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문학석사 학위논문

*A Quinean Critique of Chalmers’
Epistemic Two-Dimensional
Semantics*

차머스의 인식적 이차원주의 의미론에 대한
과인주의적 비판

2015 년 2 월

서울대학교 대학원

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*A Quinean Critique of Chalmers’
Epistemic Two-Dimensional
Semantics*

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Abstract

My master's thesis is a Quinean critique of David Chalmers' semantic theory, epistemic two-dimensional semantics. I criticize his epistemic two-dimensional semantics by providing a Quinean critique of his assumption that there is clear distinction between the *a priori* and the *a posteriori*, which plays a fundamental role in constructing his semantic theory.

In chapter 1, I discuss Chalmers' epistemic two-dimensional semantics, which is intended as a vindication of Fregean semantics, and the role of the *a priori* in the vindication. I argue that it is paramount to define an expression's primary intension, which plays Fregean sense roles, and that the definition of primary intensions fundamentally depends on the assumption that there is the *a priori/a posteriori* distinction.

In chapter 2, I examine Chalmers' response to Quine's attack on the *a priori*. According to Chalmers' understanding of Quine's attack, Quine argues that every sentence is revisable (revisability), and thus there is no distinction between the *a priori* and the *a posteriori*. Against Quine's argument, Chalmers attempts to draw the principled distinction between revisability involving conceptual change and the one without conceptual change. He then argues that revisability is consistent with the *a priori/a posteriori* distinction, and thus Quine's attack on the *a priori* fails.

In chapter 3, I scrutinize Quine's critique of Carnap's *a priori* relative to a language in "Two Dogmas of Empiricism". I argue that Carnapian distinction between the *a priori* and the *a posteriori* is repudiated by two Quinean doctrines, epistemological holism and underdetermination of theory by evidence.

In chapter 4, I will provide a Quinean critique of Chalmers' rejoinder to Quine's attack on the *a priori* and of Chalmers' semantic theory. The two Quinean doctrines imply that there is no distinction between the *a priori* and the *a posteriori*. On the basis of this implication, I argue that Chalmers' rejoinder fails and moreover his semantic theory would be repudiated.

Key Words: Epistemic Two-Dimensional Semantics, Fregean Semantics, Apriority, Revisability, Conceptual Change, Bayesian Epistemology, Epistemological Holism, Underdetermination of Theory by Evidence, Chalmers, Quine, Carnap

Student Number: 2012-20048

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Introduction

In my master's thesis, I will critically investigate David Chalmers' distinctive semantic theory, epistemic two-dimensional semantics, in light of a Quinean critique of the *a priori*. In other words, my thesis will provide a Quinean critique of the distinction between the *a priori* and the *a posteriori*, which plays a fundamental role in constructing Chalmers' semantic theory, and thereby will criticize his semantic theory.

Chalmers (Chalmers 2002a, 2002b, 2004, 2006, Chalmers and Jackson 2001) advocates epistemic two-dimensional semantics, according to which every expression has two kinds of intension: one is the familiar post-Kripkean intension, what he calls 'secondary intension', which would be understood as a function from possible worlds considered as counterfactual to extensions of an expression; the other is an epistemic intension, what he calls 'primary intension', which would be understood as a function from possible worlds considered as actual to extensions of an expression.

The most distinctive claim of Chalmers' semantic theory is that every expression has a primary intension, which is strongly tied to cognitive significance and moreover determines the extension in each possible world considered as actual. In this respect, the primary intension restores the Fregean sense, and thus his semantic theory is regarded as a philosophical movement to defend Fregean semantics. Therefore, it is crucially

important for Chalmers to define and defend primary intension. In his recent book, *Constructing the World* (2002), Chalmers actually makes an attempt to provide a foundation in defining primary intensions on the basis of the distinction between the *a priori* and the *a posteriori*.

