The Scope of Logic

The extent to which we allow for subjective evaluations in logic affects what we take to be the scope of logic.

In this paper I wish to contrast two views of logic. One is that logic is an objective science: no subjective criteria have a place in logical analyses. The other is that logic is the art of reasoning well, where subjective criteria are essential in many of the analyses. These different conceptions of logic affect what we take to be the scope of logic.

I will not try to trace the history of these views nor classify logicians into one or the other camp. My goal here is to present the contrast as starkly as possible, citing only Gödel and Frege as representatives of those who take logic to be an objective science, whom I call *objectivists*, and myself as representative of those who take logic to be the art of reasoning well.

To see the contrast, we need to have a clear idea of what we mean by "subjective" and "objective." That depends on how we conceive of propositions.

Propositions

All logicians are concerned with what is true and what follows from what. They usually call those things that are or can be true *propositions*.

Objectivist views of propositions

Gödel is a platonist. He says that propositions are abstract things that we cannot perceive through any of our bodily senses: not taste, not

sight, not sound, not touch, not smell. They exist whether we perceive them or not, just as stars exist that no telescope has ever seen or will ever see. They are true or false regardless of what we may believe about them. We have access to them through our intellect. Their independence of us grounds our study of logic apart from our mental lives.

Gottlob Frege was explicit in ruling out anything psychological from logic. He takes propositions to be thoughts that are somehow universally held or at least accessible to all of us. Though that might seem to characterize the basis of logic in terms of our mental lives, Frege is clear that these thoughts are not ones held by just one person but are somehow supra-personal, and their connection to the world is fixed independently of our beliefs, feelings, wants, or what we think. Thoughts in this sense are as abstract as the propositions of Gödel.

However, one need not be a realist to view logic as the art of reasoning well. One could say that propositions are linguistic, either a certain kind of sentence in our ordinary language or a formula of some formal language. Though linguistic, and hence produced by us, the relation of propositions to each other and to the world is said to be independent of us, a relation between what we say and what there is, fixed without regard to our mental lives. Logic is not about abstract truths but is meant to catalogue or characterize the most general truths of the world which are expressed in language.[1]

Propositions for logic as the art of reasoning well

In my work I take logic to be the art of reasoning well.[2] I typically use a different term than "proposition" in discussing what is true or false.[3]

> A *claim* is a written or uttered piece of language that we agree to view as being either true or false.

The agreement need not be explicit, perhaps noted only because we don't disagree.

This definition of "claim" can be used by objectivists because it is left open why we agree whether a particular piece of language is a claim or why we might take a class of sentences of a formal language to be claims. It may be due to our biology. It may be due to our culture. It may due to a stipulation we make. It may be due to the gods directing us to agree. It may be due to our dimly perceiving that a sentence such as "Ralph is a dog" represents or "expresses" an abstract

proposition. A claim, a realist might say, is just how we direct our attention to a proposition.

Language is used by all logicians
A platonist, someone who takes propositions to be supra-human thoughts, someone who takes linguistic expressions whose relation to the world is fixed independently of us, someone who takes propositions to be claims, even someone like L.E.J. Brouwer who thinks that propositions really are thoughts, all of us use language to communicate, to discuss and further our studies in logic. So in what follows, I will look at sentences as either being propositions or in some way representing propositions.

The objective-subjective distinction

In "Subjective Claims" Fred Kroon, William S. Robinson, and I show that none of the usual defintions of "subjective" and "objective" are useful in classifying claims/propositions according to the role they play in both our mental lives and our reasoning. So we set out a linguistic standard:

> A *simple subjective claim* is a claim that is or is equivalent to one in the form:
>
> > [Someone, or some people, or some thing(s)] thinks/believes/feels/wants . . . .
>
> A claim is *subjective* if it is a simple subjective claim or a simple subjective claim is used as part of it. A claim is *objective* if it is not subjectiv e.
>
> *Subjective criteria* are those that contain at least one subjective condition set out as a claim. All other criteria are *objective*.

These definitions can serve an objectivist, too, who could say that the form of the proposition is what is picked out by the form of the utterance or inscription.

Are subjective claims a proper subject of study of logic?

Objectivists wish to make logic a science that uses entirely objective criteria. In that case, it would seem that an investigation of theories in psychology would be outside the scope of logic. The work of the logician would be of no import in analyzing an inference such as:

Henrique smells a dog.
Therefore, Henrique smells something.

