people could be expert enough to rightly judge whether an argument is fallacious, except when they are in bad faith.

In the second definition given above, frequency is not introduced by Govier (2005) as a necessary condition of fallacy but as a consequence of the fact she claims that they are "often not noticed" (p. 107) So, quantity does matter to her. To stress that a fallacy is not any mistake of reasoning, she writes: "A fallacy is a mistake which is of a kind: it is repeatable and repeated in other contexts" (1987, p. 177).

Why is this point important for Govier's theory of fallacies? Because it does not only show that you can repeat the same argument, but that the same kind of argument reappears. So, a fallacy of the same kind is likely to occur again, uttered by the same person or by someone else in another context. Fallacies are not strictly idiomatic or single errors. Rather than being linked to a single person, a fallacy is a common mistake in the sense that it can be shared by "many people." In keeping with Govier, even if some aspects of a fallacy may be context-dependent, the whole of it is not. What support does she provide for the claim that a fallacy is common or frequent? Does she think that it is a consequence of the wickedness or the perversity of human beings, like in *Port Royal Logic* or Schopenhauer? I doubt it. Is her claim more directly empirically supported? This seems more likely, and the question of empirical evidence will soon be discussed. Yet, even if a fallacy is a kind of mistake, this does not entail anything about its frequency. Some natural kinds are rare, and some are even empty. The Florida panther is rare, and the coelacanth has disappeared. In the field of fallacies, you may wonder whether, despite some attempts, contemporary languages did succeed in domesticating and preserving the Aristotelian fallacy of accent.

A similar view is expressed by R. Johnson who makes salient another point linking kind and frequency. He intends to "revitalize" what he calls "fallacy theory" and this "requires a revision of our conception of fallacy" (1995, p. 115). In his search for a new definition that would avoid what he takes to be serious drawbacks of previous definitions, he writes: "We should introduce the notion of frequency because a fallacy is not just any mistake in argument, but one that occurs with some frequency" (1995, p. 116). And this leads him to a new definition: "A fallacy is an argument that violates one of the criteria/standards of good argument and that occurs with sufficient frequency in discourse to warrant being baptized" (1995, p. 116). In *Logical Self-Defense*, the textbook he coauthored with J. A. Blair, there is a similar definition: "By *fallacy*, we mean a pattern of argumentation that violates one of the criteria a good argument must satisfy and that occurs with some marked degree of frequency" (1977/2006, p. 54).

If for these authors frequency is not, strictly speaking, a necessary condition of a fallacy, it is at least an empirical property that is sufficiently important to be registered in these new definitions and in a revitalized theory. For, according to Johnson, there is a strong connection between a fallacy and the fact that it has a specific name. The name distinguishes a particular kind of bad argument from other arguments that are just "not good"; for instance, mere errors of reasoning. Walton too subscribed to the use of frequency to distinguish fallacies from nameless punctual errors: "The term 'baptizable' is due to Johnson (1987). A baptizable error is one that is common enough and serious enough to merit naming as a fallacy" (1995, p. 305).

The frequent occurrence of a phenomenon can be a reason to give it a name, although many phenomena frequent and "serious enough" to merit a name have none and some names refer to few things and sometimes to no actual thing. Furthermore, some things have a name in one language but not in another. The availability of names to designate fallacies certainly makes the theorists' life easier, but no aspect motivating the use of qualifiers like 'common' or 'frequent' seems to have been striking enough to be included in ancient definitions. Aristotle may have met sophists who frequently used the same kinds of paralogisms, but he may also have been struck by one he never noticed and decided to give it a name. The connection between the frequency of a phenomenon and its naming is quite loose: you can name something that you have met only once or even never. Are unicorns common? Who has seen the Apocalypse?

In *On Sophistical Refutations*, Aristotle claimed to have listed all the paralogisms, but new ones were quickly introduced by the Megarian and the Stoics. Today, despite their numerous disagreements, most argumentation theorists grant that Aristotle's list is not exhaustive. Is there any evidence that all the fallacies that joined the Aristotelian band have been frequently noticed before gaining their names? I do not know; I am still waiting for proof. Let us consider what Govier calls the Slippery Assimilation fallacy which is, as she explains, the contemporary version of the old Sorites of the Megarians. As far as naming is concerned, it is interesting to note that this fallacy, which is based on the vague-

ness of the concept of heap (*soros* in Greek) quickly had at least one variant with a different name: 'the bald,' based on the vagueness of the concept of baldness. We don't know a lot about the origin of this fallacy that the ancient Greeks called a *sophisma* ('paralogism' seems to have been a name typically Aristotelian). The Sorites has probably been devised in the context of theoretical debates between competing philosophical schools (Wheeler 1983). Was it frequent or common beyond these schools? Was it baptized because it was frequent among laypeople? The burden of proof is on the side of the theorists I will call *frequentists*. In any case, the suggestive English name of this fallacy is not the translation of one of its Greek names, and it probably appeared after centuries of philosophical discussions on the Sorites, discussions that likely were motivated by academic philosophical disputes, not by the fact that this fallacy was frequently committed by many people.

Finocchiaro is skeptical about fallacies being frequent. He writes: "logically incorrect arguments may be common, but common types of logically incorrect arguments probably are not" (2005, p. 113). The adjective 'frequent' is not used here, but the issue bears on the central question of this paper. Finocchiaro becomes more radical when he asks: "Do fallacies exist in practice? Or do they exist only in the mind of the interpreter who is claiming that a fallacy is being committed?" Now, the issue is not the frequency, but the very existence of fallacies and their identification. When you are certain that the conclusion of an argument is false, but you do not see what goes wrong in their premises or their link with the conclusion, it seems reasonable to say that there must be a mistake somewhere and that the argument seems better than it is. In such a case, the claim that a fallacy has been committed is not surprising. But Finocchiaro goes one step further. Starting from his observation of the "paucity of actual examples" in logic textbooks, he suggests that logicians use devices that are prejudicial "in the sense that their fallaciousness is built right into their description" (p. 114). So, it is not only ordinary arguers who discover fallacies where there may be none, but logicians themselves who forge fake ones. Hence, fallacies would "become logician's fictions or at best practices seldom found in reality" (p. 114). So, the claim that fallacies are frequent would be a kind of legend of logicians.