However, W. V. O. Quine, in his paper, “Two Dogmas of Empiricism” (1953; 1980), powerfully argues against the distinction between the *a priori* and the *a posteriori*. Since the *a priori/a posteriori* distinction is indispensable in constructing his epistemic two-dimensional semantics, Chalmers (2011, 2012) makes an attempt to refute Quine’s argument against the distinction. He understands Quine’s argument as arguing that no sentence is immune to revision (revisability); but *a priori* sentences are unrevisable if they exist; therefore, there is no *a priori* sentence. To rebut the argument, Chalmers distinguishes revisability involving conceptual change from the one without conceptual change, and then, on the basis of this distinction, insists that there are *a priori* sentences are revisable

However, I will argue that Chalmers’ argument against Quine’s attack on the *a priori* is repudiated by two Quinean doctrines, epistemological holism and underdetermination of theory by evidence, which are found in “Two Dogmas”. Epistemological holism claims that every sentence has cognitive significance only in a theory, taken as a whole, which explains our sense-experience about the world better than other theories. Underdetermination of theory by experience claims that a

uniquely best theory is not determined solely by evidence. These two doctrines imply that every sentence would be justified in the same way, or every sentence would be justified when it is a part of a theory, which successfully explains our sense-experience about the world better than any rival theory. From this, it follows that there is no distinction between the *a priori* and the *a posteriori*. The argument, which is constructed from the two Quinean doctrines, refutes Chalmers' response to Quine's attack on the *a priori*, thereby threatening Chalmers' philosophical project in defending Fregean semantics.

My master's thesis has four chapters. In chapter 1, I will discuss Chalmers' epistemic two-dimensional semantics and the role of the *a priori* in his semantics. In our discussion, we will come to know that Chalmers' epistemic two-dimensional semantics is a semantic theory, which aims to defend Fregean semantics. In Chalmers' project, it is paramount to define an expression's primary intension, which plays a role both in cognition and in determining the extension of the expression. Our discussion also reveals that Chalmers' work to define primary intensions fundamentally depends on the assumption that there is the *a priori* which is clearly distinguished from the *a posteriori*.

In chapter 2, I will examine Chalmers' response to Quine's attack on the *a priori*. Quine (1953; 1980) argues against the *a priori/a posteriori* distinction. Chalmers understands Quine's attack on the *a priori* as an argument that *a priori* sentences should be unrevisable while *a posteriori*

sentences are revisable; but no sentence is immune to revision; therefore there is no distinction between the *a priori* and the *a posteriori*. Against Quine's attack, Chalmers attempts to draw the principled distinction between revisability involving conceptual change and the one without conceptual change. He then argues that revisability involving conceptual change is consistent with the distinction between the *a priori* and the *a posteriori*, and thus Quine's argument from revisability fails.

In chapter 3, I will scrutinize Quine's critique of the *a priori* in "Two Dogmas". I will especially focus on Quine's critique of Carnap's relativized *a priori*. In the scrutiny, we will come to know that the two doctrines, epistemological holism and underdetermination of theory by evidence, together imply that there is no *a priori/a posteriori* distinction. The discussion of this chapter provides the essential elements needed to refute Chalmers' argument in chapter 2.

In Chapter 4, I will provide a Quinean critique of Chalmers' response to Quine's attack on the *a priori* and of Chalmers' epistemic two-dimensional semantics. Chalmers argues that the principled distinction between revisability involving conceptual change and the one without conceptual change can be drawn, and the distinction is consistent with the *a priori/a posteriori* distinction. But I will argue that the two Quinean doctrines, epistemological holism and underdetermination of theory by evidence, together imply that there is no distinction between revisability involving conceptual change and the one without conceptual change, and

thus there is no distinction between the *a priori* and the *a posteriori*. The two Quinean doctrines also threaten Chalmers' semantic theory itself because his semantic theory is fundamentally grounded in the *a priori/a posteriori* distinction.

Chapter 1

Epistemic Two-Dimensional Semantics and the *A Priori*

1. Introduction

This chapter is an investigation of Chalmers' epistemic two-dimensional semantics, a version of two-dimensional semantics. Two-dimensional semantics, as a purely formal framework, is a species of possible world semantics. In contrast with the standard possible world semantics, which assigns an extension or truth-value to a linguistic expression relative to one possible world parameter, two-dimensional semantics assigns an extension or truth-value, to a linguistic expression relative to two possible world parameters.