The criteria for the proposition (represented by) "Henrique smells a dog" to be true are subejctive—unless one were to take psychology and all subjective claims to be reducible to objective ones. Some say that is possible: we could correlate subjective claims to objective claims about brain states.[4] But that "could" is never made clear enough to be more than an assertion of faith, so for an objectivist, at least so far, subjective claims would seem to be outside the scope of logic. In contrast, in logic as the art of reasoning well this inference would be a suitable object of study since subjective criteria are not excluded.

However, the objectivist and the practitioner of logic as the art of reasoning well agree that the job of the logician is not to decide which *atomic* propositions/claims, that is, the simplest ones we deal with in our analyses, are true or false. That is to be decided by the engineer, the physicist, the lawyer, the mechanic, the psychologist, the hair-dresser, perhaps even, as in the inference above, a person reflecting on his own sensations. Given that certain atomic propositions are true and others are false, or that some could be true and others false, the logician begins his or her studies. So, it seems, an objectivist could consider atomic subjective claims so long as nothing else subjective enters into logic: no subjective evaluations, no judgment. All of logic would use only objective criteria except for, possibly, the truth-conditions of atomic claims. Theories in psychology need not be outside the scope of logic as an objective science.

Logic as an objective science

For the objectivist, logic is about propositions and objective relations among propositions independent of what anyone thinks, believes, feels, or wants. No subjective evaluations, no judgment is part of logic.

Yes, judgment may enter into deciding whether two sentences such as "Ralph is a dog" and "Ralph is a domestic canine" both point to the same proposition. Judgment may enter into figuring out whether a particular sentence points to a proposition with this form or that form. But those judgments and evaluations are not part of logic; they are our groping to see the truths of logic. For an objectivist, logic is about truths of relations among propositions and truths about propositions based on their form. Whether those are truths about abstract objects or

the most general truths of the universe including our experience, they are independent of our thoughts, beliefs, feelings, or wants.

So consider the propositions (expressed by the sentences):

Ralph is a dog.

Ralph barks.

These are true or false; indeed, they are objective.[5] It doesn't matter to us as logicians how we might know whether they are true or false. These sentences are or point to objects of study for logic.

Now consider:

(1) If Ralph is a dog, then Ralph barks.

What in the world independent of our mental lives makes this true or false?

The phrase "if . . . then . . ." has many different readings in English. The classical logician says that the conditional is true if and only if the antecedent is false or the consequent is true, which, relative to the truth of atomic claims, is an objective standard. Then restricting attention to only how propositions can be compounded using that reading of "if . . . then . . ." and readings of "and," "or," and "not" that also depend on only the truth-values of the constituent propositions in the compounds formed by those, he arrives at classical propositional logic.

We don't use "if . . . then . . ." that way very often. Still, that seems O.K. if we're interested in only whether the constituent propositions are true or false. But then it seems we're describing not just what makes propositions true or false, but properties of propositions. So what we consider propositions to be does matter.

No, it could be said, we are paying attention to how we do or can use our language only in order to investigate whether certain propositions are true or follow from others; truth and following from are objective, independent of us. Still, this seems very different from chemistry, where the theories are about the world and not about how we talk about the world. A language is chosen to talk about the world, but it itself is not under investigation.

Well, it might be said, chemical theories incorporate or are built on our logical analyses, so they do talk about propositions. It's just that decisions about what to pay attention to in our talk are held in the background, assumed as already long-settled.

Or it could be said that we are investigating not how we talk about the world but how propositions can be combined and related

independently of us, which we confusedly pick out with various phrases in English.

But then why should we focus on this way of interpreting "if . . . then . . ."? It's because we want to learn what is true or false about the world, what follows from what. That desire is not part of the theory, any more than a desire to be able to manipulate people is part of a psychological theory. We simply choose one way to interpret "if . . . then . . .", and the relation among propositions that it invokes is what determines whether a compound proposition such as (1) is true or false. Nothing subjective need enter into the criteria for the truth of compound claims or for the relations among propositions.

So consider:

(2) If Robin Hood had been German, then he would have spoken Armenian.

This is deemed true on the classical interpretation of the conditional since the antecedent is false. Yet we feel that's not right. Surely, we think, (2) is false.

But if logic is an objective science, it isn't whether we think that (2) is false: it's not our judgments that are determinate here. It has to be that in reality, against some objective standard, (2) is false. What is that standard?

