

Chapter 2

Paradox and Context

2.1. Introduction

In the next three chapters, I shall work towards a new, general resolution of the semantic paradoxes -- what I'll call a *singularity solution*. As I stressed in Chapter 1, we should keep it firmly in mind that semantic paradoxes are generated by our everyday semantic notions. We are after an account of these ordinary notions -- an account of our notions of reference, predicate-extension, and truth. The problem is not primarily a formal or technical one: we are concerned first and foremost with natural languages like English, not with regimented formal languages. Accordingly, we should attend to our ordinary uses of terms like 'denotes', 'extension' and 'true' - in particular, to the reasoning we conduct with these terms. Now, as I mentioned in Chapter 1, it is well-known that there are strengthened versions of the Liar, and I believe that a careful examination of the associated strengthened reasoning throws light on our concept of truth.¹ Strengthened reasoning involving 'denotes' and 'extension' has received little or no attention, but this kind of reasoning promises to illuminate our concepts of denotation and extension, just as it illuminates truth.

The singularity solution makes two main claims: first, that the expressions 'denotes', 'extension' and 'true' are *context-sensitive* expressions, and second, that these expressions apply everywhere, except for certain singular points or *singularities*. The task of this chapter is to defend the first claim about context-sensitivity; I turn to singularities in the next two chapters. The three simple paradoxes I introduced in Chapter 1 provide the focus for both this chapter and

the next two. Then in Chapter 5, the main ideas of the singularity solution are applied to the traditional paradoxes of definability, and various forms of the Russell and the Liar.

2.2. Repetition, Rehabilitation, Iteration

So my aim in this chapter is to show that the expressions ‘denotes’, ‘extension’ and ‘true’ are context-sensitive. Let’s start out with a simple paradox of denotation. Consider the following case. I’ve just passed by a colleague’s office, and I see denoting phrases on the board there. That puts me in the mood to write denoting phrases of my own. So I enter a classroom, and write on the board there the following expressions:

pi

six

the sum of the numbers denoted by expressions on the board in room 213.

Now I believe that room 213 is my colleague’s office; in fact, I am in room 213. I set you the task of providing the denotations of these expressions. You respond as follows:

But we’re in room 213! It’s clear what the first two phrases denote. But what about the third? Let’s call your third phrase C. Suppose C denotes the number k. Now, C denotes k if and only if the sum of the numbers denoted by expressions on the board in room 213 is k. So it follows that the sum of the numbers denoted by expressions on the board in room 213 is k. But then $k = \pi + 6 + k$, which is absurd. So C is pathological - it appears to denote a number, but it doesn’t, on pain of contradiction.

So far, so good. You reach the conclusion that the expression C is pathological. But that is not the end of the matter; your reasoning need not stop here. If we look carefully at certain ways in which your reasoning can be extended, three distinct phenomena emerge, phenomena that call for explanation. To give them labels, these phenomena are *repetition*, *rehabilitation*, and *iteration*.

Repetition You continue:

And now if C does not denote a number, then the only expressions on the board that do denote numbers are the first two. But then the sum of the numbers denoted by expressions on the board in room 213 is $\pi+6$.

Reflecting further, you add:

In the previous sentence there is a token of the same type as C, call it C*. And C* denotes a number, namely $\pi+6$.

Your reasoning appears to be impeccable, and it shows that we can *repeat* the words of a pathological denoting phrase and successfully denote. This phenomenon calls for explanation, an explanation that should respect the validity of your reasoning and the truth of your conclusion.

Rehabilitation Having reached the conclusion that C is pathological, you continue:

And now if C does not denote a number, then the only expressions on the board that do denote numbers are the first two. But now attend again to the phrase C on the board. C makes reference to the expressions on the board that denote numbers, which we now know to be the expressions 'pi' and 'six'. And the sum of the numbers denoted by these expressions is $\pi+6$. So the phrase C -- that is, the phrase *the sum of the numbers denoted by expressions on the board in room 213* -- denotes $\pi+6$.

There's something remarkable about this discourse: you reason past the pathology of C, and find, by reasoning that is apparently natural and intuitive, that the words that compose C form a phrase that does denote. It seems that we can *rehabilitate* a pathological denoting phrase. This phenomenon also calls for explanation.

Iteration Consider the rehabilitation of C. When you rehabilitate C, you find that the words that compose C form a phrase that denotes $\pi+6$. You now continue:

Now all the phrases on the board denote numbers. So if we look again at the words that compose C, we find that they form a phrase that denotes $\pi+6+(\pi+6)$.

So now, it appears, C denotes not only $\pi+6$, but also $\pi+6+(\pi+6)$. And this reasoning, it seems, can be repeated, apparently attributing to C an open-ended series of distinct numbers as its denotata.

The reasoning that generates *repetition*, *rehabilitation* and *iteration* appears natural and intuitive. In each case, we are led to a surprising or troubling conclusion: that two tokens of the same type with the same linguistic meaning differ in semantical status (*repetition*); that C's semantical status shifts from a pathological expression that fails to refer to one that succeeds in referring (*rehabilitation*); that one and the same denoting expression has a multitude of distinct denotata (*iteration*). An adequate explanation of these phenomena must respect the naturalness and intuitiveness of the reasoning – it must not be blocked in an artificial or *ad hoc* way. The three phenomena are to be regarded as significant data which require explanation – not as nuisances that may be avoided by *ad hoc* means. If the reasoning has gone astray in some way, then the diagnosis of the error should itself be natural and intuitive; and if an apparently troubling conclusion is in fact acceptable, the explanation must make it clear why it is acceptable.

Any adequate account of these phenomena, then, must provide an analysis that preserves the plausibility of the reasoning, and so respects the data. To anticipate, I will offer a contextual explanation. With *repetition* in mind, it should perhaps come as no surprise from the outset that context-sensitivity has a role to play: we are familiar with the idea that shifts in context can confer different truth values or denotata on token expressions of the same type. *Rehabilitation*, I shall argue, is a matter of evaluating C from two distinct contexts. And the apparent anomaly

generated by *iteration* is also to be explained contextually, in terms of a type-token confusion. First, though, I need to say more about context and discourse.

2.3. Context-change and discourse analysis

We are all familiar with indexical terms, such as 'I', 'now', 'here' and so on. Consider the sentence 'I'm in Berlin now'. The content of this sentence - the proposition it expresses - depends on the context, in particular, on the speaker and the time. (It's true if I say it at the time of writing this; it will likely be false if I say it in six months' time.) So it's a familiar idea that *context acts on content*. But it has been increasingly recognized that this is not a one-way street. The reverse direction holds as well: *content acts on context*. Stalnaker writes:

"context constrains content in systematic ways. But also, the fact that a certain sentence is uttered, and a certain proposition expressed, may in turn constrain or alter the context. ... There is thus a two-way interaction between contexts of utterance and contents of utterances."²

Isard puts it this way:

"communications do not merely depend on the context for their interpretation, they change that context."³

At a given point in a conversation, the context will in part depend on what has been said before. For example, the context may change as new information is added by the participants in the conversation. Over the last twenty years or so, the kinematics of context-change has been studied by philosophers, semanticists and linguists alike.

According to Stalnaker the connection between context and available information is very tight indeed. Stalnaker writes:

"I propose to identify a context (at a particular point in a discourse) with the body of information that is presumed, at that point, to be common to the participants in the discourse."⁴

To put it another way, a context is to be represented by the shared presuppositions of the participants⁵ - or the 'common ground', to use a phrase from Grice.⁶ As new utterances are produced, and new information is made available, the context changes. For a specific example, consider the speech act of assertion: "Any assertion changes the context by becoming an additional presupposition of subsequent conversation."⁷

The shared presuppositions of conversants also figure in David Lewis's account of context-change. Lewis introduces the notion of a *conversational score*. The analogy is with a baseball score. A baseball score for Lewis is composed of a set of seven numbers that indicate, for a given stage of the game, how many runs each team has, which half of which innings we're in, and the number of strikes, balls and outs. Notice that correct play depends on the score - what is correct play after two strikes differs from what is correct play after three strikes. Similarly for conversations: the correctness of utterances - their truth, or their acceptability in some other respect - depends on the *conversational* score. Lewis continues:

"Not only aspects of acceptability of an uttered sentence may depend on score. So may other semantic properties that play a role in determining aspects of acceptability. For instance, the constituents of an uttered sentence - subsentences, names, predicates, etc - may depend on the score for their intension or extension."⁸

Following Stalnaker, Lewis identifies the set of shared presuppositions of the participants (at a given stage of a conversation) as one component of the conversational score.

"Presuppositions can be created or destroyed in the course of a conversation"⁹ - and as the set of presuppositions changes, the conversational score changes. Of course, the notion of conversational score is a vivid way of capturing the notion of context. A change in the set of presuppositions is a change of context.