Different kinds of two-dimensional semantics have been suggested according to different interpretations of two possible world parameters for different explanatory purposes.¹ Among them, Chalmers' epistemic two-

¹ David Kaplan and some logicians have developed two-dimensional semantics, which would be used to analyze restricted expressions such as indexical and operators in tense and modal logic. Kaplan (1977) used two dimensional framework to account for conventional rules governing indexical and demonstrative such as 'I', 'that', 'here' which refer to different things depending on the contexts of utterance of the expression. Some logicians working on tense and modal logic suggested two-dimensional semantics, which would be used to analyze the uses of logical operators such as 'now', 'actually, and 'necessarily' (Vlach, F. 1973, Kamp, H. 1971, Åqvist, L. 1973, Segerberg, K. 1973, van Frassen, B. 1977). Robert Stalnaker (1978, 2004) has developed another sort of two-dimensional semantics which can explain assertion and its relation with context. That is, his

dimensional semantics interprets the two possible world parameters as epistemic possible worlds and metaphysical possible worlds. But we should note that this distinction does not imply that there are two kinds of possible worlds. Chalmers' distinction rather corresponds to the two different ways of considering the same set of possible worlds as actual and as counterfactual. In accordance with these two ways of considering possible worlds, Chalmers divides a linguistic expression's intension into epistemic intension, what he calls 'primary intension', and metaphysical intension, what he calls 'secondary intension'. An expression's secondary intension is defined as a function from possible worlds considered as counterfactual to its extensions; an expression's primary intension is defined as a function from possible worlds considered as actual to its extension.

An expression's primary intension is an aspect of meaning, which is knowable *a priori* for a subject solely by analyzing her concept of the expression, and moreover determines the expression's extension in each possible world considered as actual. In this sense, a primary intension is regarded as a sort of meaning in a Fregean sense, and thus Chalmers' epistemic two-dimensional semantics would be regarded as a vindication of Fregean semantics.

two-dimensional semantics aims to provide a pragmatic account of assertion about contingent information by uttering sentences such as 'George Orwell is Eric Blair' which semantically expresses necessary true propositions. His two-dimensional semantics covers all kinds of expressions, and in this respect, his theory is not different from Chalmers' two-dimensional semantics. But Stalnaker's theory is conclusively different from Chalmers' theory in the way that his theory is not committed to a sort of meaning which is knowable *a priori* which Chalmers' theory is committed to.

In order for primary intensions to play Fregean sense-roles, i.e., roles in cognition and in determining extension, the intensions are to be constructed from scenarios representing epistemic possibilities that are highly specific hypotheses about the world, considered as actual, which are not ruled out *a priori* for any rational subject.

Chalmers, in *Constructing the World* (2012), attempts to construct primary intensions which play Fregean sense-roles by vindicating the *A Priori* Scrutability thesis which states that there is a very limited class of true sentences such that for any true sentence *S*, any subject, through idealized reasoning, would be in a position to know *S a priori* from the limited class.

This chapter is organized as follows. First, I will discuss Chalmers' motivation for his epistemic two-dimensional semantics, especially in philosophy of language. In the discussion, we will come to know that his epistemic two-dimensional semantics aims to defend Fregean semantics. In section 3, I will scrutinize Chalmers' *A Priori* Scrutability thesis, which serves as a foundation for his semantic theory. Our discussion in this chapter will show that Chalmers' assumption that there is a clear distinction between the *a priori* and the *a posteriori* plays a crucially important role in constructing his epistemic two-dimensional semantics.

2. Epistemic Two-Dimensional Semantics as Fregean Semantics

Chalmers' epistemic two-dimensional semantics aims to defend Fregean Semantics. But, why does Chalmers aim to defend Fregean semantics? It would be helpful to consider Millian-Russellian semantics, which claims that an expression's meaning is exhausted by its extension. (Mill 1843, Salmon 1986) Gottlob Frege, in his paper, "Über *Sinn* und *Bedeutung*" (1892), refutes Millian-Russellian Semantics. It is intuitively plausible that one believes that the sentence 'George Orwell is George Orwell' is true while at the same time believing that the sentence 'George Orwell is Eric Blair' is false, even though 'George Orwell' and 'Eric Blair' refer to the same person, George Orwell. From this, we can infer either the two identity sentences are not determined as being true or false solely by meanings of its constituents, or there is an aspect of meaning which reflects our cognitive significance of expressions. But our knowledge that 'George Orwell is Eric Blair' intuitively seems to depend on what we mean by 'George Orwell' and by 'Eric Blair'. Frege thus concluded that an expression has an epistemic meaning, what he calls 'sense' as well as an extension, what he calls 'reference'. Fregean senses, however, have been criticized by many contemporary philosophers, especially by meaning externalists. On the other hand, Chalmers thinks that 'Frege was closer to the truth' (Chalmers 2002, p.135). He thus makes an attempt to define epistemic meaning- which serves the roles of Fregean senses.