In *Errors of Reasoning*, John Woods (2013) takes a remarkable position inspired by Finocchiaro's doubts. He holds two theses: "The first idea is the rarity thesis, which claims that so-called fallacies are rarely committed. The other, a corollary of the first, is the *negative thesis* that the so-called fallacies aren't fallacies at all" (2013, p. 6). Thus, according to him, (so-called) fallacies are rare, but the reasonings that logicians commonly take for fallacies are not. This common view about (so-called) fallacies would be the result of a historical evolution: "the logician's standard view of fallacies is that they are a special class of errors of reasoning, errors that are frequently characterized as 'logical'. As already remarked, they are errors that are common enough to qualify for a kind of universality. They are also attractive; they are errors towards which people, in general, are drawn. They are also bad habits. They are difficult to break and so, in a sense, are incorrigible" (p. 135). 'Error,' 'attractive,' 'universal' and 'incorrigible' make up the acronym EAUI. Taken together, these qualifiers make four good reasons supporting the claim that (so-called) fallacies are frequent. But according to Woods, most of the reasonings sheltered by the traditional fallacies that he gathers under the name "gang of the eighteen"—which includes equivocation, *gnorati*, *secundum quid*, and *gnoration elenchi*, among others—do not satisfy all the EAUI requirements. So, the traditional fallacies do not qualify as so-called fallacies, and their alleged frequency does not benefit from the conjunction of the three frequency amplifying factors, namely universality, attractiveness, and incorrigibility. At most, the members of the gang of the eighteen appear to be so-called fallacies, but this is not enough to make them fallacious and frequent.

However, we have seen that to avoid being vague, the concept of 'frequency' needs to rely on measurement, hence a comparison expressed by a ratio between the number of occurrences of the phenomenon studied and the extension or the amplitude of a reference class. Concerning fallacies, we have already suggested the possibility that their frequency could be relative to the duration of a speech, or the number of statements or arguments put forwards in a monologue or a dialogue. Woods (2013) proposes another kind of comparison, based on the concept of 'occasioned frequen-

cy.' Applied to a reasoning practice, it is "the frequency of its commission relative to occasions to commit it" (2013, p. 140). Woods' first answer to "Are fallacies frequent?" is "No, they are rare." One reason for this rarity is that "the occasioned frequency of the eighteen is low" (p. 140) because the frequency of the occasions to commit this or that particular kind of fallacy is itself low. But Woods grants that given the opportunity to commit this or that kind of fallacy, "virtually everyone is disposed to commit [it] with a frequency that, while comparatively low, is non trivially greater than the occasioned frequency of their reasoning errors in general" (p. 141). I suggest the following as a reformulation of this comparison: fallacies are more frequent than other errors of reasoning when people have the opportunity to commit errors of reasoning.

The whole scenario is a bit complicated because Woods also acknowledges that there are hidden genuine fallacies and also many instances of false fallacies created by logicians. This makes the task of identifying and counting fallacies to evaluate their frequency difficult.

3. Empirical support for the frequency thesis

Different types of empirical considerations have been used to support the frequency thesis. Before presenting and discussing three of them, it is important to pay careful attention to some difficulties they are likely to face and some methodological points that should be clarified to prevent ambiguities and confusion about the relevance and value of empirical results.

3.1 Methodological considerations

Apart from the issue of defining fallacy, two important questions have been raised. First, will the empirical study state the frequency of uttered fallacies and/or accepted fallacies knowing that they sometimes overlap? The second question is related to the first: will the study take into account whether an uttered fallacy is intentionally deceptive or not?

For any inquiry into the frequency of fallacies, the concept of fallacy must be made clear—especially in the current context of rival definitions. Nevertheless, this stage can remain implicit. For

instance, the participants can be asked about a suspicious argument, but not required to provide a precise description of what is wrong with it if they feel that there is a problem. This call to intuition is a common way of highlighting whether people grasp (or not) that an argument is classically fallacious.

This could be a starting point to determine whether fallacies, defined in this classical way, are frequent or not. Indeed, it is the basis of some experimental psychology studies. Yet even if the majority of people agree on the fallaciousness of an argument, others may disagree for various reasons. Other than expert sophists, most people usually do not see their own arguments as fallacious. This happens not only because they do not question the value of their argument, but first and foremost because they are blind to their own mistakes. To avoid this kind of bias, test subjects should not focus on their own arguments. On the other hand, there is a risk of misunderstanding other people's arguments. This may lead to unintentional straw man fallacies, which would bias or disperse the results of the inquiry into the frequency of fallacies.

Failing to identify an argument may result in missing a fallacious one. Moreover, an argument tends to deceive only if it can be interpreted in different ways. Although an argument may be identified, its multiple interpretations might not be, and it may, therefore, not be deemed fallacious. This may or may not be the result of personal negligence. For instance, if all kinds of fallacious arguments are not already known, you may consider an unknown kind of fallacy to not be fallacious. The reverse is also true. An argument that is not fallacious may be deemed fallacious; for instance, if a relevant premise is considered to be irrelevant because its relevance is unclear. These mistakes or confusions can lead to errors in the evaluation of the frequency of fallacies.

To be considered decisive, empirical results must be stable, which means that they are replicable. What this means in the case of the frequency of fallacies may not be clear. Fallacious arguments may or may not be deliberately produced or replicated. As silly as it may seem, one can even make as if fallacies are by quickly repeating uncontroversial fallacies in a short span of time. Why does this "repetition game" seem silly? Because the claim that fallacies are frequent is implicitly supposed to be universal, at

least in the sense that a fallacy is not intentional and may occur at any *relevant* time, in agreement with the standard that Woods calls EAUI (Error Attractive, Universal, and Incorrigible). To quickly repeat a fallacy to show that fallacies are frequent does not count as a relevant example of the occurrence of a fallacy.

Yet, some empirical studies supporting the frequentist view only consider a limited amount of time and do not take the intentions of the fallacy makers into consideration. Proponents of dialectical approaches will also probably counter the case of the deliberate repetition of fallacies with the idea that a fallacy cannot be produced alone. Unfortunately, a quick succession of fallacies can be acted out with an accomplice (in a theater play or a reality television show, for example, or any kind of deliberate eristic dialogue[3]), and the claim can then be made that fallacies are frequent. This point is more serious than it seems and again highlights the importance of the neglected criterion of the intentionality to deceive. Again, the question arises as to whether an inquiry should take this kind of artificial situation or classroom or textbook examples of fallacies into account. Should the fallacies in Plato's *Euthydemus* be taken into account? It seems reasonable to discard all these fake, fictitious, or *ad hoc* fallacies and only give heed to "genuine" fallacies, which are honest mistakes—although you may not know when a person is being honest.