Another component of the conversational score, according to Lewis, is the *standard of precision* that is in force at a given stage of the discourse. Suppose I say 'France is hexagonal'. If you have just said 'Italy is boot-shaped', and got away with it, then my utterance is true enough. The standards of precision are sufficiently relaxed. But if you have just denied that Italy is boot-shaped, and carefully pointed out the differences, then my utterance is far from true enough -- the standards of precision are too exacting. The acceptability of what I say here depends on the conversational score, on the context, which in turn depends on what has been said before. The extension of 'hexagonal' shifts with changes of context. Or, for another example, suppose I say 'The pavement is flat' under standards of flatness where the bumps in the pavement are too small to be relevant. Then what I say is true. But if the conversational score changes, and I say 'The pavement is flat' under raised standards of flatness, what I say will no longer be true. But "[t]hat does not alter the fact that it *was* true enough *in its original context*."¹⁰ Like the extension of 'hexagonal', the extension of 'flat' changes with the context.

So shared presuppositions and the standard of precision are two features of contexts that are relevant to truth. But according to Lewis, there are many more – so many, in fact, that we'll be unable to list them all. Lewis adds the following: permissibility boundaries, salience relations, the point of reference in narrative, the boundary between relevant possibilities and the ignored ones, shifts prompted by performatives, planning.¹¹ But the list is inevitably incomplete: "We have almost certainly overlooked a great many features".¹²

These contextual features change the conversational score, and Lewis argues that these changes are governed by rules – what Lewis calls *rules of accommodation*.

“... I suggest that many components of conversational score obey rules of accommodation, and that these rules figure prominently among the rules governing the kinematics of conversational score.”¹³

For example, if, in the course of a conversation, I say “All of Fred’s children are asleep”, and if my conversational partners tacitly acquiesce, then a presupposition – that Fred has children -- springs into existence, making what I say acceptable. Presupposition evolves in a rule-governed way. The rule of accommodation here says that since my utterance requires the presupposition that Fred has children, and since various other conditions hold (e.g. it is not already presupposed that Fred has children, and no one challenges what I say), the presupposition immediately comes into existence. For another example, rules of accommodation govern standards of precision: again, if you say “Italy is boot-shaped”, then my subsequent utterance of “France is hexagonal” is true, given the low standards that you have set. But those standards can be changed – say, by someone’s saying “Geometric shapes are far simpler than shapes of countries”. Now what I say is no longer true, no longer accommodated.

According to Stalnaker, contexts may be identified with the shared presuppositions of conversants; according to Lewis, the shared presuppositions are a component of the context. From their accounts of context we can extract the idea of tracking context-change by keeping a running record of shifts in the information presumed to be available to the participants. A number of semanticists and linguists have also developed this idea. For example, it is central to Heim’s file change semantics,¹⁴ Grosz and Sidner’s dynamic theory of discourse structure,¹⁵ and the familiar distinction in linguistics between *given information* and *new information*.¹⁶

2.4 Context-change and *repetition*

Let's return to the denotation discourses, starting with *repetition*. It is natural to divide the discourse into four segments:

(1) *scene-setting*, where I produce the tokens on the board, including the paradoxical token, and set you the task of identifying their denotations.

(2) *uncovering pathology*, where you argue to the conclusion that C is pathological and fails to denote;

(3) *stock-taking*, where you take stock of what does and does not denote, and in so doing, produce the repetition C* and a denotation for it; and

(4) *re-evaluation*, where you explicitly conclude that C* does denote.¹⁷

It is clear that in the transitions from one segment to the next, there is a change in the common ground or, to put it in Lewis's terms, a change in one aspect of the conversational score. Consider for example your initial response, where you say: 'But we're in room 213!' This assertion changes the context – it provides new information, and it adds to our shared presuppositions.

For another example, and a particularly significant one for my account, consider the transition from the second to the third segment of the discourse. The culmination of the reasoning of the second segment is the proposition that C is pathological and does not denote. This is information that is new, and the proposition becomes one of our shared presuppositions, part of the common ground.¹⁸ So in the transition from the second segment to the third, there is a context change - a shift in the body of information that is presumed to be available to you and me.

Let us say that the new contexts associated with the third and fourth segments are *reflective with respect to C*. In general, a context associated with a given point of a discourse is

reflective with respect to a given expression if at that point it is part of the common ground that the expression is semantically pathological (and so does not denote – or, in the cases of the Russell and the Liar, fails to have an extension or a truth value). So as we move from the second segment to the third, there is a context-change - a shift to a context that is reflective with respect to C. This context-change is an essential ingredient of a *repetition* discourse. It is the mark of any such discourse that we shift to a context which is reflective with respect to a pathological expression.¹⁹

2.5 The action of context on content

Thus far, we have seen that content acts on context - newly available information changes the context. But there is a two-way interaction between context and content: context also acts on content. We have identified the ways in which the context shifts in the denotation discourse; now we want to see how these changes in context act on content.

Remember the challenge posed by *repetition*: C and C* are tokens of the same type with the same linguistic meaning, yet one is pathological and fails to denote, while the other denotes a specific number. Our task is to explain how the changes in context produce this phenomenon. If context acts on content, we would expect there to be an expression in the discourse that is sensitive to context-change. I shall claim that 'denotes' is that expression.

Let's take a closer look at the repetition discourse. Let c_C be C's context of utterance. The occurrence of 'denotes' in C has a certain extension. If 'denotes' is not context-sensitive, this extension will remain constant throughout the repetition discourse. If 'denotes' is context-sensitive, then we may find some shift in extension as the discourse proceeds. So to determine whether or not 'denotes' is context-sensitive, we need to track the extensions of the occurrences

of ‘denotes’ through the discourse. We will let the subscripted expression ‘denotes_{cC}’ represent the occurrence of ‘denotes’ in C, and any coextensive occurrence of ‘denotes’. Some remarks about this use of the subscript are in order. First, the use of the subscript is entirely neutral as regards the question of whether ‘denotes’ is context-sensitive. It is as yet an open possibility that ‘denotes’ is a predicate constant, so that every occurrence of it may be represented by ‘denotes_{cC}’. Second, given an occurrence of ‘denotes’ that may be represented by ‘denotes_{cC}’, its context need not be c_C -- whatever its context, its representation by ‘denotes_{cC}’ tells us that it shares the same extension as ‘denotes’ in C. Third, the use of the subscript merely provides a way of registering coextensiveness. The representation of an occurrence of ‘denotes’ by ‘denotes_{cC}’ is just a way of picking out those occurrences of ‘denotes’ that have the extension that ‘denotes’ has when it occurs in C. The subscript indicates nothing specific about the extension of ‘denotes’ in C. So the subscript’s role is very modest, and contrasts sharply with the role played by subscripts that identify extensions (for example, consider a hierarchical view that stratifies the denotation predicate into a series of predicates – ‘denotes₀’, ‘denotes₁’, ..., where the subscripts indicate the specific extension of each predicate). As we will see later, specifying the extension of a particular occurrence of ‘denotes’ will be a matter of identifying its singularities.

So we represent C as

the sum of the numbers denoted_{cC} by expressions on the board in room 213.

Now in order to determine the denotation of C, one has to determine what the expressions on the board denote_{cC}, since the occurrence of ‘denotes’ in C is represented by ‘denotes_{cC}’. That is, one has to determine the denotation_{cC} of 'pi', 'six' and C. So the subscript ‘cC’ will continue to appear in the representation of your reasoning:

It's clear what the first two phrases denote_{cC}. But what about the third? Let's call your third phrase C. Suppose C denotes_{cC} the number k. Now, C denotes_{cC} k if and only if the sum of the numbers denoted_{cC} by expressions on the board in room 213 is k. So it follows that the sum of the numbers denoted_{cC} by expressions on the board in room 213 is k. But then $k = \pi + 6 + k$, which is absurd. So C is pathological - it appears to denote_{cC} a number, but it doesn't, on pain of contradiction.

Nothing so far forces a change in extension of 'denotes'; quite the reverse, in fact.

Let's pause here. As you conduct your reasoning, something is operating in the background - what we may call a *denotation schema*. A denotation schema is an exact analogue of the more familiar truth schema. An instance of the truth schema is:

'snow is white' is true if and only if snow is white.

An instance of the denotation schema is:

'3²' denotes 9 if and only if 3²=9.

Just as the truth schema provides the truth conditions for a given sentence, a denotation schema provides denotation conditions for a given referring expression - that is, the conditions under which the expression denotes an object. The general form of the denotation schema is this:

e denotes k if and only if d=k,

where 'd' and 'k' are replaced by expressions that denote objects, and 'e' is replaced by an expression that denotes the expression that replaces 'd'. Now, we've seen that to determine the denotation of C, you need to determine what the expressions on the board denote_{cC}. So the schema you use to assess the expressions on the board is this:

e denotes_{cC} k if and only if d=k.

Call this the *c_C-schema*. Now, C is one of the expressions on the board. So the schema by which you evaluate C at this stage of the discourse - call this C's *evaluating schema* - is the *c_C-schema*. Here is the instance of the schema for C:

C denotes_{cC} k if and only if the sum of the numbers denoted_{cC} by expressions on the board in room 213 is k.