2.1. The Golden Triangle between Reason, Modality and Meaning

An expression's extension, as we saw, in general, fails to capture a subject's cognitive significance of the expression. For example, even though 'Hesperus' and 'Phosphorus' have the same extension, Venus, the sentence 'Hesperus is Hesperus' obviously seems to be cognitively trivial, while the sentence 'Hesperus is phosphorus' would be cognitively valuable. Frege thus insisted that an expression has a sense which is constitutively connected with cognitive significance. Thus, according to Frege, two expressions are cognitively distinct if and only if they have different senses. In this way, he explained why two identity sentences, ' $a=a$ ' and ' $a=b$ ', are cognitively different even though ' a ' and ' b ' are coextensive. Chalmers formulates this idea in the following manner:

'Fregean Thesis: Two expressions ' A ' and ' B ' have the same senses iff ' $A\equiv B$ ' is cognitively insignificant.'²

(Chalmers 2004, p. 155)

Fregean thesis provides an account of meaning which reflects cognitive significance of an expression. But he said very little about both senses and cognitive significances.

Rudolf Carnap (1947) attempted to account what Fregean senses are, and how they behave. In other words, he suggested a possible world

² Here, ' $A\equiv B$ ' means that ' A ' and ' B ' have the same extension. Thus, ' $A\equiv B$ ' will be identity sentence, ' $A=B$ ', where ' A ' and ' B ' are names; ' $A\equiv B$ ' will be the material biconditional sentence, ' A iff B ', where ' A ' and ' B ' are sentences; and so on.

semantics as an explication of Fregean senses. His strategy is to define the notion of intension in terms of clear notions of extension and of modality in such a way that intensions behave like Fregean senses. Carnap defines an expression's intension as a function from possible cases to extensions. Intuitively, intensions defined in this way seem to behave in a Fregean sense. Let's consider two expressions 'the highest mountain in the world' and 'Mt. Everest'. These two expressions refer to the same extension, Mt. Everest, but their cognitive values are evidently different. Thus, according to the Fregean thesis, they have different senses. In the actual world, Mt. Everest is the highest mountain in the world, and thus 'Mt. Everest' and 'the highest mountain in the world' have the same extension. But they are not necessarily coextensive. For if K2, not Mt. Everest, had been the highest mountain in the world, then 'the highest mountain in the world' would not have referred to Mt. Everest but K2. Then, from Carnap's possible world semantics, it follows that 'Mt. Everest' and 'the highest mountain in the world' do not stand for the same extension in every possible cases, and thus they have different intensions. This is formulated by Chalmers in the following manner:

'Carnapian Thesis: 'A' and 'B' have the same intension iff
' $A \equiv B$ ' is necessary.'

(Chalmers 2004, p. 157)

Recall that Carnap's definition of intensions is intended as an explication of Fregean senses. As Fregean sense is the meaning which is constitutively

connected to reason, intensions should be also constitutively connected to reason. But the Carnapian thesis only warrants the connection between intension and modality. The thesis does not warrant the connection between intensions and reason, which is required for explication of Fregean sense. Kant's claim that all necessary truths are knowable *a priori*, and vice versa, would be helpful for Carnap's purpose. Kant's claim can be formulated as follows:

'Kantian Thesis: A sentence *S* is necessary iff *S* is knowable *a priori*.'

(Chalmers 2004, p. 157)

Now we have arrived at Carnap's explication of sense. The Carnapian thesis, together with the Kantian thesis, implies the following thesis, which claims that there is a close connection between reason, modality, and meaning:

'Neo-Fregean Thesis: Two expressions '*A*' and '*B*' have the same intension iff '*A*≡*B*' is *a priori*.'

(Chalmers 2004, p. 157)

Chalmers thinks that the thesis above provides an explication of Fregean sense. The Fregean thesis draws upon elusive notions, sense and cognitive significance. In contrast, according to Chalmers, the Neo-Fregean thesis depends upon clear notions than the notions of sense and cognitive significance.