All of this reveals some possible flaws or biases that threaten any inquiry into the frequency of fallacies and raises some points that should be clarified to avoid them. Let us now turn to three different kinds of investigations of the empirical frequency of fallacies, keeping in mind that 'frequent' can be interpreted in different ways, as these studies illustrate.

3.2 Informal familiar support

Because it is limited and open to many biases and mistakes (namely those discussed in the previous paragraph), testimony based on the informal experience of a single subject is a clue, but it is certainly not sufficient to answer the guiding question. We will say that support based on testimony is informal in the sense that it has

[3] On the notion of eristic dialogue, see for instance (Walton 1998, chap 7)

not been the object of a systematic, methodically organized, and published study. And it is 'familiar' not only because it is based on informal personal experience, but also because it is presumed to be easily checked and, accordingly, shared by other people.

If only some kinds of fallacy are frequent—in the sense that their occurrence is not limited by time or space or by the borders of abstract fields or disciplines, or by the frame of specific events or situations, such as political speeches or exchanges with friends—then it seems reasonable to think that at least some of them should be and are easy to identify anywhere, at anytime, and by anybody paying minimal attention to them. The extension of this subset of fallacies may seem large enough to support the unqualified generalization that fallacies are frequent. For instance, because you find that fallacies like denying the antecedent, ad hominem, post hoc, and a few others are frequent, you may draw the hasty conclusion that any fallacy is frequent.

The testimony of "experts," in essence, people interested and competent enough in this field, is certainly an important clue. Do experts confirm that fallacies are frequent according to their own experience without taking into account hearsay or systematic empirical studies? Johnson (1995, p. 114) expressly supports this view and claims it is commonplace among specialists: "There are common errors in reasoning, as anyone who has spent any amount of time analyzing ordinary responses to reasoning knows." Beyond his reference to some cognitive psychology studies, he supports his frequentist view with three pragmatic situations: personal attacks, the distortion of arguments, and the use of red herrings. These situations pave the way for the three types of fallacies that he holds to be basic because they typically illustrate the three main possible defects of an argument: "irrelevant reason, hasty conclusion, and problematic premise" (Johnson 1995, p. 117). According to Johnson, more fallacies would be linked to these pragmatic situations, for the other fallacies would be "species belonging to one of the three basic types." So, the familiarity (*i.e.,* frequency) of these practices is supposed to lead to the conclusion that all the associated (fallacious) arguments are also frequent, in the sense of being 'common.'

Notice that the acknowledgment of this conclusion, which is associated with specific but common pragmatic situations, is not the privilege of highly specialized experts: it is accessible, according to Johnson, to anybody who has spent some time on this question. *Contra* Finocchiaro, the existence and frequency of fallacies is not a logician's dream but an easily verifiable factual truth for experts and people who have spent time on this topic. Thus, if we accept Johnson's ideas, the path is open to the general thesis that fallacies are frequent.

Anyone who claims to have frequently heard or read fallacies should be able to give various and numerous original examples based on their informal experience. But this goes against the paucity of examples in textbooks and the return to the same well-worn ones, even in those written by experts, as Hamblin and Finocchiaro have pointed out. Yet, even if memory is often weak and unfaithful, original examples borrowed from past experience can still reasonably be expected if fallacies are really frequent, in the broad sense of being 'common.' The fact that people who have some experience in this field—and sometimes even experts—have trouble producing original examples coming from their own experience is no surprise. Producing new fallacies that are both original and subtle often requires a serious investment of more than a few seconds. However, if even experts can only think of a few, it may be difficult to convince skeptics that their experience shows that fallacies are frequent. Of course, this relative failure is no evidence that the contrary is true, namely that fallacies are not frequent.

You could reply to Finocchiaro's objection, which is based on the poverty of original examples in textbooks, that to be easily understood by students, the fallaciousness of examples should neither be too obvious nor too complicated to understand. If it is too obvious, they will say that it will not deceive anybody. If it is too complicated, its occurrence will seem implausible, especially in a dialectical oral exchange. This could explain the paucity of new examples. Nevertheless, if the claim that fallacies are frequent means that any kind of fallacy can frequently be observed, it seems reasonable to expect that experts could quickly provide a variety of original observed examples of any kind of fallacy. I confess I am certainly not expert enough to do that, and I doubt

that many people can easily quote or even imagine many original, subtle occurrences of *non-causa pro causa* as defined by Aristotle in *On Sophistical Refutations*.

Counting fallacies is perhaps too demanding and even unrealistic in ordinary situations. If the term 'frequent' is understood qualitatively as 'common' or 'familiar,' only some fallacies could be said to be 'frequent' because they are likely to occur in familiar kinds of interactions, as suggested by Johnson (1995). But in this case, the claim that fallacies are frequent is weaker because they only occur in some places, fields, times, and so forth.

I can testify that some of my students have difficulty understanding what a fallacious argument is. However, they very quickly grasp that something is amiss in some examples of fallacies. Most of them are also very familiar with situations where fallacies are likely to occur as suggested by Johnson. This familiarity helps, for they quickly understand that *ad hominem* arguments have something to do with common direct personal attacks ("You are too stupid to understand"). They also quickly agree that it is an exaggeration to write, as they commonly do, that a famous author has 'shown' that *p* when that author has only 'written' that *p*. They also grant that "I don't want because I don't want" is commonly used by parents (or other people) when they want to justify their position but don't want to express their true reasons. They also consider "A river runs. Anything that runs has feet. Therefore a river has feet" as a poor pun, and they agree that when they listen to a debate, if someone cannot support their view, this is no guarantee that their opponent is right. Thus, they are familiar with some communicative situations or uses of language or arguments prone to fallacy, but this does not mean that fallacies are frequent. Note that familiar communicational situations prone to fallacies meet Woods' distinction between a high disposition to commit fallacies and their actual frequency: "So a fallacy is an error in reasoning that virtually anyone is disposed to commit with a frequency that, while comparatively low, is nontrivially greater than the occasioned frequency of their reasoning errors in general" (2013, p. 141). These familiar dispositions do not answer the question of the actual frequency of fallacies.