It is one that takes account of more of the world than does classical propositional logic. In evaluating (2) we consider the truth-value of "if . . . then . . ." to depend in part on how the constituent propositions could be true or false.[6] To show why classical propositional logic incorrectly evaluates (2), why (2) is outside the scope of classical propositional logic, we take account of what was ignored in classical propositional logic. Possibilities, regardless of your notion of proposition, are on this understanding in the world and are not just how we conceive of the world. We said that "if . . . then . . ." is ambiguous, and this is another way to read it, one that amplifies the classical interpretation, requiring no subjective evaluations.

What then of:

(3) If the moon is made of green cheese, then 2 + 2 = 4.

On the classical interpretation, this is true. But some disagree, saying it's false because the antecedent has nothing in common with the consequent. They invoke some notion of subject matter or relevance in

their evaluation of conditionals. If those are properties of propositions independent of our judgments, then a system we build that takes account of those properties can be objective. If they are subjective, and our reason for rejecting (3) is subjective, then proponents of the view that logic is objective have to say that whatever system we build based on an interpretation of conditionals that takes such properties into account simply isn't logic. It might be classified as a way to amend classical propositional logic to make it more useful in our lives, part of the pragmatics of belief, but that is not logic.

The same issue arises with much of the rest of the traditional scope of logic, including arguments, causal inferences, and explanations. All of those take as central the following two notions:

> A claim (proposition) is *plausible* if we have good reason to believe it.
>
> An inference is *strong* if it is not impossible but it is very unlikely that the premises could be true and conclusion false.

For example, for arguments we have:

> An argument is *good* if and only if the premises give good reason to believe that the conclusion is true.
>
> Necessary conditions for an argument to be good are:
>
> > The premises are plausible.
> > The premises are more plausible than the conclusion.
> > The inference is valid or strong.

For an explanation to be good, the same criteria are necessary except that one of the premises must be not more plausible than the conclusion.

For the study of arguments and explanations to be understood as an objective science, it is essential that not only possibilities but probabilities—the likelihood of a proposition being true given a specific way the world could be—must be in the world completely independent of us. It doesn't matter that we can't easily or even perhaps ever determine them any more than it matters whether we can determine how many stars there are in the sky in order for us to say that "There are an even number of stars in the sky" is true or false independent of us.

If, on the other hand, the evaluation of a claim as plausible, of an inference as strong or weak, of an argument as good, or of an explanation as good depends on some subjective criteria, then the person who

holds that logic is an objective science will have to say that those parts of the traditional scope of logic are not logic. They are about giving rules for arriving at beliefs, perhaps a pragmatic expansion of logic, but not logic. The logician who conceives of logic as objective must either find many seemingly subjective standards to be really objective or else narrow the scope of logic considerably. It is, he or she will say, only a curiosity that those who study such subjects use many of the same methods that are used in logic as an objective science, a practice left to those practitioners to justify.

Some people have tried to give parts of the traditional scope of logic an objective basis.[7] Some take plausibility, or the strength of an argument, or the likelihood of a proposition being true, or good reason to believe all to be in the world, independent of any of our knowledge or judgments. But no one, so far as I know, has given a full development of the traditional scope of logic or even a very substantial part of it from an objectivist viewpoint.

If logic is an objective science, then whatever prescription there is to reason in accord with it must be outside the system, added to it. The system or systems describe the world correctly, so if we reason in accord with those we will (more likely) arrive at correct descriptions of the world. Hence, we should reason in accord with the system or systems so that we will (more likely) arrive at correct descriptions of the world.[8]

Logic as the art of reasoning well

Subjective criteria and evaluations are essential in logic as the art of reasoning well. Judgment cannot be extirpated from logic as an organon, a tool to arrive at beliefs we can use in our lives, beliefs we have good reason to believe.

Consider the definition of "claim." Perhaps we classify a claim as being true or false because of some dimly perceived intellectual apprehension that it picks out an abstract proposition. But more often in our reasoning the agreement to view a particular sentence such as "Spot's barking caused Dick to wake up" as a claim is relative to our purposes, our goals, and what we pay attention to. When Zoe says, "Spot's barking woke Dick" (she was up late working on her term paper when Spot started yelping), is that a claim? Tom could ask, "When did Spot begin to bark? When exactly did Dick awake? How long did Spot bark? How loud? What kind of yelping or howling or

growling or ferocious arfing was it?" "Oh, that doesn't matter," says Zoe, "you know very well what I mean." The language is not too vague, unless we need, for some reason, some purpose, more precision. Since no sentence of our ordinary language can be made completely precise, the question is only whether given the context we are justified as treating it as true or false.