Many philosophers have thought that cognitive (in)significance is

closely related with the *a priori* (*a posteriori*). That is, they have thought that if a sentence is cognitively insignificant for a subject, then the sentence is knowable *a priori* for the subject, and if a sentence is cognitively significant for a subject, then the sentence is knowable *a posteriori* for the subject.³ Chalmers agrees with this thought, and moreover he thinks that apriority is a clear notion so that the *a priori/a posteriori* distinction is also clear. Unlike the notion of cognitive (in)significance, we can characterize *a priori* knowledge as being acquired without any dependence on sense-experience, and *a posteriori* knowledge as being ultimately acquired from sense-experience. Chalmers thus regards Carnap's definition of intension in terms of modality, which is connected with apriority (the Neo-Fregean thesis) as an attempt to explicate Fregean senses. He calls the connection between meaning (intension), modality and reason (apriority) which is stated by the Neo-Fregean thesis 'the golden triangle'.

2.2. Kripke's Destruction of the Golden Triangle

There is an easily noticed difference between knowledge about mathematical and logical truths such as $2+2=4$ and the law of the excluded middle, and other branches of knowledge such as knowledge that water = H_2O . Philosophers in general have thought that the former is about

³ Frege, however, thought that there are cognitively significant sentences among *a priori* sentences. In other words, he believed that there are many logical and mathematical sentences, such as Fermat's Last Theorem, which are not cognitively trivial but valuable, even though they are knowable *a priori*. Frege thus thought that the fact a sentence is cognitively significant for a subject does not imply that the sentence is not knowable *a priori* for the subject.

necessary truths while the latter is about contingent truths. But, how do we acquire knowledge about necessary truths? Many philosophers have claimed that if there are necessary truths, then our knowledge about them are acquired without any dependence on sense-experience. Kant nicely stated this claim as follows: all necessary truths are knowable *a priori*, and vice versa (the Kantian thesis). Carnap's explication of sense, i.e. the Neo-Fregean thesis, depends on the Kantian thesis, which was not doubt at the time. But Kripke (1980) argues that there are some identity sentences, which are necessary but knowable *a posteriori*. His claim is based upon his thesis, which states that names and natural kind terms are rigid designators that pick out the same extension in every possible world in which the extension exists. Let's consider two expressions, 'water' and 'H₂O'. Since the two expressions are natural kind terms, according to Kripke, they pick out H₂O in every possible world. From this, it follows that 'Water is H₂O' is necessary true even though the sentence expresses an empirical fact.

The Neo-Fregean thesis, as we saw, depends upon the Kantian thesis. Kripke's argument thus would be understood to refute the Kantian thesis, and thereby to disprove the Neo-Fregean thesis. According to Kripke, two natural terms, 'water' and 'H₂O', have the same extension in every possible world, so that they have the same intension; therefore 'Water is H₂O' is necessarily true. But, if the Neo-Fregean thesis is true, then 'Water is H₂O' is to be knowable *a priori*, even if the sentence is evidently

knowable *a posteriori*. Therefore, it seems to follow that the Neo-Fregean thesis is disproved.

2.3. Epistemic Two-Dimensional Semantics and the Golden Triangle

Kripke may be considered to have destroyed the golden triangle by cutting the Kantian link between modality and reason. But he kept intact the connection of meaning and modality. Thus, philosophers who are sympathetic to Kripke have suggested that an expression's intension is a function from possible worlds to extensions (Kripkean intension). Chalmers aims to restore the golden triangle, but he does not deny the existence of Kripkean intensions. He thus suggests a semantic theory that satisfies the Neo-Fregean thesis, compatible with Kripkean intension. His core idea is that there are not only metaphysical possibilities which correspond to ways of considering the set of possible worlds as counterfactual, but also epistemic possibilities which corresponds to ways of considering the same set of possible worlds as actual. He then defines two kinds of intension, according to the two kinds of ways of considering possible worlds. First, he defines an expression's epistemic intension, what he calls 'primary intension', as a function from possible worlds considered as actual to the expression's extensions. Next, he defines an expression's Kripkean intension, what he calls 'secondary intension', as a function from possible worlds considered as counterfactual to extensions of

the expression.