3.3 Observations

Besides familiar informal experiences, specific observations provide factual information regarding frequency. I will discuss two studies that do not explicitly focus on this topic but lead to quantitative results. More examples would be welcome, but the goal of this paper is not to take a side on the controversial question of the frequency of fallacies but to list methodological difficulties that should be solved and choices that should be made explicit to make empirical evidence more convincing as far as the general thesis is concerned. My first concern is not to evaluate whether the definitions of a fallacy given in the next studies are acceptable or to determine whether it is true that a fallacy has occurred. It has already been stated that these (important) questions underlie parts of the problem of determining the frequency of fallacies and that the result of an empirical inquiry is likely to be highly dependent on definitional choices. So, I will make no detailed analysis of each alleged fallacy but only provide methodological comments on the way the study was conducted and whether it provides cogent empirical support for the thesis that fallacies are frequent.

The two studies have many things in common. First, I call them 'observations' in contrast with the 'experiments' discussed in the next section. By 'observation' I mean a study where the observer does not interfere with the subject they have chosen to study: they just remotely "look and listen." This avoids one of the difficulties previously listed: the observer lists utterances of fallacies that are pragmatically independent from them. They also do not consider whether the fallacies are accepted and do not raise the question of their intention. Both studies concern a political discourse—one of the most classic fields in rhetorical studies and discourse analysis of dialectical exchanges—and although they refer to different theoretical frames for fallacies, they emphasize, name, and count fallacies. Both refer to a temporal, quantitative interpretation of the word 'frequency': their results can be expressed as 'number of fallacies per discourse' and even 'number of fallacies per unit of time.'

3.3.1 Donald Trump's fallacies

The first example is a 22-minute YouTube video. It is not an academic study but rather an online course. It is published by TeachArgument, and it is made by an anonymous and invisible teacher that will be referred to here as Teacharg. This video is of the first three minutes of former US President Donald Trump's campaign announcement—a public monologue that lasted forty-five minutes. After his announcement that the video is about logical fallacies, Teacharg (2017) stops Trump's speech at each fallacy he identifies, provides its name, and explains what is wrong. A fallacy is defined as "An error in the reasoning or the logic of an argument […] that automatically makes that argument illegitimate" (Teacharg 2017). In further comments, he adds that it is "a hole in the reasoning" and "They are not necessarily bad strategies… They are not legitimate strategies in that they are not logically sound" (Teacharg 2017). I will only list the parts of Trump's speech where Teacharg identifies fallacies and his comments about them.

The video shows Trump walking slowly to the microphone. He looks and says, "Wow… that is some group of people… thousands." The video stops and Teacharg announces "the bandwagon fallacy"—that is, an appeal to popularity. He explains: "If thousands of people are there, then he must be a viable candidate" (Teacharg 2017).

Trump laughs at the other candidates that were in the same place (Trump Tower) but didn't know that the air conditioning was not working. "They sweated like dogs…they didn't know that the room was too big because they didn't have anybody there … how are they going to beat Isis [the Islamic group]?" Teacharg (2017) says, "This is the "false cause fallacy": the other candidates cannot beat Isis because they are not even able to understand and solve the air-conditioning problem."

Trump continues with one of his leading topics: "We don't have victories anymore. We used to have victories, but we don't have them." Teacharg (2017) says, "This is the black and white fallacy … the presumption that only two possible states exist; in this case, it is having victories or not."

Who wins? The Chinese, Japanese, Mexicans … The show goes on. According to Teacharg (2017), Trump produces the following fallacies:

- The loaded question fallacy (Trump: "When's the last time we beat China?")
- The anecdotal fallacy (Trump: "I always beat China." Teacharg: "The speaker is using a vague reference to a personal experience to make and validate his arguments.")
- The fallacy fallacy (Teacharg: "The assumption that because a claim is poorly argued because it is a logical fallacy then it must be untrue." Trump has just asked another loaded question: "When was the last time you saw a Chevrolet in Tokyo?" Teacharg explains that since Chevrolet sold very few cars in Japan the last two years, it is very likely that "the last time you saw a Chevrolet in Tokyo" was long ago. So, the US does not "beat" Japan in what concerns car sales. The question remains loaded and does not prove anything. The fallacy fallacy "is like a dream within a dream.")
- The straw man fallacy (Trump: "When do we beat Mexico at the border?" Teacharg: "A straw man argument is basically a misrepresentation of an argument that automatically makes that argument easier to attack." He explains that the "extremely complicated" question of immigration is introduced in an oversimplified way.)
- Appeal to emotions (Trump: "They are laughing at us, at our stupidity," "They are killing us economically." Teacharg: "This logical fallacy is basically a manipulation of pathos." "It seeks to manipulate the audience's feelings in place of a valid argument.")
- Slippery slope (After having said that the US has been "killed economically," Trump adds: "The US has become a dumping ground for everybody else's problems." Teacharg: "If we let X happen, then Y will happen, then Z will happen, then all these things will happen which will ultimately be awful."
- Circular reasoning (presented at the same time as an "appeal to emotions"). (A few people shout in the room. No intelligible word is uttered other than, perhaps, "Yyeeaaaah!"

Trump smiles, says a word of thanks, and goes on: "These are the best and the finest." Teacharg: "If you are cheering Trump, then you are the best and the finest… Who says so? Trump does … How do we call that? Circular reasoning… He is chasing his tail… That is another logical fallacy.")
- Black and white (again) (Trump says that Mexico sends its people but "they are not sending their best, they are not sending you, they are not sending you" [while pointing at different people in the audience]). Teacharg: "They are not sending their best, they are not sending you, so they must be sending the worst… drug dealers and rapists and no one in between … And the straw man that Mexico, as a nation, is actually selecting individuals to send to us, persists here.")
- Appeal to authority (Trump describes the awful people sent by Mexico. "I speak to border guards and they tell us what we're getting.")
- Genetic fallacy (Teacharg: "[This is] the judgment of something as good or bad simply based on the source of that thing. He is casting all Mexican immigrants who illegally cross the border in an incredibly negative light based solely on their country of origin.")
- Composition fallacy (Teacharg: "The assumption that what is true for some slice is true for the entire thing." Teacharg explains that Mexico has an issue with drugs and organized crime, but this does not apply to every Mexican who crosses the border. "It is also part of what makes generalizations about things like race stupid, completely logically unsound.")
- Common sense fallacy (Trump goes on to repeat twice: "It only makes common sense." Teacharg: "Claiming that something is so obvious or so easy to understand that even a child should be able to understand it, that is a rhetorical trick that is known as the common sense fallacy.")
- Black and white fallacy (again) (This time it is about the sharp division between some rare good Mexican people and the many bad ones … that Mexico would choose to "send" to the US.)