Notice that the occurrences of 'denotes' on the left and right hand sides of the c_C-schema have the same extension, as the subscript makes explicit. In the course of the second segment, you assume the left hand side of the biconditional, infer the right hand side, and go on to obtain a contradiction. When you assess C by the c_C-schema, a contradiction results. C is *pathological* – that is, C cannot be assessed by its evaluating schema, on pain of contradiction. So C fails to denote_{cC} a number – if it did, it would be assessable by the c_C-schema.

Moving on to the third segment, you take stock of the deliverances of the c_C-schema:

And now, since C does not denote_{cC} a number, the only expressions on the board that do denote_{cC} numbers are the first two. But then the sum of the numbers denoted_{cC} by expressions on the board in room 213 is $\pi+6$.

It's clear that the first two occurrences of 'denotes' are to be represented by 'denotes_{cC}' – while the c_C-schema fails to deliver a denotation for C, it delivers denotations for A and B. This stock-taking leads directly to your production of C* and the identification of a denotation for it. You identify the denotation of C* as $\pi+6$ just because A and B denote_{cC} and C does not. And so the occurrence of 'denotes' in C* is also represented by 'denotes_{cC}'. In a very strict sense, then, C* does indeed repeat C – it is composed of the same words with the same meanings and the same extensions. And yet the identification of a definite denotation for C* does not lead back to contradiction. A contradiction is obtained only on the assumption that each of the expressions on the board can be assessed by the c_C-schema. But that assumption is no longer available – you've concluded C is pathological, that C cannot be assessed by the c_C-schema.

Now we have to accommodate the denotation you've identified for C*. But your evaluation of C* cannot be accommodated by the c_C-schema. C* is an exact repetition of C, and,

like C, it cannot be assessed by the c_C -schema, on pain of contradiction. C^* does not denote $_{c_C}$, *but it does denote*. The schema by which you evaluate C^* -- C^* 's *evaluating schema* -- is a schema other than the c_C -schema.

At the fourth stage, you make your evaluation of C^* explicit:

In the previous sentence, there is a token of the same type as C, call it C^* . And C^* denotes a number, namely $\pi+6$.

Given the naturalness and intuitive validity of your reasoning, we have to accommodate your conclusion; to put things in Lewis's terms, there is a rule of accommodation at work here. But, again, we cannot count your conclusion as true if your use of 'denotes' here is represented by 'denotes $_{c_C}$ '. Unlike the occurrence of 'denotes' in C^* , this latest occurrence of 'denotes' does not inherit its extension from earlier occurrences. To accommodate your evaluation of C^* , we must recognize a shift in extension. C^* is not in the extension of 'denotes' as it occurs in C, but it *is* in the extension of your use of 'denotes' at this fourth stage.

What produces this shift in the extension of 'denotes'? The change in context - specifically, the shift to a context *which is reflective with respect to C*. Consider the contexts associated with the third and fourth stages of the discourse. Both these contexts are reflective with respect to C. At the third stage, where you take stock of the deliverances of the c_C -schema, the shift to a reflective context had the effect of disengaging C from the c_C -schema. Now, at the fourth stage, the reflective character of the context brings into play a new evaluating schema. Your evaluation of C^* depends on an evaluation of the expressions on the board; in particular, it depends on the semantic information that is available about C. And in C^* 's reflective context, the information that C is pathological is now available. You evaluate C^* via a schema that yields

the denotation $\pi+6$ – a reflective schema that assesses C^* in the light of C 's pathology and its failure to denote (that is, its failure to denote_{cC}).

To be a little more precise, let E be your evaluation of C^* at the fourth stage:

(E) C^* denotes a number, namely $\pi+6$.

Let c_E be E 's context. We will represent the occurrence of 'denotes' in E by 'denotes_{cE}', where this representation applies to any occurrence of 'denotes' coextensive with the occurrence in E .

C^* 's *evaluating schema* – the schema by which you evaluate C^* at the fourth stage of the discourse – is the c_E -schema:

e denotes_{cE} k if and only if $d=k$.

(where ' d ' and ' k ' denote objects, and ' e ' denotes the expression ' d '). The instance for C^* and for $k=\pi+6$ is

C^* denotes_{cE} $\pi+6$ if and only if the sum of the numbers denoted_{cC} by expressions on the board in room 213 is $\pi+6$.

Since the context c_E is reflective with respect to C , you obtain the right hand side of this instance, and infer the left hand side. The pair $\langle C^*, \pi+6 \rangle$ is in the extension of the occurrence of 'denotes' in E , but not in the extension of the occurrence in C . The semantic expression 'denotes' is context-sensitive.

In a nutshell, we explain your different assessments of C and C^* this way: you evaluate C by the unreflective c_C -schema, and you evaluate C^* by the reflective c_E -schema. With the change in context, there is a change in the evaluating schema. There is no intrinsic difference between C and C^* - the difference lies in the schemas by which they are evaluated.²⁰

The contextual coordinate that shifts in the repetition discourse is *reflective status* – specifically, reflective status with respect to C . And there is a rule of accommodation that

governs this contextual feature, this component of the conversational score. Your conclusion that C^* denotes $\pi+6$ is acceptable, and in order to make it acceptable – “to make whatever occurs correct play”²¹ -- it is required that C^* be assessed by a schema that produces the denotation for C^* that you identify. This is a schema that assesses C^* in the light of the information that C is pathological – and this is the reflective c_E -schema, not the c_C -schema. The new information, that C is pathological, is itself *semantic* information, and it changes the standards of evaluation. And it changes the standards of evaluation because it is itself information *about those standards*. The information that C is pathological shifts the schema *because it is information about the c_C -schema* – to say that C is pathological is to say that it cannot be assessed by its evaluating schema, the c_C -schema.

Notice that C also denotes $_{c_E}$ $\pi+6$, just as C^* does – assess C by the reflective c_E -schema, and that's the result you'll get. So C fails to denote, and C does denote. But there is no contradiction here: C fails to denote $_{c_C}$, but it does denote $_{c_E}$. Compare Lewis's treatment of 'hexagonal' or 'flat'. Sometimes an utterance of 'France is hexagonal' (or 'The pavement is flat') is true, and sometimes it isn't. The extension of the predicates 'hexagonal' or 'flat' depend on the conversational score, in particular on the standards of precision that are in force. Analogously, whether or not it is true to say that C denotes will depend on the standard of assessment: do we apply the unreflective c_C -schema or the reflective c_E -schema?²²

Symmetrical remarks can be made about C^* : if we assess C^* via the c_C -schema, we find that C^* , like C , does not denote $_{c_C}$ a number. Both C and C^* have denotation $_{c_E}$ conditions; neither have denotation $_{c_C}$ conditions. C and C^* are not in the extension of 'denotes $_{c_C}$ ' (more precisely, neither C nor C^* are the first member of any ordered pair in the extension of 'denotes $_{c_C}$ '). But both C and C^* are in the extension of 'denotes $_{c_E}$ ' (more precisely, the ordered

pairs $\langle C, \pi+6 \rangle$ and $\langle C^*, \pi+6 \rangle$ are in the extension of 'denotes_{cE}').²³ The occurrence of 'denotes' in C contains neither C nor C^* in its extension; your final reflective use of 'denotes' contains both C and C^* in its extension.

Rehabilitation is analyzed along similar lines. We may represent the third segment of *rehabilitation* as follows:

And now if C does not denote_{cC} a number, then the only expressions on the board that do denote_{cC} numbers are the first two. But now attend again to the phrase C on the board. C makes reference to the expressions on the board that denote_{cC} numbers, which we now know to be the expressions 'pi' and 'six'. And the sum of the numbers denoted_{cC} by these expressions is $\pi+6$.

When you reconsider C , and determine that the sum in question is $\pi+6$, you do so in a reflective context in which C is recognized to be pathological: its evaluating schema (the c_C -schema) has failed to yield a denotation for C . As with *repetition*, at this third stage of stock-taking, the sum in question is determined just because the c_C -schema has been rejected as a means for evaluating C . And at the fourth stage of *re-evaluation*, a new evaluating schema comes into play. Your re-evaluation R of C may be represented as follows:

(R) So the phrase C – that is, the phrase *the sum of the numbers denoted_{cC} by expressions on the board in room 213* – denotes_{cR} $\pi+6$,

where c_R is R 's context of use, and 'denotes_{cR}' represents any occurrence of 'denotes' coextensive with the occurrence in R . Having concluded that C is pathological, since it cannot be evaluated by the c_C -schema, you re-evaluate C by the c_R -schema and find that C does denote_{cR}.

Here we have a single expression token, C , which receives two distinct assessment – as failing to denote (via the c_C -schema) and as denoting $\pi+6$ (via the c_R -schema). So we may call the expression C *assessment-sensitive*: its semantic value depends on the schema by which it is

evaluated (unreflective or reflective). This may bring to mind John MacFarlane on assessment sensitivity and relativism – but here we have to be careful. According to MacFarlane, there are certain expressions for which an adequate semantics requires defining extension relative not just to a context of use, but also to a *context of assessment*.²⁴ Suppose, as a child, you say “Fish sticks are tasty”. There is a fixed context of use for your utterance. But there are any number of contexts in which this utterance can be assessed. There’s the context in which you assess this utterance when you are a child (and find fish sticks tasty). There’s another context in which you assess that same utterance as an adult (when you no longer find fish sticks tasty).