Chalmers argues that the existence of primary intensions vindicates the golden triangle between meaning (primary intension), modality (epistemic possibilities) and reason (apriority). The restoration of the golden triangle depends on the following thesis:

Core Thesis: For any sentence S , S is *a priori* iff S has a necessary primary intension, that is, S is true in every epistemic possibility.⁴

Let's suppose that the Core thesis holds. Then for any sentence S , S has one of the following structures: 'All A s are B s, and vice versa', where ' A ' and ' B ' are predicates, or ' a is identical to b ', where ' a ' and ' b ' are names, or ' T iff U ', where ' T ' and ' U ' are sentences. Then, from the compositionality of meaning which states that the meaning of a complex expression is functionally determined by its structure and meaning of its constituents, we get the following thesis:

Neo-Fregean Thesis (Chalmers version): Two expressions ' A ' and ' B ' have the same primary intension iff ' $A=B$ ' is *a priori*.⁵

Let's consider ' $4+6=1+9$ ' which evidently seems to be *a priori*. Suppose that the Core thesis is true. Then ' $4+6=1+9$ ' has a necessary primary intension, and thus ' $4+6$ ' and ' $1+9$ ' have the same primary intension by the compositionality of meaning. Then, it follows that the Neo-Fregean thesis

⁴ Cf. Chalmers, "Epistemic Two-Dimensional Semantics", p. 165

⁵ Cf. Chalmers, "Epistemic Two-Dimensional Semantics", p. 166

is true. Chalmers thus needs to vindicate the Core thesis in constructing his epistemic two-dimensional semantics.

3. *A Priori* Scrutability Thesis: A Foundational Thesis for Epistemic Two-Dimensional Semantics

In the previous section, we saw that for Chalmers it is crucially important to vindicate the Core thesis, and in order to vindicate the Core thesis, he needs to define primary intensions in terms of apriority. In other words, he needs to define primary intensions in scenarios which represent epistemic possibilities, i.e. highly specific hypotheses about the worlds considered as actual that are not excluded *a priori* for any rational subject. Chalmers (2012) in fact sets out foundational works for such a definition of primary intensions. That is, he attempts to demonstrate the *A Priori* Scrutability thesis, which claims that there is a scenario such that for any true sentence *S*, a subject, through idealized reasoning, would be in a position to know *a priori*, the conditional that if the sentences of the scenario obtain, then *S*.

3.1. Reviving the *Aufbau*-like Project: *A Priori* Scrutability

Chalmers, in *Constructing the World* (2012), attempts to revive an *Aufbau*-like project. He says,

In many ways, Carnap is the hero of this book. Like the other twentieth-century logical empiricists, he is often dismissed as a proponent of a failed research program.

But I am inclined to think that Carnap was fundamentally right more often than he was fundamentally wrong. I do not think that he was right about everything, but I think that many of his ideas have been underappreciated. So one might see this project, in part, as aiming for a sort of vindication.

(Chalmers 2012, x vii)

Chalmers thinks that Carnap was fundamentally right in the sense that he argued for a sort of Scrutability thesis that every truth is scrutable from a class of basic truths. Chalmers, however, disagrees with Carnap on 1) which kinds of truths are basic and 2) how every truth is scrutable from basic truths.

Chalmers understands Carnap's project in *Der Logische Aufbau der Welt* (1967) as a sort of construction project, which claims that all concepts deployed in knowledge can be constructed from the single primitive concept of the relation of phenomenal similarity, which holds among immediately given experiences, along with logical truths.⁶ Equivalently, this construction project can be understood as the following form of reductionism: every concept employed in knowledge is reducible, by the aid of logic, to the single primitive concept of the relation of phenomenal similarity, holding among immediate experiences. Carnap accepted the result of Gestalt psychology about immediately given experience, as a result, he counted what is immediately given as the total experience of one moment. Hence, he thought of phenomenal similarity as a sort of relation between

⁶ See Chalmers, *Constructing the World*, p.3.

total experiences that a subject had at different times.

We need to note that Carnap's reduction or construction program requires a sort of eliminative definition. Carnap in fact says, 'An object (or concept) is said to be reducible to one or more objects if all statements about it can be transformable into statements about these other objects' (Carnap 1967, p.6). Carnap's construction project thus can be defined in terms of basic concepts, that is, of logical concepts and phenomenal concepts. Chalmers thus claims that Carnap in the *Aufbau* was committed to the following thesis:

Definability: There is a compact class of primitive expressions such that every expression is definable in terms of expressions of the compact class.⁷⁸

The above thesis allows us to connect sentences in different words, and thereby to get the following Scrutability thesis:

Definability Scrutability: There is a compact class such that all true sentences are knowable, via adequate definition sentences, form the compact class.⁹

Then, Carnap's project in the *Aufbau* can be understood to vindicate the following form of the Definability Scrutability thesis:

Carnapian Scrutability: All true sentences are in principle knowable, via adequate definition sentences, from

⁷ See Chalmers, *Constructing the World*, p. 3.