> - Personal incredulity fallacy (Trump: "It is coming from more than Mexico, it's coming from all over South and Latin America, and it's coming probably, probably, from the Middle East. But we don't know, because we have no protection, and we have no competence; we don't know what's happening." Teacharg: This fallacy "is basically the use of [one's] ignorance to take down a claim … I am incredulous of this thing, and so there is no way it can be true." Trump uses a variant—"we don't know, we have no protection and no competence"—that would be sufficient "to attack the argument that we, as Americans, are safe, that the US government has taken appropriate and effective actions to curb terrorism that may otherwise stem from the Middle East."

Teacharg (2017) takes stock and announces "more than fifteen kinds of logical fallacies, some of which were used multiple times, in literally the span of three minutes," referring to the event as a "festival of fallacies." However, it is also clear that his concept of fallacy, of "logical fallacy"—the expression he constantly uses—is broad and vague. Regardless of intention, any rhetorical trick counts as a fallacy. Moreover, most of the fallacies he pinned down are not premises-conclusion arguments explicitly uttered by Trump: he often interprets mere statements as fallacies. The opening bandwagon fallacy, for instance, is only based on Trump's exclamation and comment on the number of people in the audience, and this could be seen as an unfair interpretation or a misleading reconstruction. Trump's "appeal to emotion" is not an argument but rather, as Teacharg (2017) himself puts it, a trick used "in place of a valid argument." The 'common sense fallacy' is just a claim; "a rhetorical trick." Thus, the meaning of 'fallacy,' which was first defined as a 'fallacious argument,' is expanded to the lay definition that a fallacy is any form of sophistry or lie. (Did Trump really "speak to the guard"?) This has unsurprising consequences for the frequency of fallacies. You could here reasonably wonder, like Finocchiaro (2005), whether these fallacies exist beyond the mind of the interpreter. This does not excuse Trump's many insinuations and innuendos, but you may often wonder where exactly "the error of reasoning […] making the argument

automatically illegitimate" is hidden. Where is the "hole in the reasoning"? At the very beginning of the video, Teacharg (2017) explained that Trump is a "pop culture icon" not a trained politician. So, he "finds himself hard-pressed to piece together a sound political argument" but "very effectively uses language to his advantage," as shown by his political success. How is it possible that such a gifted speaker makes so many "errors of reasoning"? Does he make "errors of reasoning"? This goes back to a previous question: should intentionally fallacious moves be taken into account in an inquiry into the frequency of fallacies? It seems likely that, most of the time if not always, Trump knows what he does and the effect of what he does: his fallacies are closer to a sophist's tricks than to the fallacy of a beginner. Furthermore, he addresses an audience that is already converted. He does not need the arguments reconstructed by the commentator, he just has to say what his supporters want to hear. So, an interpretation *à la* Finocchiarro sounds reasonable here: the fallacies, understood as fallacious arguments, could be in the logician's head.

Thus, the impressive frequency of fallacies claimed by Teacharg could be largely overstated. About this kind of exaggeration, it is interesting to note that you can easily find similar videos on the same internet platform or elsewhere boasting of their detection of impressive rates of fallacies: 14 logical fallacies in 14 minutes (but not from the same discourse) (Arnall 2023) and 31 logical fallacies in 8 min (Bearup 2023)! In this last video, the commentator has the most radical claim about the frequency of fallacies: "We use them all the time." Is there a US contest about the highest rate of fallacies? Is there a fallacy business? But even if Teacharg's non-academic investigation is not very convincing in terms of the frequency of fallacies during the three opening minutes of Trump's discourse, this is not evidence that fallacies are not frequent.

3.3.2 The Kok-Stekelenburg debate

The second example is a study, published by E. C. Krabbe (1993). It is more academic than the previous one, but they share many methodological aspects. First, it is the observation of a political discourse: here, a dialogue between two Dutch politicians, the

Vice-Premier Kok and the union leader Stekelenburg. Second, it proceeds by counting the utterances of fallacies over a limited span of time. Only parts of the dialogue are selected and reported here, but the final result is again a fairly high temporal frequency: 26 fallacies for a 50 minute-dialogue—that is to say, an average of about one fallacy per two minutes. Although this rate is less impressive than in the previous case, it can still be said to be high.

The theoretical orientation, however, is different, for Krabbe's study subscribes to some basic tenets of pragma-dialectics, including the definition of fallacy. Thus, starting from this normative approach of the critical resolution of a conflict of opinion, Krabbe writes:

> Ideally, both sides are to present rational arguments and, if all goes well, one party will, in the end, find itself convinced by the other party. This means that a debate can be viewed as a critical discussion and that it can be judged by standards which apply to critical discussion, i.e. logical and dialectical standards. Whenever people complain about the fallacies and tricks in a debate, this is exactly what they do (1993, p. 82).

Krabbe gives the following definition: "A fallacy, in a critical discussion, is a move that obstructs the dialectical process, a move that makes it harder to reach the goal: conflict resolution" (1993, p. 83).

This is the general orientation of this study. Yet, fallacies are put in the more specific theoretical frame developed by Krabbe and Walton (1995), namely the existence of six basic normative types of dialogues, critical discussion being only one of them. This has a direct consequence for the question of the frequency of fallacies given that,

> Each of these main types [of dialogue] brings its own norms into play. Actions that would be objectionable from the perspective of one type of dialogue may be entirely proper if judged by the norms of another type. For instance, what constitutes a fallacy if we stick to the norms of critical discussion, could be a proper move in a negotiation procedure, or fair play in an eristic contest (Krabbe 1993, p. 83).

This situation is likely to occur in the Kok-Stekelenburg dialogue where Krabbe (1993) identifies "at least four main types" of dialogues and stresses that "as a mixed dialogue that is continually wavering between its various dimensions, it is full of shifts" (p. 95). Shifts from one type of dialogue to another matter because they "often lead to fallacies being committed." Yet, a theoretical point is not very clear, namely whether it is shifting that leads to fallacies or fallacies that are signs of a shift away from critical discussion. Yet, this theoretical problem is not essential to the question of the frequency of fallacies, with one of Krabbe's main conclusions being that his study shows that a persuasion dialogue can continue despite many fallacies.