Further, according to MacFarlane, assessment-sensitivity brings with it relativism about truth. Your particular dated use of the sentence “Fish sticks are tasty” may be assessed from any number of contexts – we can speak of “*the* context of use”, but not of “*the* context of assessment”. There is no one *correct* context of assessment. MacFarlane goes on to characterize relativism about truth as follows: To be a relativist about truth is to hold that languages with assessment-sensitive expressions are at least conceptually possible. Suppose we think that ‘tasty’ is such a word – its extension depends on the context of assessment. If we think this, then we are relativists about truth in English.

However, there is nothing in my contextual account of denotation that supports relativism about denotation. It is an absolute matter that C is pathological – it’s an absolute matter that it is not assessable by its evaluating schema, the c_C -schema. It’s not as if C is assessable by its evaluating schema in some contexts and not in others: it just isn’t assessable by its evaluating schema. And it’s an absolute matter that when C is reflectively assessed -- when its pathological character is taken into account -- C denotes $\pi+6$. So there *is* a *correct* kind of context from which to assess C – a context that is reflective with respect to C. The original attempt to assess

C, via the c_C -schema, was a *failed* attempt. The reflective assessment, via the c_R -schema, succeeds by taking into account that failure. The reflective assessment tells the full story about C. The case of C may be seen as a counterexample to MacFarlane's characterization of relativism: C's extension depends on the context in which it is assessed, but this does not lead to relativism.

The contextual analysis also shows how *iteration* should be understood. When you rehabilitate C, you find that C denotes $_{c_R} \pi+6$. The contextual analysis of your iterated reasoning is this:

Now all the phrases on the board denote $_{c_R}$ numbers. So if we look again at the words that compose C, we find that they form a phrase that denotes $_{c_R} \pi+6+(\pi+6)$.

The first sentence here is correct. And there is something right about the second sentence. It *will* be true to say:

(#) The sum of the numbers denoted $_{c_R}$ by expressions on the board in room 213 is $\pi+6+(\pi+6)$.

Now (#) contains a denoting phrase token *of the same type as C*, and this phrase token – call it

C** -- does denote $_{c_R} \pi+6+(\pi+6)$. If we instantiate the c_R -schema to C** we obtain:

C** denotes $_{c_R} \pi+6+(\pi+6)$ iff the sum of the numbers denoted $_{c_R}$ by expressions on the board in room 213 is $\pi+6+(\pi+6)$.

The right-hand-side is true, and so we infer the left-hand-side: C** denotes $_{c_R} \pi+6+(\pi+6)$. But

there is a crucial difference between C* and C**: while 'denotes' in C is represented by

'denotes $_{c_C}$ ', 'denotes' in C** is represented by 'denotes $_{c_R}$ '. C** is a token of the same type as

C, and so there is a sense in which the words that compose C form a phrase that denotes $_{c_R}$

$\pi+6+(\pi+6)$. However, the token C does not itself denote $_{c_C} \pi+6+(\pi+6)$ – but C** does. So we

should not conclude that C denotes *both* $\pi+6$ and $\pi+6+(\pi+6)$; C denotes (that is, denotes $_{c_R}$) only

$\pi+6$. And since C^{**} is not an expression on the board, the iteration is halted. The apparent iteration only gets off the ground by confusing C with another token of the same type.

The following summary of these denotation discourses brings out explicitly what may already be obvious enough – that the reasoning throughout is *classical*. We start with the expression (C):

(C) the sum of the numbers denoted_{cC} by expressions on the board in room 213.

We can lay out the *repetition* reasoning as follows, where A and B are respectively the first and second expressions on the board:

- (1) C denotes_{cC} a number, say k . (Assumption)
- (2) C denotes_{cC} k iff the sum of the numbers denoted_{cC} by expressions on the board in room 213 is k . (Instance of the c_C -schema)
- (3) The sum of the numbers denoted_{cC} by expressions on the board in room 213 is k . (1, 2, sentential logic)
- (4) The sum of the numbers denoted_{cC} by expressions on the board in room 213 is $\pi+6+k$. (From (1), and since A denotes_{cC} π and B denotes_{cC} 6.)
- (5) $k = \pi+6+k$. (3,4, logic of identity)
- (6) C does not denote_{cC} a number. (By *reductio*, given absurdity at line (5))
- (7) The sum of the numbers denoted_{cC} by expressions on the board in room 213 is $\pi+6$. (From (6), and since A denotes_{cC} π and B denotes_{cC} 6)

(7) contains C^* , a repetition of C . Accommodating the truth of (7) forces a new standard of evaluation, the denotes_{cE}-schema. Instantiating that schema to C^* and $\pi+6$

- (8) C^* denotes_{cE} $\pi+6$ iff the sum of the numbers denoted_{cC} by expressions on the board in room 213 is $\pi+6$.

It follows that

- (9) C^* denotes_{cE} $\pi+6$. (From 7, 8 and sentential logic).

This completes the *repetition* reasoning, and it's classical.

The *rehabilitation* reasoning takes this instance of the c_R -schema:

C denotes $_{c_R}$ $\pi+6$ iff the sum of the numbers denoted $_{c_C}$ by expressions on the board in room 213 is $\pi+6$,

and uses sentential logic to infer the left-hand side from the right, which has been established at line 7 above. The *iteration* reasoning applies the c_R -schema to the expression C^{**} , and uses sentential logic to infer that C^{**} denotes $_{c_R}$ $\pi+6+(\pi+6)$. Again, the reasoning is classical.

2.6 Reflective status as a contextual coordinate

Whether we focus on *repetition* or *rehabilitation*, the upshot is the same: *the predicate 'denotes' is a context-sensitive term that may shift its extension with a change in context.* With the indexical 'I', the extension depends on who is speaking in the given context of utterance. According to Lewis's treatment of 'hexagonal' and 'flat', the extension depends on the standards of precision that are in force in the given context. And with the predicate 'denotes', the extension depends on the schema of assessment that is in force in the given context. This in turn depends on the common ground, the information that is presumed to be available – in particular, information concerning the pathologicity of denoting expressions. When C is first produced, the information that it is pathological is not part of the common ground. Once the information that C is pathological is incorporated into the common ground, we have a new standard: the subsequent evaluating schema is *reflective with respect to C*. In the case of C, then, the extension of 'denotes' depends on whether or not the evaluating schema is reflective with respect to C. We have identified a contextual feature – the *reflective status* of a context – to which the term 'denotes' is sensitive.

If we do not attend to our ability to reason past pathology, *reflective status* will not be an obvious contextual coordinate (unlike the familiar coordinates of speaker, time and place, for example). So the claim that ‘denotes’ is a context-sensitive term may come as a surprise. But I have argued in this chapter that once we pay careful attention to denotation discourses where we do reason past pathology, it is natural and intuitive to conclude that ‘denotes’ is indeed sensitive to the reflective status of a context. Cresswell once wrote:

“It seems to me impossible to lay down in advance what sort of thing is going to count [as a relevant feature of context] ... The moral here seems to be that there is no way of specifying a finite list of contextual coordinates.”²⁵

As we saw earlier, Lewis agrees: any list of contextual coordinates will inevitably be incomplete. Along with Cresswell, Lewis, Stalnaker and others, we should be open to contextual coordinates beyond the familiar ones. If we recognize that content acts on context, that new information or new presuppositions can change the context, then we can identify contextual coordinates that we might otherwise miss. Reflective status is such a coordinate. When you conclude that C is pathological, a new presupposition is created, and the context changes. And the context-change is a change in reflective status. The key difference between context c_C and context c_E , for example, is the difference in reflective status: context c_C is not reflective with respect to C, but c_E is.

Some expressions, such as the indexicals ‘I’, ‘here’, ‘now’, wear their context-sensitivity on their sleeve. These expressions immediately trigger a search for the appropriate speaker, place or time. It is less immediately obvious that expressions such as ‘small’, ‘hexagonal’ and ‘flat’ are context-sensitive. But once we understand how ‘small’ works – say, in the sentence ‘Sherman is small’ – we understand that it is relevant that, given the context, Sherman is an elephant and small compared to most elephants. So, as Recanati puts it, “*there is an expression*

in the sentence, namely the adjective ‘small’ itself, *that triggers the search for a relevant comparison class*, just as an indexical triggers the search for an appropriate contextual value.”²⁶

And once we understand how, say, the expressions ‘hexagonal’ and ‘flat’ work, these expressions will trigger a search for the standards of precision supplied by the context. Similarly with ‘denotes’. Once we understand how ‘denotes’ behaves in *repetition* and *rehabilitation* discourses, the expression will trigger a search for the standards of assessment supplied by a given context. And that is a matter of the context’s reflective status, a matter of what counts as pathological in the given context. Given a use of ‘denotes’ in some context *c*, we cannot determine whether a pathological denoting phrase *d* is in its scope unless we know whether or not the context *c* is reflective with respect to *d*.