⁸ Chalmers means 'a compact class' as a class which involves only a small number of expressions, and thus can avoid all trivial inferences.

⁹ See Chalmers, *Constructing the World*, p. 5.

phenomenal and logical true sentences.¹⁰

Many philosophers have criticized the Carnapian Scrutability thesis.¹¹ Chalmers also does not agree with the thesis itself because of the following reasons: first, he thinks that the class of logical truths and phenomenal truths cannot be compact, or that such truths are not enough to infer all truths even for an idealized reasoner; second, he thinks that the Carnapian method of scrutability, which requires definitions, is too strong. But he thinks the idea that all truths are scrutable from basic truths is fundamentally right. He thus attempts to revise the Carnapian Scrutability thesis so that the revised Scrutability thesis can demonstrate that all knowledge about the world is reductively explained by basic truths about the world.¹² He first expands the Carnapian basic truths into PQTI truths-P: physical truths, Q; phenomenal truths, T: ‘that’s all’ truths, I: indexical truths, in such a way that the resulting basic truths can do the work they need to do. Next, he weakens the scrutability method by replacing ‘definitionally scrutable’ in the Carnapian Scrutability thesis into ‘*a priori* scrutable’. Chalmers insists that the revised thesis can achieve Carnap’s aim in the *Aufbau* that all knowledge about the world can be reductively explained in terms of basic truths. This revised thesis is the PQTI Scrutability thesis, which is one sort

¹⁰ See Chalmers, *Constructing the World*, p. 6.

¹¹ There have been two kinds of criticisms to the Carnapian Scrutability thesis. The first argues that Carnapian basic truths cannot do what they need to do. We can find this kind of criticism in Chisholm 1948, Goodman 1952, Newman 1928, and Quine 1953; 1980. The second argues that the Carnapian method of scrutability is too strong. This sort of criticism is found in Kripke 1980, Quine 1953; 1980, Waismann 1945, and Wittgenstein 1953.

¹² See Chalmers, *Constructing the World*, pp. 7-12.

of the *A Priori* Scrutability thesis. They can be formulated respectively as follows:

***A Priori* Scrutability:** There is a compact class such that for any truth *S*, any subject, through idealized reasoning, would be in a position to know, if every truth of that class obtains, then *S*, without any dependence on sense-experience.¹³

PQTI Scrutability: There is PQTI truths such that any subject, through idealized reasoning, would know *a priori* all truths from PQTI truths.¹⁴

We understand and use many expressions very well, even though we in fact do not have any definition of the expressions. For example, although ‘knowledge’ and ‘justice’ are not definable in terms of more primitive expressions, we usually understand and use the terms very well. Thus, such cases would be a threat to the Definability Scrutability thesis, but Chalmers claims that the cases would not be a problem for the *A Priori* Scrutability thesis because the thesis does not rest on explicit conceptual analysis involving definitions. He examines Gettier’s counter-example.

Smith believes with justification that Jones owns a Ford. Smith also believes that Jones owns a Ford or Brown is in Barcelona, where this belief is based solely on a valid inference from his belief that Jones owns a Ford. Jones does not own a Ford, but as it happens, Brown is in Barcelona.

(Chalmers 2012, p. 13)

Let the above scenario be *G*, and ‘Smith knows that Jones owns a Ford or

¹³ See Chalmers, *Constructing the World*, pp. 58-59.

¹⁴ See Chalmers, *Constructing the World*, p. 22.

Brown is in Barcelona' be K . Given G , it seems obvious that almost any subject, with rational reasoning, would know that K is false. However, if the Definability Scrutability thesis is true, then even a subject who can do idealized reasoning, should not be able to know that if G then $\sim K$. For G does not contain the term 'know' or its cognates, and thus there is no definition sentence about 'know'. But it seems obvious that any rational subject would infer that K is false from G . From this, it follows that the Definability Scrutability thesis, including the Carnapian Scrutability thesis, is false. On the other hand, the *A Priori* Scrutability thesis does not require explicit conceptual analysis. Thus, the Gettier case would not be a threat to the *A Priori* Scrutability thesis because the thesis allows that a subject infer $\sim K$ from G , without further empirical information, even if there were no explicit analysis of the concept of 'knowledge'.