In accordance with his theoretical approach, Krabbe (1993) takes into account what he identifies as 'classical' fallacies (straw man, *ad verecundiam*, many questions, etc.) and also moves interpreted as rhetorical or dialectical mistakes (changing the subject, evading the burden of proof, etc.). Krabbe also stresses that "each debater has his favorite type of fallacy" (1993, p. 99). This may be an interesting avenue for psychologists to explore, but Krabbe does not link this tendency to personal psychological aspects but rather to the political position of each participant: the vice-premier is prone to *ad verecundiam* arguments whereas the union leader prefers *ad baculum*.

Finally, these two empirical studies have the merit of emphasizing that even on the basis of rather different definitions of fallacies, if the definition of 'frequent' is not too strict, people may produce fallacies very often. Yet, this kind of observational study has a specific drawback: its sample is not randomly chosen. Both studies were not designed to answer our general question. So, to use them as empirical evidence of the frequency of fallacies is to ask of them more than they can give, partly because their time span is limited contrary to the general claim that fallacies are frequent. Yet, some proponents of the frequency thesis may take them as sufficient evidence.

Moreover, both studies may face another objection that has already been suggested, namely that the frequency of fallacies is field-dependent. This was a core point in a debate between Marie

Secor and Gary Jason on whether fallacies are common (Jason 1987, 1989; Secor 1987). To answer this question, Jason deliberately avoided situations where people typically do not use arguments (and so where fallacies rarely occur, unless, perhaps, if you compare their rate of occurrence to the number of arguments used). Thus, he looked for fields where people are likely to argue and finally chose two political debates that supported his conclusion that fallacies are common. His choice may seem *ad hoc*, and the way he presents his results[4] illustrates the importance of a comparison of relative frequency rather than an isolated statement of a numerical frequency. Without such a comparison, confusion or equivocation can easily occur. For example, in a field or situation where arguments are rare, one can rightly conclude that fallacious argument are rare too, hence not frequent. On the other hand, if all or almost all of these rare arguments are fallacious, some people could also conclude that fallacies are frequent.

Secor's (1987) reply aimed at another point. She objected that some of the fallacies stressed by Jason were not fallacies and argued that political debates are not good examples because political discourse is a field that, according to Toulmin's concept of field-dependent arguments, has specific requirements and constraints. Hence, according to Secor, it is no surprise that more (or less) fallacies are found in some fields when applying evaluative criteria that do not take specific practical features into account. It can be said that if the fallaciousness of some arguments is field-dependent or dialogue type-dependent—like in Krabbe's (1993) theory—any answer to the problem of the frequency of fallacies based on empirical studies made without considering the specificities of the field amounts to a *secundum quid* fallacy, namely an induction from qualified cases to a *simpliciter* (i.e., unqualified) statement.[5]

3.3 *Experiments in the psychology of reasoning*

[4] "In both the debates examined, roughly forty to fifty standard fallacies are discernible." (Jason 1987, p. 91)

[5] It is sometimes said that the interpretation of the *secundum quid* fallacy as a case of hasty generalization is rooted in A. De Morgan's chapter on fallacies in *Formal Logic* (1847/2003). For a discussion, see chapter 18 in Woods (2004).

This paper has already raised the question of how Govier and other proponents of frequency determine that fallacies are frequent. Part of the answer lies in providing the kind of non-systematic informal familiar support mentioned by Johnson (1995). In a note where Govier compares her definition with others that either do not mention frequency or only speak of a 'tendency' to deceive, she turns to Nisbett and Ross' (1980) book, *Human Inference*, which provides "empirical evidence that people commit a variety of inductive fallacies" (Govier 1987, p. 200). Strictly speaking, this remark is not a comment about the frequency of inductive fallacies, but only about mistaken inductive reasonings. This says nothing about the frequency of deductive fallacies and does not mean that deductive fallacies based on circular reasoning, affirming the consequent, or denying the antecedent are not frequent in the broad sense of being widespread. Johnson (1995) too uses experimental psychology studies to support the development of a new fallacy theory to be used as a critical tool for the analysis of arguments. Once again, he first answers Finocchiaro's claim that "fallacies exist only in the mind of the interpreter" (1995, p. 114) by appealing to the personal experience of "anyone who has spent any amount of time analyzing ordinary responses to reasoning" (Johnson 1995, p. 114). But beyond this informal support, he also puts forward research in cognitive psychology on common mistaken inductive reasoning, especially Nisbett and Ross' works. Govier and Johnson's point is that some of these mistaken reasonings correspond to some types of inductive fallacies, which may be used as empirical support for claiming that fallacies are frequent or as a counter-argument to Finocchiaro's claim.[6]

The psychology of reasoning is a blossoming field of research, too large to be extensively discussed here. Yet this paper provides several points that should temper Govier and Johnson's hope to find convincing support in this field for the position that fallacies are frequent or frequent enough to deserve a name.

It should be noted that most of the experimental psychology works referenced to support the frequentists' view do not explicit-

[6] I owe this exact formulation to a reviewer, whom I thank. Yet, I feel uncomfortable with the vagueness of the term "correspond ."

ly bear on fallacies but, more generally, on bad or mistaken reasoning. The point is not that Nisbet and Ross provide no empirical support for the banality of weak inductive reasonings. On the contrary, they provide one of the numerous studies that have shown that many people have trouble with inductive notions, especially those bound to probability calculus, such as the representativity of samples, covariation, or predictions. They also stress several common flaws, like the vividness bias or the confirmation bias. The problem is determining whether a mere correspondence or resemblance between these weaknesses and some inductive fallacies will suffice to bridge the gap between common mistaken reasoning and fallacies. This is one case where the very definition of 'fallacy' matters a lot for the question of frequency. Unsurprisingly, frequentists' definitions find a correspondence, if not an identification, between some of these common mistakes and fallacies, for instance, hasty generalization or *non causa pro causa*. Hence common mistakes become frequent fallacies in a sense.