Or consider the sentences:

Ralph is a dog.
Ralph is a domestic canine.

For the platonist the quesion is whether these represent or express the same proposition. In logic as the art of reasoning well we ask whether the sentences are equivalent for all our purposes. If we are restricting our attention to only the truth-conditions of atomic propositions in developing a propositional logic, we might classify these sentences as equivalent. If we are concerned also with how one might come to know whether these sentences are true or false, we will not classify them as equivalent. And even less would we classify them as equivalent if we are concerned with the subject matter of propositions. These are two distinct claims; they are not the same, but can be treated as the same relative to our purposes, including what we are paying attention to.

Platonists argue that taking claims as the basis of reasoning is hopeless. They say we cannot answer precisely the questions: What is a sentence? What constitutes a use of a sentence? When has a sentence been used assertively or even put forward for discussion? These, they say, can and should be avoided by taking things inflexible, rigid, timeless as propositions. But that only pushes back these problems to: How do we use logic? What is the relation of these theories of abstract objects to our arguments, discussions, and search for truth? How can we tell if this utterance expresses that abstract proposition? It's not that taking claims to be true or false brings up questions that can be avoided —if we wish to relate our work to our lives, to logic as a guide to reasoning well.

In argument analysis, too, we invoke subjective criteria. For example, Dick heard this morning that there are parakeets for sale at the mall. He knows that his neighbor has a birdcage in her garage, and he wonders if it will be big enough for one of those parakeets. He reasons:

All parakeets anyone I know has ever seen or heard or read about are under 50 cm tall.
Therefore, the parakeets on sale at the mall are under 50 cm tall.

The premise of the argument is plausible to Dick, and certainly more plausible than the conclusion. The inference is strong, for though Dick can imagine ways the premise could be true and conclusion false—perhaps a super-grow bird food has been formulated or a new breed of parakeet has been discovered in a remote jungle—those seem very unlikely to him. So Dick has good reason to believe that the parakeets at the mall are under 50 cm tall. Not perfect reason. Not reason based on objective probabilities. But reason that is good enough.

This makes logic seem quite personal, completely subjective. What is plausible to Dick may be implausible to Tom because of their different experiences, so what is a good argument for Dick is a bad one for Tom. If this were all there were to logic as the art of reasoning well, the accusation that it makes logic just a personal matter, a matter of psychology, would be accurate.

But we can and usually do arrive at subjective evaluations that we, or almost all of us, agree on. We evaluate an argument like the one above and come to some agreement about whether the premise is plausible and whether the inference is strong. We exchange our experiences by describing what we know. When we cannot agree, we investigate further; we do not simply say that the argument is good for Dick and bad for Tom. If Tom says that the argument is bad because he can imagine someone finding a 1 meter tall parakeet in the Amazon basin, we can criticize him for accepting as likely a possibility that is very unlikely. We can amd do develop *intersubjective* standards, relative to the assumptions we make in our reasoning, our goals, and what we are paying attention to that allow us to say that the argument is good, not just good for Dick.

But for those intersubjective standards to have any weight, to have any force of prescription for how to reason well, they must be based on more fundamental agreements about our reasoning. We choose what we will pay attention to in our experience: this kind of claim, this kind of reasoning, this part of the world. And we say on what basis we make the choice, which in the end goes back to our metaphysics. Then logic becomes not a description of how we do reason, not a psychological theory, but a prescription of how we should reason in accord with those

assumptions in order to arrive at beliefs that are justified—relative to those assumptions. We can say that the argument gives *us* good reason to believe the conclusion. We are not alone in the world.

An objectivist attempting to include argument analysis in the scope of logic would need to say that whether the argument above is strong is entirely an objective matter. What I have described is just our striving to find whether it is strong. Similarly, whether the premise is plausible would have to depend not on Dick's or our knowledge but on an objective standard of what counts as good reason to believe an unsupported proposition. So the argument is simply good or bad: nothing subjective enters into that. What is subjective is only our evaluation, our attempt to determine whether it is good or bad. But little good such objective standards would be for trying to decide whether we are justified in believing the conclusion. Such standards would serve only as a place we wish to arrive at in our deliberations, a place that, without our having any access to it, gives an objective basis for our agreements.