It is not initially obvious that ‘denotes’ is context-sensitive. But that’s not because *reflective status* is an obscure feature of a context. Quite apart from claims about the context-sensitivity of ‘denotes’, it’s straightforward to say, for any context, whether or not that context is explicitly reflective with respect to a given pathological phrase. That is just a matter of whether or not it is part of the common ground that the phrase is pathological.²⁷ What makes the context-sensitivity unobvious is that discourses that exhibit the context-sensitivity of ‘denotes’ – *repetition* and *rehabilitation* -- are not everyday discourses. Most speakers of English do not engage with the paradoxes of denotation. But the context-sensitivity of ‘denotes’ is no less real for that. The reasoning carried out in these discourses is intuitive: once the ordinary speaker engages with paradoxical expressions like *C*, the reasoning they employ is natural reasoning, based on their ordinary grasp of ‘denotes’. And that reasoning displays the context-sensitivity of ‘denotes’.

2.7 Four tests for context-sensitivity

Consider again the reasoning that leads to (#):

(#) The sum of the numbers denoted_{cR} by expressions on the board in room 213 is $\pi+6+(\pi+6)$.

You reason that C does not denote because it is pathological; you go on to rehabilitate C, finding that it denotes $\pi+6$; you conclude that the sum of the numbers denoted by expressions on the board is $\pi+6+(\pi+6)$. If, as I have suggested, this reasoning is intuitive and sound, then it shows, in a specially compact way, that the term ‘denotes’ passes four tests that have been proposed for genuine context-sensitivity.

The first test is Cappelen and Lepore’s *intercontextual disquotations test* (ICD test).²⁸

Suppose I say, while hungry:

An utterance of ‘I am hungry’ can be false, even though I am hungry.

According to Cappelen and Lepore, this is fine – I can recognize that there are other tokens of “I am hungry” which are false, while it is indeed true that (right now) I am hungry. So ‘I’ passes this test for context-sensitivity – and so will any genuinely context-sensitive term.

Consider a parallel utterance involving ‘knows’. Suppose I say on some particular occasion:

An utterance of ‘Lewis knows penguins eat fish’ can be false, even though Lewis knows penguins eat fish.

According to Cappelen and Lepore, this is not fine, and ‘knows’ fails the test.

Now consider the case of ‘denotes’ – in particular the reasoning leading to (#). At the point where you conclude (#), you can say:

(ICD) An utterance of ‘the sum of the numbers denoted by expressions on the board is $\pi+6+(\pi+6)$ ’ can be false, even though the sum of the numbers denoted by expressions on the board is $\pi+6+(\pi+6)$.

And you can say this because earlier in the discourse you yourself asserted: “The sum of the numbers denoted by expressions on the board is $\pi+6$ ”.

The contextual analysis has a ready account of why it is that you can say ICD. Your *use* of ‘denotes’ in IQT is represented by ‘denotes_{cR}’, and the sum of the numbers denoted_{cR} by expressions on the board is $\pi+6+(\pi+6)$. But the occurrence of ‘denotes’ within quotation marks is not tied to the context of your overall utterance, any more than is the quoted occurrence of ‘I’ in Cappelen and Lepore’s example. Just as I can recognize that other tokens of ‘I am hungry’ can be false, even in a context when I’m hungry, you can recognize, in your reflective context, that other tokens of the type of C do not denote $\pi+6+(\pi+6)$. Indeed, it was by recognizing this that you arrived at (#): it was by recognizing that C itself denotes $\pi+6$, once it is rehabilitated.

The ICD Test is closely related to a second test for context-sensitivity, which Cappelen and Lepore call *Real Context Shifting Arguments* (RCSAs).²⁹ Suppose someone wanted to persuade you that ‘knows’ is context-sensitive, and you were not convinced by their appeal to the ICD test. Then they might try to appeal to your intuitions by telling the following story, which Cappelen and Lepore call *Known Rupert*:

Right now, I’m doing philosophy and thinking about Rupert. Rupert, however, is not now doing philosophy. Instead, he’s home making tea. Rupert doesn’t know he is 30 years old. For Rupert to know he is 30 years old, he has to rule out the possibility that he is a brain in a vat. Rupert, however, is unaware of (or not thinking about) this possibility. And so he’s ignoring a possibility that must be ruled out in order for anyone to know anything at all. Still, when Rupert utters in the comfort of his home, ‘I know I am 30 years old’ what he says is true, because he’s ignoring this possibility, even though this possibility has got to be considered in order for Rupert to know anything at all.

According to Cappelen and Lepore, *Known Rupert* is “blatantly false”, and provides no support for the context-sensitivity of “know”. They contrast this purported RCSA with a genuine one:

Right now, Stephen is not wearing a hat. Yesterday he was wearing a hat. And when he then uttered ‘I’m wearing a hat now’ what he said then was true, even though he’s clearly not wearing a hat now.

Cappelen and Lepore take this RCSA to provide clear evidence that ‘now’ is context-sensitive.

We can construct an RCSA for ‘denotes’. Consider the following discourse, where the first sentence is your utterance of (#):

The sum of the numbers denoted by expressions on the board in room 213 is $\pi+6+(\pi+6)$. So the sum of the numbers denoted by expressions on the board is not $\pi+6$. But there are true utterances of ‘the sum of the numbers denoted by expressions on the board is $\pi+6$ ’. Indeed, I produced such an utterance earlier in this discourse!

This is an RCSA of a specially compact kind, since the speaker can refer back to their own earlier utterance to make the point. So ‘denotes’ passes this test.

According to a third test proposed by Cappelen and Lepore, an expression is context-sensitive only if “it typically blocks intercontextual disquotational indirect reports.”³⁰ For example:

“Consider an utterance by Rupert on Tuesday of ‘John will go to Paris tomorrow’. If someone tries to report on Wednesday what Rupert said with his utterance on Tuesday with an utterance of ‘Rupert said that John will go to Paris tomorrow’, his report is false ...”³¹

This test provides strong evidence that ‘tomorrow’ is context-sensitive. Contrast the expression ‘ready’, which according to Cappelen and Lepore is not context-sensitive. Suppose Nina says ‘John is ready’ in two separate contexts, one in which John is preparing for an exam, and one in which he is getting dressed for heavy rain. In either case, you can truly say ‘Nina said that John is ready’, whatever your own context of utterance happens to be (perhaps you are sitting in a café in New York City). You can even truly say: ‘In both contexts, Nina said that John is ready’. Your indirect report is not blocked – ‘ready’ fails the test.³²

Consider now the following discourse, where the first sentence is your utterance of (#), arrived at via the rehabilitation of C:

The sum of the numbers denoted by expressions on the board in room 213 is $\pi+6+(\pi+6)$. Earlier, I said that the sum of the numbers denoted by expressions on the board in room 213 is $\pi+6$.

In this reporting context, your uses of ‘denotes’ are tied to the reflective context of (#) – just as the reporting context for Rupert’s utterance is tied to its being Wednesday. Now your indirect report suggests that in the course of your reasoning you have contradicted yourself – and that’s false, given our background assumption that the reasoning to (#) is intuitive and sound. So the indirect report is blocked. According to our contextual analysis, the falsity of the indirect report is readily explained: you did not earlier say that the sum of the numbers denoted_{c_R} by expressions on the board in room 213 is $\pi+6$; rather, you said that the sum of the numbers denoted_{c_C} by expressions on the board in room 213 is $\pi+6$.

We’ve just observed that in the course of the reasoning to (#), we produce these two sentences: “The sum of the numbers denoted by expressions on the board in room 213 is $\pi+6$ ”, and “The sum of the numbers denoted by expressions on the board in room 213 is $\pi+6+(\pi+6)$ ”. But, again assuming the naturalness and soundness of the reasoning to (#), these utterances do not really disagree each other: both are true. This relates to a fourth test for context sensitivity, Cappelen and Hawthorne’s *disagreement test*.³³ Suppose Joe asserts “I am hungry”, and Kate asserts “I am not hungry” – then a third party cannot correctly say that Joe and Kate disagree. In general, if t is a context-sensitive term, there will be cases in which Joe can assert ϕ , where ϕ contains t , Kate asserts not- ϕ , but Leah cannot correctly say that they disagree. It might be held that ‘knows’ fails this test: it might be held that if Joe asserts that Lewis knows that penguins eat

fish and Kate asserts that Lewis does not know that penguins eat fish, then it will be correct to say that they disagree.

Now consider ‘denotes’, and focus again on the reasoning leading to (#). Given that the reasoning is sound, ‘denotes’ passes the disagreement test. Indeed, you can be Joe, Kate and Leah rolled into one. In the course of the reasoning, you assert “C does not denote” (because pathological), and then you go on to assert “C does denote” (this is rehabilitation). And you recognize that there is no disagreement here -- it is because C does not denote, while A and B do, that you find that C does denote $\pi+6$. You could not rehabilitate C without first concluding that C does not denote. Again, the contextual analysis says why there is no disagreement: C does not denote_{cC}, but it does denote_{cR}.

2.7 A simple Russell

An examination of our simple paradoxes of *extension* and *truth* from Chapter 1 reveals the same phenomena of repetition, rehabilitation and iteration. And the contextual analysis runs parallel: the predicates ‘extension’ and ‘true’ are context-sensitive, they pass the four tests for context-sensitivity, and the reasoning throughout is classical.