There are at least two striking differences between a test and the kind of observational studies previously discussed. First, what is typical of this kind of test is that the would-be fallacies are not picked up in a speech or dialogue, they are not recorded *ex post facto*, but are made possible, if not stimulated, through an interaction between the subject and the experimenter. Thus, the would-be fallacious utterance is not independent of the experimenter: it is a reaction to stimuli (typically questions or challenges), just like in the case of the tricks of the sophists of antiquity. Second, this kind of test is typically not interested in any kind of fallacy but focuses on a single aspect that corresponds to one or, at most, a few related ones.[7] Do not expect the variety of what Teacharg (2017) called Trump's "festival of fallacies." In one case, frequency is the number of fallacies that occur during some time; in the other, it is the

[7] This was the case during the last decades of the 20th century, when the frequency thesis appeared: psychology studies focused mostly on bad reasoning or errors of reasoning. More recent psychology studies (typically after 2000) explicitly rely on fallacies, although a clear distinction between bad reasoning or errors of reasoning and fallacies is not always made. For an overview see, for instance, Ricco (2007).

rate of members of a population who make a mistake or a kind of mistake.

This is the case with some of the most celebrated and discussed initial psychological studies on human reasoning, like Wason's (1968) selection test and the studies it inspired or the 'heuristic and bias' approach of Kahneman and Tversky that explicitly inspired Nisbett and Ross' work referred to by Govier (1987) and Johnson (1995). Wason (1968), for instance, did not aim at a mere study of some fallacies and their frequency. His experiments that showed subjects' difficulty with contrapositive inferences and their tendency to indulge in mistakes associated with fallacies like denying the antecedent or affirming the consequent were intended to confute Piaget's (1975) idea of a stage of formal thought commonly reached by adult human beings.

The significant rates of mistakes (more than 50%) found by these studies support the views of those who claimed, like Mill (1872), that human beings are prone to mistaken reasoning, inductive as well as deductive. Hence there are some doubts about the generality of human rationality: in contrast to the rationalistic optimism about widespread qualified rationality, these empirical studies call for a modest acceptance of the fact that some people perform rather badly. Bad or weak reasoning is the rule, and brilliant reasoning is either the exception or requires serious effort. In a way, this coincides with the EAUI interpretation of fallacies (error, attractive, universal, and incorrigible) introduced by Woods (2013) or, in a different style, to the logical sins of Port-Royal.

Now, the frequency of fallacies is not even in need of empirical evidence if it is built into the very concept of fallacy but beware of the circle (or confirmation bias). When Johnson writes: "We should introduce the notion of frequency [into the definition of fallacy]; because a fallacy is not just any mistake in argument, but one that occurs with some frequency," (1995, p. 116) this definition ensures a fit between his new concept of fallacy and mistakes of reasoning frequent enough to deserve to be baptized. Yet, the support drawn from experimental psychology is far from being univocal and uncontroversial. Different kinds of objections or counter-experiments have been addressed to the most radical conclusions about the generality of poor human reasoning.

In the case of Wason's (1968) selection test, for instance, it was quickly shown that the very formulation of the task influences the overall result. In some cases, a different formulation of the task leads to a sharp decrease in the rate of reasoning that could be seen as fallacious (Evans 1972; Evans and Lynch 1973). Other experiments by Wason himself (Wason and Shapiro 1971) and others (Johnson-Laird et al. 1972) also showed rates of bad reasoning that were highly dependent on the core topic of the experiment: subjects made fewer mistakes when the relation expressed by the conditional proposition involved familiar situations rather than the more abstract and arbitrary relation fixed between letters and numbers in Wason's original experiment. So, although the "conversion" of a relation of consequence has been a paralogism since Aristotle and the hypothetical forms of affirming the consequent and denying the antecedent have been identified as non-conclusive at least since Galenus (Kieffer 2020), contemporary experimental psychology does not confirm a non-contextual general disposition to these forms of bad reasoning. Although they are frequent, in the sense of being widespread, they also depend on contextual factors. This is one more reason to be careful with the statement of a single frequency and to look for comparisons between relevant frequencies. Context dependency only shows that the frequency of a kind of bad reasoning increases in some cases and decreases in others. As long as no quantitative threshold is fixed, we are left with the vagueness of 'frequent.' For instance, one could say that since 'fallacy' is a pejorative term, fallacies should be avoided and that even at a rate of, say, 5%, means they are (too) frequent.

Nisbett and Ross report that critics objected that their pessimistic results about human reasoning are, in several senses, "limited to the laboratory" (1980, p. 251). According to critics, the very principle and method of their experiments were biased and so they said that "the investigators are trying to pass off a few puckish demonstrations as a faithful portrait of human inferential capacity" (1980, p. 251). This criticism is rooted in one of the methodological differences this paper has emphasized between this kind of experiment and observational studies of (more or less) spontaneous fallacies committed by people. The subjects of our observational studies were not laypeople but politicians trained in the

public use of speech—a good reason to doubt the spontaneity of some of their fallacies. It is also worth noting that the objection that the empirical results are, in some way, "limited to the laboratory" belongs, like Finocchiaro's doubts on the frequency of fallacies, to a wide category of criticisms suspecting an artifact distorting the evaluation. Another important example of this kind of methodological objection follows.

Nisbett and Ross (1980) reply that although they grant that in some contexts—especially scientific ones—human beings can fare rather well, the weaknesses of reasoning reported in their study are not exaggerated but, on the contrary, underestimated. They deny the objection that their subjects performed rather badly because they were not really motivated, not seriously involved in the experiments, or did not really pay attention to the task. Nisbett and Ross argue, instead, that their subjects were actually highly motivated. In any case, this unsurprisingly emphasizes that motivation matters.

Wason's (1968) selection test has inspired and still inspires much research. Keeping in mind that if the hypothesis of the frequency of fallacies means that each kind of fallacy is frequent, a preliminary question is: "Do these works supply an answer to the frequency of affirming the consequent and/or denying the antecedent? In some sense, they did at least confirm the ancient informal familiar view that many people can be easily confused by conditional statements. But this does not entail that people often make these fallacies. The question guiding this paper is perhaps too general to get a direct answer from complex empirical reality. This may still be true for broad categories of fallacies, like affirming the consequent that may wrongly be applied to cases where people were actually looking for an explanation, as suggested by Socher (2001) or Harris (2002). Here again, this does not entail that this mistake is not frequent[8] but only that it is less frequent as a fallacious argument than it seemed at first sight. Moreover, Ricco (2018) reveals inconsistencies in the empirical findings about human ability to reason deductively.

[8] See, for instance, Christoforides et al. (2016) and Imaï et al. (2021) for discussions of frequent issues with conditional reasoning.