With logic as the art of reasoning well, we begin by trying to be as explicit as we can about what we are paying attention to in our experience. We try to be explicit about what we assume about language, people, and the world—our metaphysics. At the minimum we assume that there are people who talk and reason, and that some of their talk and reasoning is concerned with truth.

There are many choices for where to begin. We can say that we are concerned only with the truth-conditions of propositions and develop classical propositional logic. Then we can see how the analyses we develop there compare with those based on a more substantial metaphysics in which we pay attention to how we might come to know whether a proposition is true. We allow for many choices as the bases of our work in logic in order to compare how those affect the development of our systems. We allow for paying attention to more or less of the world of our experience, or as the platonist might say, of the world as it is independent of our experience. We do not say that there is only one right metaphysics to serve as the basis of all logic. We cannot justify with logic any metaphysics without appeal to another metaphysics to justify our logic. Perhaps there is just one right metaphysics which is revealed to those who are graced. But if so, that vision is outside the scope of logic. Perhaps such a metaphysics could be used as the sole basis for all logic. But some way to convince the

rest of us who have not had that vision that we should restrict our attention to only systems built on that will be difficult. Logic as the art of reasoning well is an art not only in that it allows for judgment in particular cases but also in the choice of vision of the world upon which those judgments are made.

Beliefs are justified relative to our knowledge and our abilities and limitations, which include the ability to imagine well. They are justified ultimately in relation to our basic assumptions, our metaphysics, which we try to make explicit in devising our analyses so that we can know the basis of our justifications. Though some part of our reasoning might be understood as having a completely objective basis, subjective evaluations enter into any application of that. Much of our reasoning, though, must be at best relative to what we know and believe, particularly the classification of a claim as plausible and of an inference as strong. Our goal is to arrive at beliefs we can justify. Such beliefs are more likely to help us understand the world, for they are beliefs that are not passive: they are linked to our abilities and our imagination. But they help us understand the world only relative to the template we hold up to it, our metaphysics, which in large part is encoded in our language.

I say "our" abilities, limitations, and imagination because together we pass from the subjective to the intersubjective. We may hope that our agreements are based on an objective reality, but our only approach to that is through our basic assumptions, our metaphysics. As we try to make those assumptions more explicit we begin to have confidence in our reasons for belief.

There may be a completely objective basis for justifying some of of our reasoning and our beliefs about the world. Perhaps that is the only basis for having good reason to believe. The rest of logic, then, is concerned with pretty good reason to believe, what we need in order to live and understand.

Come let us reason together.

Logic as the art of reasoning well is a part of philosophy, the love of wisdom. There is only one wisdom: how to live our lives well. A philosopher is a searcher, searching for a way to a good life for all of us. All else is a crying after need.

Others use logic as a bulwark against the mysteries. They build a wall within which reason reigns and live within the cities built of logic. I use logic as a way into the mysteries, using reason where I can to lead me to the boundary beyond which reason has no sway if we are to enter. Logic is the path, not the end.

There is no end but only a continual beginning.

Notes

1. (p. xxx) I do not consider here the view that logic is the science of the laws of thought. There is no evidence that would support such a science and much evidence that we do not think in accord with any logic.

2. (p. xxx) *Propositional Logics*, *Predicate Logic*, *Classical Mathematical Logic*, *Five Ways of Saying "Therefore"*, *Critical Thinking*, and this series of books of essays *Logic as the Art of Reasoning Well.*

3. (p. xxx) This conception of proposition or claim is developed in "Truth and Reasoning" and "Why Are There So Many Logics?" in this volume.

4. (p. xxx) Kroon, Robinson, and I discuss this in our "Subjective Claims."

5. (p. xxx) Ralph is here with me in my office.

6. (p. xxx) See "Conditionals" in *Cause and Effect, Conditionals, Explanations* in this series of books.

7. (p. xxx) I surveys some of that work in *Cause and Effect, Conditionals, Explanations*, in *The Fundamentals of Argument Analysis*, and in *Prescriptive Reasoning*.

8. (p. xxx) At one time I thought that the divide in conceptions of logic was whether logic is to be understood as descriptive or as prescriptive. But, as I show in "Prescriptive Theories?", there seems to be no clear way to distinguish between theories that are descriptive and those that are prescriptive.