Consider first the case of extension, and the associated repetition discourse. Suppose that, unaware of my whereabouts, I write on the board in room 213 the following two predicates:

(M) moon of the Earth

(P) unit extension of a predicate written on the board in room 213.

This is the first stage (*scene-setting*). As with the simple paradox of denotation, you can reason to the conclusion that P is pathological (*uncovering pathology*). Then you review the semantic status of the expressions on the board (*stock-taking*), and proceed to produce a repetition of P, a

token P^* of the same type as P , and you determine that P^* has a well-determined extension (*re-evaluation*).

The contextual analysis of *repetition* runs as follows. The expression ‘the extension of’ denotes an operator which carries a predicate to its extension. Let c_P be P ’s context of utterance, and let ‘ extension_{c_P} ’ represent any occurrence of ‘extension’ that is coextensive with the occurrence of ‘extension’ in P . So ‘ extension_{c_P} ’ represents the occurrence of ‘extension’ in P , and any coextensive occurrence.³⁴ So the pathological predicate P , produced at the first stage of the repetition discourse, is represented by:

unit extension_{c_P} of a predicate written on the board in room 213.

At the second stage, where you uncover pathology, you attempt to determine an extension for P . In general, membership conditions for extensions are given by the schema

x is in the extension of φ iff x is Φ ,

where x ranges over objects, ‘ Φ ’ is replaced by a predicate, and φ is replaced by a name of that predicate. For short, we will express this schema as:

x is in $\text{ext}(\varphi)$ iff x is Φ

Given that the occurrence of ‘extension’ in P is represented by ‘ extension_{c_P} ’, the extension of P will depend on the extensions_{c_P} of the predicates on the board, so those expressions are evaluated by the c_P -schema:

x is in $\text{ext}_{c_P}(\varphi)$ iff x is Φ .

In particular, since P is one of the expressions on the board, P is evaluated by the c_P -schema.

Here’s the instance of the schema, putting P for φ , and $\text{ext}_{c_P}(P)$ for x :

$\text{ext}_{c_P}(P)$ is in $\text{ext}_{c_P}(P)$ iff $\text{ext}_{c_P}(P)$ is a unit extension_{c_P} of a predicate on the board in room 213.

You suppose first the left hand side. Then $\text{ext}_{cP}(P)$ has two members, so the right hand side does not hold. And so the left hand side doesn't hold – contradiction. Now you suppose that the left hand side does not hold -- that $\text{ext}_{cP}(P)$ is not in $\text{ext}_{cP}(P)$. Then $\text{ext}_{cP}(P)$ has one member ($\text{ext}_{cP}(M)$), so the right hand side holds. And so the left hand side holds -- contradiction again. So an extension for P cannot be determined via the cP -schema: the extension_{cP} operator produces no output for input P. You conclude:

P does not have a well-determined extension_{cP} .

This is the conclusion of classical *reductio* reasoning that generates a contradiction from your attempt to evaluate P via the cP -schema.

At the third stage, you take stock, reflecting on P's pathologicity. The contextual analysis of stock-taking looks like this (for your intuitive reasoning, remove the subscripts):

Since P does not have an extension_{cP} , it does not have a unit extension_{cP} . In contrast, M does have a unit extension_{cP} . So the extension_{cP} of M is the only unit extension_{cP} of a predicate written on the board in room 213.

In the first sentence, you draw the consequences of abandoning the cP -schema as an evaluating schema for P. In the last sentence you produce P^* , an exact repetition of P, and at the same time you identify a definite extension for P^* ($\text{ext}_{cP}(M)$ is its only member). This does not lead back to paradox, even though P^* is a repetition of P. The derivation of a contradiction requires the assumption that each of the expressions on the board can be assessed by the cP -schema -- and you've already established that the assumption does not hold for P.

At the fourth stage, you make explicit your evaluation E of P^* :

(E) In the previous sentence, there is a token of the same type as P, and it has a well-determined extension whose sole member is the extension of M.

Now we need to accommodate your conclusion. Since P^* is a repetition of P , P^* cannot be assessed by the c_P -schema. In parallel to the case of denotation and C^* , P^* does not have an extension_{c_P} , *but it does have an extension*. P^* is in the scope of your use of ‘extension’ at the fourth stage. Let c_E be the context of your explicit evaluation of P^* , and let ‘denotes $_{c_E}$ ’ represent the occurrence of ‘extension’ in E , and any coextensive occurrence. P^* ’s *evaluating schema* at the fourth stage is the c_E -schema, and the instance for P^* is

x is in $\text{ext}_{c_E}(P^*)$ iff x is a unit extension_{c_P} of a predicate written on the board in room 213.

Since the context c_E is reflective with respect to P , the information is available that P is pathological and does not have an extension – that is, does not have an extension_{c_P} . So the right hand side is true for $x = \text{ext}_{c_P}(M)$, and false otherwise. And so $\text{ext}_{c_P}(M)$ is the sole member of $\text{ext}_{c_E}(P^*)$. We have accommodated your evaluation of P^* . In the terms of the contextual analysis, you draw this conclusion: P^* has a well-determined extension_{c_E} , whose sole member is $\text{ext}_{c_P}(M)$.

So the difference between P and P^* is this: P is evaluated in a context that is not reflective with respect to P , and P^* is evaluated in a context that *is* reflective with respect to P . And the results are different – the extension operator fails to produce a value for P in the context c_P , but produces a determinate value for P^* in the context c_E . As in the case of denotation, the new information that P is pathological is itself semantic information, and it changes the standards of evaluation because it is information about those standards. The information that P is pathological shifts the schema because it is information about the c_P -schema – it just is the information that P cannot be assessed by its evaluating schema, the c_P -schema. This information

allows you to determine a definite extension for P^* via a new reflective standard – the c_E -schema.

While P^* has a well-determined extension $_{c_E}$, it does not have an extension $_{c_P}$ – evaluate P^* by the c_P -schema, and we get a contradiction, just as we did with P . And while P fails to have an extension $_{c_P}$, it does have an extension $_{c_E}$, just as P^* does. P^* is an exact repetition of P , and neither have an extension $_{c_P}$, and both have an extension $_{c_E}$. So $\text{ext}_{c_P}(P)$ is undefined (as is $\text{ext}_{c_P}(P^*)$), but $\text{ext}_{c_E}(P)$ is the extension containing the Moon as its sole member (as is $\text{ext}_{c_E}(P^*)$). So the extension operator is context-sensitive: the extension it determines for P (or for P^*) depends on the context in which it is operating.

Consider now the *rehabilitation* discourse. The first two stages are the same as those of *repetition*. Here is stage three, *stock-taking*, with the contextual subscripts already marked (for the intuitive reasoning, ignore the subscripts):

Since P does not have an extension $_{c_P}$, M is the only predicate on the board that has a unit extension $_{c_P}$. But now attend again to the predicate P on the board. P makes reference to the predicates on the board that have unit extensions $_{c_P}$, and we now know there is just one, namely M . And the unit extension $_{c_P}$ of M is the extension $_{c_P}$ with sole member the Moon.

At the fourth and final stage, you *re-evaluate* P . Let R be your re-evaluation, c_R its context, and let ‘extension $_{c_R}$ ’ represent the occurrence of ‘extension’ in R , and any coextensive occurrence.

Here is your re-evaluation:

(R) So the predicate P – made up of the words *unit extension $_{c_P}$ of a predicate written on the board in room 213* – has an extension $_{c_R}$ (namely, the extension with sole member the unit extension $_{c_P}$ whose sole member is the Moon).

At the second stage, P is assessed by the c_P -schema, and found to be pathological, lacking an extension $_{c_P}$. We then take stock, and determine that there is just one unit extension $_{c_P}$ of a predicate on the board, given that P is pathological. In the light of this stock-taking, we go on to

re-evaluate P via the reflective c_R -schema, and find that it does have a determinate extension $_{cR}$. In the case of repetition, we have distinct schemas applied to distinct tokens; in the case of rehabilitation, we have distinct schemas applied to one and the same token. As in the case of denotation, rehabilitation shows that the extension operator is assessment-sensitive – but this does not lead to relativism.

Turning to *iteration*, the contextual analysis runs as follows (ignore the subscripts for the intuitive reasoning):

Once P is rehabilitated, we find that P has an extension $_{cR}$, as does M – each is a unit extension $_{cR}$ of a predicate written on the board in room 213. Here is another token of the same type as P (and P^*), but its extension has two members: the unit extension $_{cR}$ containing the Moon, and the unit extension $_{cR}$ containing just the extension whose sole member is the Moon.

Let P^{**} be this newly produced token of the same type as P . The difference between $\text{ext}_{cR}(P)$ and $\text{ext}_{cR}(P^{**})$ is readily explained, since the occurrences of ‘extension’ in P and in P^{**} are differently represented, the former by ‘extension $_{cP}$ ’ and the latter by ‘extension $_{cR}$ ’. As we run through *rehabilitation* and then *iteration*, we move from P having no extension $_{cP}$ to P having a single-membered extension $_{cR}$ to P^{**} having a 2-membered extension $_{cR}$.