The case of inductive reasoning is not very different. Here again, most studies do not explicitly focus on the traditional concept of fallacies with its idea of a twin interpretation of the argument. More typically, they consider inductive mistakes of reasoning, especially from the perspective that takes the mathematical theory of probability as a norm. Some of the most well-known studies pay attention to what has been dubbed 'cognitive illusions.'

L. J. Cohen has been one of, if not the most, constant and systematic challenger of Kahneman and Tversky's (1973, 1974) pessimistic conclusions about the intuitive judgments of laypeople on inductive matters and probability. His attitude is more charitable toward the common attitude of the subjects who underwent their tests and one of his statements is analogous with Finocchiaro's view on the frequency of fallacies in ordinary discourse. He grants that human beings are prone to various kinds of illusion and mistakes, but he also writes about Tversky and Kahneman that "it seems more likely that the fallacy has been in the experimenters' interpretations of their data, rather than in the minds of the experimental subjects" (Cohen 1979, p. 385). The worst-case scenario would be that the evidence provided by empirical tests supporting the views of frequentist logicians is first primarily rooted in the fantasies of imaginative experimenters.

According to Cohen (1979, 1981, 1982), the theoretical expectations of experimenters and the subjects' actual understanding do not match. In some cases, the fallacies wrongly attributed to subjects are the result of confusion on the part of experimenters. In the study of inductive reasoning, experimenters underscore the deviance of the answers from the standard mathematical concept of probability ("Pascalian" probability in Cohen's words). But they did not deviate from the standard that Cohen (1977) calls "Baconian," which is quite common and rational, especially in legal reasoning and in some scientific inquiries, despite being divorced from some principles of Pascalian probability. So, instead of a "Norm Extraction Method" (Cohen 1982) that, in essence, attempts to discover the norms that are followed by most subjects when their reasoning about uncertain matters is not disturbed by accidental or systematic perturbations, Tversky and Kahneman

apply a "Preconceived Norm Method." It presumes that a single norm rules the subjects' reasoning and the experiment is designed to check whether people follow it. In opposition to Cohen's view, Tversky and Kaheman (1979) put forward the numerous experimental successes of Pascalian probability. Cohen replies that it succeeds only when it can be applied. Although this controversy does not fall within the scope of this paper, here is part of Cohen's conclusion in his well-known article that denounces the very project of experimental demonstration of human irrationality: "At best, experimenters in this area may hope to discover revealing patterns of illusion. Often they will only be testing subject's intelligence or education. At worst they risk imputing fallacies where none exist" (1981/2008, p. 152).

A similar criticism has been developed by Gerd Gigerenzer (1991, 2007) who shares Cohen's (relative) trust in common sense. Gigerenzer agrees that Tversky and Kahneman misapply the concept of probability, but not in the way described by Cohen: the "errors" identified by the heuristic and bias approach are not errors. While Cohen calls on an alternative concept of probability—his Baconian probability—Gigerenzer argues that Tversky and Kahneman fail to heed basic distinctions in classical (i.e., "Pascalian") probability theory. What they consider to be the correct normative view leads them to the wrong assumption that probability theory speaks with only one voice and gives a single correct answer to problems. According to Gigerenzer, they do not "compare apples with apples" (1991, p. 88). So, like in some criticisms addressed to the interpretation of Wason's selection task, Gigerenzer's defense of the alleged "errors" of the subjects of the experiments turns into a charge against the very construction and/or the formulation of the problem they are asked to solve. The fundamental distinction overlooked by Tversky and Kahneman would simply be the one between the confidence put into a single event and relative frequencies—a notion that only makes sense in the long run. So, Tversky and Kahneman deal with problems of subjective confidence with concepts and methods that are only relevant in the context of the relative frequency approach of statistics. Gigerenzer (1991) provides evidence for his view by showing that the alleged "cognitive illusion" disappears when subjects are submitted to

problems rephrased in terms of relative frequency. This does not mean that people never make reasoning mistakes, but when Tversky and Kahneman "claim to have identified 'errors', it would be foolish to label these judgments 'fallacies'" (Gigerenzer 1991, p. 95).

This brief overview shows that the support that experimental psychology provides for the thesis that fallacies are frequent is rather mitigated. Most of the work done in this field often explicitly bears on mistakes of reasoning rather than on fallacies, so the extrapolation from one field to the other will be highly sensitive to the very definition of fallacy. Moreover, when they bear on fallacies, they bear on some fallacies, not on fallacies in general. Some are left aside and the conclusions about the few that are concerned are sometimes controversial.

Finally, if we summarize the weight of the three kinds of empirical support previously discussed, the thesis that fallacies are frequent is far from being empirically settled. Most people who experimentally study human reasoning agree that it is fragile and can easily be mistaken for various reasons. They also easily grant that in some places or times, some kinds of bad or seemingly bad arguments are likely to occur. But there is no consensus that they should systematically be considered fallacies. Hence the frequency thesis is weakened because what appears to be a failure of reasoning is often a context-dependent illusion or a mere artifact. The overall support provided to the frequency thesis by the three sources opens interesting avenues for further investigations but remains relative and open to criticism.

4. Conclusion

Although the thesis that human beings are prone to mistakes of reasoning has been claimed since at least the 17th century and was often bound to moral or anthropological considerations, the two claims that fallacies are frequent and that frequency is essential to the very idea of fallacy appeared only a few decades ago. This happened in the context of a reshaping or revision of traditional definitions of fallacies by some argumentation theorists. Ancient definitions and some contemporary ones are silent on the topic of

the frequency of fallacies, and at most they suggest that it is a contingent matter although the extension of human weaknesses to the field of reasoning has been claimed for centuries.

Today, it seems difficult to defend the frequency thesis by means other than empirical support. Despite its diversity, this support spanning from personal informal familiar experience to regimented psychological tests or the report of a distant observation of speakers in action, does not allow an uncontroversial single convincing answer to the general question of the frequency of fallacies. Beyond the lasting issues of what counts as a fallacy and when a fallacy can be said to have been committed, a careful empirical consensus seems possible for a relative frequency of some fallacies. But it requires more systematic and rigorous empirical studies that take into account or make clear their position on the critical points outlined in this article. From a more theoretical point of view, the very definition of fallacy should leave aside any vague frequency condition that could become an obstacle to the study of their relations with the weaknesses of human reasoning.

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