Any further iteration is halted, since P^{**} is not a predicate written on the board. We can move soundly between the two sides of this biconditional:

$\text{ext}_{cR}(P^{**})$ has two members if and only if $\text{ext}_{cP}(P)$ has one member,

and there is no vicious circle or regress here.

2.8 A simple Liar

Suppose now that I inadvertently produce a liar sentence L on the board in room 213:

(L) The sentence written on the board in room 213 is not true.

Since you know where the sentence is written, you can reason in the familiar way that L is a liar sentence, and semantically defective. But if L is defective, then whatever its status, it is not a truth. So you infer:

(L*) The sentence written on the board in room 213 is not true.

This is a *repetition* of (L). At the final stage of the repetition discourse, you explicitly declare L* to be true. Now, since L* is true, and it says the same thing as (L), it follows that (L) is true too: (L) is *rehabilitated*. And with rehabilitation comes *iteration*: if (L) is true, then what it says is the case, so it isn't true; but then if it isn't true, then since that is what it says, it is true, and so on, indefinitely.

Let c_L be the context of use of L, and let 'true $_{c_L}$ ' represent a use of 'true' coextensive with the use of 'true' in L (again, as with 'denotes' and 'extension', this is not to assume that 'true' is context-sensitive). Then L is represented as

(L) The sentence written on the board in room 213 is not true $_{c_L}$.

In order to determine L's semantic status, it has to be determined whether the sentence it refers to is true $_{c_L}$ or not. So the schema by which you evaluate the sentence on the board is the c_L -schema:

s is true $_{c_L}$ if and only if S,

where 's' is a name of the sentence that replaces 'S'. That is, L's *evaluating schema* is the c_L -schema. But now you obtain a contradiction from this instance of the c_L -schema:

L is true $_{c_L}$ iff the sentence written on the board in room 213 is not true $_{c_L}$,

since L is the sentence written on the board. You uncover pathology: L cannot be assessed by its evaluating schema. Your reasoning is classical, a *reductio* of the assumption that L can be assessed by the c_L -schema.

You now take stock of L's semantic status: given that L is pathological, you go on to declare that it is not true. This is your repetition of L, represented as follows:

(L*) L is not true_{c_L} .

This is indeed a correct evaluation of L, because L cannot be true_{c_L} . For if L were true_{c_L} , it would follow that it is assessable by the c_L -schema, and, with the c_L -schema on board, contradiction would follow. In contrast, a contradiction does not follow from L*, from L's being not true_{c_L} . To obtain a contradiction, you would need the further assumption that the sentence on the board is assessable by its evaluating schema (the c_L -schema) – but, as you have just concluded, this assumption is false. So, as in the cases of denotation and extension, the repetition of the pathological expression does not lead back to contradiction.³⁵

At the final stage of the repetition discourse, you attend to the repetition L* and explicitly evaluate it as true:

(Σ) L* is true.

Given the soundness of your reasoning, we need to accommodate your evaluation of L* -- a rule of accommodation is at work. L* is a repetition of L, and, just like L, it cannot be assessed by the c_L -schema. So L* is not true_{c_L} , *but it is true* – L* is in the extension of your use of 'true' in Σ . Let c_Σ be Σ 's context, and let ' true_{c_Σ} ' represent the occurrence of 'true' in Σ and any coextensive occurrence. L*'s *evaluating schema* is the c_Σ -schema, and the instance for L* is:

L* is true_{c_Σ} iff L is not true_{c_L} .

Since the context c_Σ is reflective with respect to L, the information is available that L is pathological and not true – that is, not true_{c_L} . The right hand side is just L^* , which you have produced at the stock-taking stage of the repetition reasoning. Then you infer the left hand side from the right hand side -- and we have accommodated your evaluation Σ .

As with C and C^* , and P and P^* , there is no intrinsic difference between L and L^* ; rather, the difference lies in the schemas by which they're assessed in the course of the reasoning. The contextual shift in evaluating schemas is produced by the new information that L is pathological. In parallel with the cases of denotation and extension, this information changes the standards of evaluation because it is information about those standards: to say that L is pathological is to say that it cannot be evaluated by its evaluating schema, the c_L -schema.

The first three stages of *rehabilitation* are the same as those of *repetition*. At the third stage, when you take stock, you conclude that L is not true_{c_L} (because pathological). At the fourth stage, you re-evaluate L, and your re-evaluation may be represented as:

(R) L is true_{c_R} ,

where c_R is the context of R, and ' true_{c_R} ' represents the occurrence of 'true' in R and any coextensive occurrence. Here, L is evaluated by the *reflective* c_R -schema:

L is true_{c_R} if and only if L is not true_{c_L} .

Here, as with the c_Σ -schema, the right hand side is L^* , which you have already obtained, in the light of L's pathologicity – and so you infer the left hand side, which is just R. L is not in the extension of ' true_{c_L} ', but is in the extension of the occurrence of 'true' in R. In this way, we accommodate your evaluation R. When you first attempt to evaluate L, you apply the unreflective c_L -schema to L, and the application breaks down. But the subsequent application of the reflective c_R -schema establishes a truth value for L (just as the reflective c_Σ -schema does for

L*). As with ‘denotes’ and ‘extension’, ‘true’ is assessment-sensitive, but this does not entail relativism.

Prior to analysis, it may seem that *rehabilitation* generates an unacceptable kind of *iteration*: if L is true, then what it says is the case, so it’s not true; but that’s what it says, so it is true – and so on, indefinitely. But this back and forth is readily explained by the contextual analysis. We are moving soundly from one side to the other of this instance of the c_R -schema:

L is true $_{c_R}$ iff L is not true $_{c_L}$,

and any appearance of contradiction is removed.

In this chapter, I’ve argued that the phenomenon of *repetition*, *rehabilitation* and *iteration* are best explained by a contextual analysis. Our semantic expressions are context-sensitive. This is the first main claim of the singularity theory. The second main claim is that semantic expressions apply everywhere except for certain singular points or singularities where their application breaks down. Singularities are the subject of the next two chapters.

Endnotes to Chapter 2

1. Discussions of the Strengthened Liar can be found in Parsons 1974a, Burge 1979, Barwise and Etchemendy 1987, Gaifman 1988 and 1992, Simmons 1993, Glanzberg 2001, Gauker 2006, Field 2008, Chapter 14.
2. Stalnaker 1975, in Stalnaker 1999, p.66.
3. Isard 1975, quoted in Brown and Yule 1983.
4. Stalnaker 1988, in Stalnaker 1999, p.98. This is a repeated theme in Stalnaker's writings; for example, on p.6 of his introduction to Stalnaker 1999, he writes:
"... a context should be represented by a body of information that is presumed to be available to the participants in the speech situation."
5. Stalnaker is sometimes is a little more cautious about the relation between context and shared presuppositions - for example: "The shared presuppositions of the participants in a linguistic situation are perhaps the most important constituent of a context." (Stalnaker 1970, in Stalnaker 1999, p.40)
6. From Grice's *William James Lectures*, in Grice 1989.
7. Appendix to Stalnaker 1975, in Stalnaker 1999, p.77. (Stalnaker notes that a more careful formulation would include the qualification that the assertion is not rejected or contradicted.) In a similar vein, Stalnaker writes:
"... the essential effect of an assertion is to change the presuppositions of the participants in the conversation by adding the content of what is asserted to what is presupposed."
(Stalnaker 1978, in Stalnaker 1999, p.86.)
8. Lewis 1979, in Lewis 1983, p.238.
9. Lewis 1979, in Lewis 1983, p.233.
10. Lewis 1979, in Lewis 1983, p.246.
11. See Lewis 1979.
12. Lewis 1980, p.87.
13. Lewis 1979, p.347.
14. Irene Heim's file change semantics identifies the common ground of a context with what she calls the 'file' of that context (Heim 1988, p.286). A file contains all the information that has been conveyed up to that point - and the file is continually updated as the discourse moves on.

Heim's account is more fine-grained than Stalnaker's, since it is sensitive to the subsentential structure of sentences (see Heim 1988, p.288). There are certain parallels between Heim's theory of file changes and Reinhart's analysis of sentence topics, which is also more fine-grained than Stalnaker's (Reinhart 1981).

15. According to Grosz and Sidner, a discourse is a sequence of utterances, and such a sequence is naturally aggregated into discourse segments – they call such an aggregation the *linguistic structure* of a discourse. Each utterance within a segment plays a particular role with respect to that segment, and in turn each segment serves a function with respect to the discourse as a whole (see Grosz and Sidner 1986, p.177).

What Grosz and Sidner call an *intentional structure* is a structure of purposes. A discourse typically has an overall purpose, and associated with each discourse segment is a purpose which specifies how this segment contributes to the overall purpose. Grosz and Sidner identify two relations between discourse segment purposes (DSPs): *dominance* and *satisfaction precedence*. DSP1 *dominates* DSP2 if satisfying DSP2 is intended to provide part of the satisfaction of DSP1. And DSP1 *satisfaction-precedes* DSP2 if DSP1 must be satisfied before DSP2. The intentional structure associated with a given discourse is given by the relations of dominance and satisfaction-precedence.

16. The distinction has been characterized in a variety of ways by linguists and psycholinguists. For example, for Halliday (1967), *new information* is information not recoverable from the preceding discourse; for Clark and Haviland (1977), it is information the speaker believes the listener does not know; for Chafe (1976), it is information the speaker assumes he is introducing into the addressee's consciousness, where a known item can be 'new' if it is not currently in the addressee's consciousness (see also Brown and Yule, 1983). Standard characterizations of *given information* are in line with Stalnaker's representation of context as common ground or shared presuppositions: for example, for Prince (1981), given information is shared knowledge, and for Clark and Haviland (1977), given information is information the speaker believes the listener already knows and accepts as true (see also Clark and Clark, 1977).

17. Following Grosz and Sidner's account, we can associate distinct purposes with each discourse segment. Given the case of C as described, the first segment is associated with my intention that you intend to evaluate the denoting phrases; with the second, your intention that I believe that C is pathological; with the third, your intention that I believe, given the pathologicity of C, that the sum in question is $\pi+6$; and with the fourth, your intention that I believe that C* denotes $\pi+6$.¹⁷ It is straightforward to check that DSP1 (the purpose associated with the first discourse segment) satisfaction-precedes DSP2, DSP2 satisfaction-precedes DSP3, and DSP3 satisfaction-precedes DSP4; also DSP3 dominates DSP2 and DSP4 dominates DSP3.¹⁷ Thus we may describe what Grosz and Sidner call the *intentional state* of our denotation discourse.

Muskens, van Benthem and Visser stress that the Grosz and Sidner model of discourse suggests a similarity between the structure of discourse and the structure of proofs in a natural deduction system. In certain cases, they suggest, the purpose of a segment may be compared with the conclusion it is intended to establish, and the notion of satisfaction-precedence may reflect the way in which the conclusion of one segment may need the conclusion of another.

(See Muskens, van Benthem and Visser 1997, p.609.) The denotation discourse provides such a case. DSP2, DSP3 and DSP4 may be compared with the conclusions you establish in the second, third and fourth segments; and the way in which the conclusion of the third segment depends on the conclusion of the second is reflected in the fact that DSP2 satisfaction-precedes DSP3; and similarly, the way in which the conclusion of the fourth segment depends on the conclusion of the third is reflected in the fact that DSP3 satisfaction-precedes DSP4.

18. According to Heim's account, I will register this shift by updating the file card that stores information about C: I will now add the entries 'is pathological' and 'does not denote a number'. We can also put things in the terms of Reinhart 1981 (see note 14 above): at a given point in the discourse, there will be certain information available about C, and under the NP sentence-topic 'C' will fall propositions representing that information. The transition to the reflective context is marked by the addition of a new proposition to this subset of propositions: the proposition that C is pathological and does not denote a number.

According to Grosz and Sidner, there is a *focusing structure* associated with each discourse segment, and this structure "is the central repository for the contextual information needed to process utterances at each point in the discourse. It distinguishes those objects, properties, and relations that are most salient at that point and, moreover, has links to relevant parts of both the linguistic and intentional structures" (Grosz and Sidner 1986, p.182). The focusing structure associated with the third segment will distinguish C's pathologicity and its failure to denote.

19. Other denotation discourses may have different intentional structures, to use Grosz and Sidner's term. For example, imagine a case where I deliberately produce a pathological denoting phrase for my audience, and go on to rehabilitate it, assessing it in the light of its pathology. Here my initial intention is that my audience recognize the pathology of the phrase, and my subsequent intention is that my audience believe that it has a denotation when subsequently assessed in the light of its pathology. Clearly, this intentional structure is different from those of the denotation discourses we have been analyzing. But there is a common core: all these strengthened discourses will be composed of distinct stages, associated with different purposes and intentions, and in each case the final discourse segment purpose will involve the reflective evaluation of a pathological phrase.

20. Clearly the schemas must be restricted in some way. Given an unrestricted c_C -schema:

s denotes $_{sC}$ n iff $p=n$

and an unrestricted c_E -schema:

s denotes $_{sE}$ n iff $p=n$,

we will obtain this unacceptable collapse: ' p ' denotes $_{sC}$ n iff ' p ' denotes $_{sE}$ n . We will see in subsequent chapters that these restrictions are minimal, limited to the singularities of ' denotes_{sC} ' and ' denotes_{sE} '.

21. Lewis 1979, p.347.

22. Priest has suggested that a contextual approach to the Berry paradox won't avoid the paradox, because one can explicitly fix the context as one presents the paradox: "There is only a

finite number of names with less than 100 words. A fortiori, the number of numbers that I can refer to in this context, c , is finite. Consider the least number that I cannot refer to (in this context). By construction, I cannot refer to it (in c). But I have just referred to it by ‘the least number I cannot refer to in this context’” (Priest 2004, p.119, fn 13).

Utilizing subscripts in the obvious way, Priest’s penultimate sentence here says that I cannot refer _{c} to the Berry number, i.e. the least number I cannot refer _{c} to. If the use of ‘referred’ in the final sentence is tied to the context c , as Priest presumably intends, then Priest’s final sentence says that I have just referred _{c} to the Berry number. But this sentence is false, because the Berry phrase (‘the least number I cannot refer _{c} to’) has no reference _{c} conditions, just as C has no denotation _{c} conditions. So even if the context is explicitly fixed, the paradox is not reinstated.

There is a grain of truth in what Priest says in the final sentence. The use of the Berry phrase can be evaluated by a reflective schema, and then it may indeed refer to a number. When I produce C , in the context c_C , I have produced an expression that denotes _{c_E} $\pi+6$ – C does denote when evaluated by a reflective schema. That is just to say that C can be rehabilitated.

23. To say, for example, that C is in the extension of ‘denotes _{c_E} ’ is a convenient shorthand. In full, this is to say that C is the first member of an ordered pair in the extension of any occurrence of ‘denotes’ that is represented by ‘denotes _{c_E} ’. In particular, it tells us that C is the first member of an ordered pair that is in the extension of the occurrence of ‘denotes’ in E .

24. See, for example, MacFarlane 2014, Chapter 3. My thanks to Gil Sagi for pressing me on the relation between MacFarlane on assessment-sensitivity and my contextual account – see Sagi (ms).

25. Cresswell, quoted in Lewis 1980, p.30. One target of Cresswell’s remark is Lewis 1970, and Lewis takes Cresswell’s criticism to heart in Lewis 1980.

25. Recanati 2002, p.312.

27. In this chapter, I have considered only contexts that are either unreflective or explicitly reflective. In the next chapter, I’ll treat the notion of reflective status in a more refined way, distinguishing three kinds of contexts: contexts that are unreflective (with respect to a certain expression), contexts that are explicitly reflective, and contexts that are reflective but not explicitly so.

28. Cappelen and Lepore 2003 and 2005.

29. Cappelen and Lepore think that the ICD test and the RCSA are “in effect the same test described in different ways” (2005, p.104). More precisely: “Indeed, an expression e passes the ICD Test just in case it is possible to construct a *Real Context Shifting Argument* involving e ” (Cappelen and Lepore 2005, p. 107).

30. Cappelen and Lepore 2005, p.88

31. *op. cit.*, p.89.

32. See Cappelen and Lepore 2005, pp.90-91.

33. See Cappelen and Hawthorne 2009.

34. Again, as with ‘denotes_{CC}’, this is not to assume that ‘extension’ is context-sensitive: if ‘extension’ is not context-sensitive, the extension remains constant, and the subscript serves no purpose. If ‘extension’ is context-sensitive, then the subscript ‘c_P’ will reappear only if subsequent uses of ‘extension’ inherit the same extension that the context c_P determined for my use of ‘extension’ in P.

35. The same kind of point can be made about a simple hierarchical view, where truth is stratified into levels. Suppose we adopt such a view. Given a liar sentence

(A) A is not true_α,

we suppose that ‘true_α’ is the truth predicate for a language *L* (‘true_α’ applies exactly to the true sentences of *L*), and this predicate is expressible in a metalanguage *M* for *L*, but not in *L* itself. We can say A is not true_α – if it were true_α, it would be assessable by the α-schema, and contradiction would follow. But our assessment of A as not true_α does not lead back to contradiction, because we take it that our repetition of A, along with A, are sentences of *M* that are to be assessed not by the α-schema, but by the schema appropriate for sentences of *M*. Let this be the α+1-schema, applying to exactly the true sentences of *M*, and expressible not in *M* but in a further metalanguage. Then both A and our repetition will be true_{α+1}, since A is not a sentence of *L*, and so not a true sentence of *L* -- that is, A is not true_α.

Compare Russell’s resolution of the falsity liar via a hierarchy of orders of propositions: “Thus our liar will now have to say, ‘I am asserting a proposition of the first order which is false’. But this is itself a proposition of the second order. He is thus not asserting any proposition of the first order. What he says is, thus, simply false, and the argument that it is also true collapses.” (Russell 1959, pp.82-3. See also Russell 1908, in van Heijenoort 1967, p.166.)