Then, does Chalmers claim that the *A Priori* Scrutability thesis does not involve conceptual analysis at all? That is, does he assert that conceptual analysis is not required for reductive explanations? No, he just insists that explicit conceptual analysis is not necessarily required for reductive explanations, but he does not object to the idea that conceptual analysis is necessarily required for reductive explanations. The *A Priori* Scrutability thesis in fact suggests the alternative model of conceptual analysis. Chalmers, with Frank Jackson, actually suggested the alternative model of conceptual analysis as follows:

When given sufficient information about a hypothetical scenario, subjects are frequently in a position to identify the extension of a given concept, on reflection, under the hypothesis that the scenario in question obtains. [...] What emerges as a result of this process may or may not be an explicit definition, but it will at least give useful information about the features in virtue of which a concept applies to the world.

(Chalmers and Jackson 2001, p. 322)

If something like this is right, then possession of a concept such as 'knowledge' or 'water' bestows a conditional ability to identify the concept's extension under a hypothetical epistemic possibility, given sufficient information about that epistemic possibility and sufficient reasoning. That is, possession of these concepts in a sufficiently rational subject bestows an ability to evaluate certain conditionals of the form $E \rightarrow C$ where E contains sufficient information about an epistemic possibility and where C is a statement using the concept and characterizing its extension, for arbitrary epistemic possibilities. And conceptual analysis often proceeds precisely by evaluating conditionals like these.

(Chalmers and Jackson 2001: 324)

In the above, Chalmers, with Jackson, argues that conditional analysis as a conditional ability to identify the extension of a given concept, under the assumption that sufficient information about a hypothetical epistemic possibility is given, is sufficient for a reductive explanation. We need to note that their conceptual analysis should be carried out *a priori*, and this requires that an analyzed concept is knowable *a priori*. Let's consider the following two reductive explanations for water that Chalmers and Jackson can provide:

[Earth]

(P1) 60 percent of the Earth is covered by H₂O.

- (P2) H_2O = the waterish stuff
- (P3) Water = the waterish stuff [conceptual analysis]
- (C1) Therefore, H_2O = water
- (C2) Therefore, 60 percent of the Earth is covered by water.

[Twin Earth]

- (P1) 60 percent of the Twin Earth is covered by XYZ.
- (P2) XYZ = the waterish stuff
- (P3) Water = the waterish stuff [conceptual analysis]
- (C1) Therefore, XYZ = water
- (C2) Therefore, 60 percent of the Twin Earth is covered by water.

The two arguments above show that C1, an ordinary macroscopic truth, is *a priori* scrutable from the conjunctions of the following truths: P1, an empirical micro-physical truth, P2, an *a priori* truth, and P3, an empirical macro-physical truth. P2 plays a crucial role in the two arguments. C2 is *a priori* scrutable from given premises. That is, C2 is deducible solely from given premises, without any further information, only when P3 is knowable *a priori*. For if not, C1 is not deducible *a priori* from P2 and P3, and thus C2 is not deducible *a priori* from P1 and C1. From this, it follows that the existence of *a priori* truths is necessarily required for Chalmers and Jackson's reductive explanation. For the *A Priori* Scrutability thesis, which is indispensable in their reductive explanation, would not be obtained without *a priori* truths.

3.2. *A Priori* Scrutability and Epistemic Two-Dimensional Semantics

We saw that the *A Priori* Scrutability thesis serves as a foundation for the reductive explanation. The thesis also plays a foundational role in

constructing primary intension, which satisfies the Core thesis, and thereby in defending Fregean semantics. An expression's primary intension is defined as a function from scenarios to its extensions. But, what is a scenario? According to Chalmers, a scenario is intuitively understood as a conjunction of sentences, which states 'a maximally specific way the world might be, for all we know *a priori*' (Chalmers 2012, p. 234). More precisely, a conjunction of sentences is a scenario just in case that the conjunction satisfies following two conditions: first, it should be epistemically possible, or its negation should be ruled out *a priori*; second, it should be epistemically complete, that is, for any sentence *G*, there should be no *G* such that the conjunction & *G* and the conjunction & $\sim G$ are epistemically possible. From this, we can know that the *a priori* plays an indispensable role in constructing scenarios.

The *A Priori* Scrutability thesis can be generalized to the following thesis:

Generalized *A Priori* Scrutability: There is a compact class such that every epistemically possible sentence is scrutable from some epistemically possible subclass of the compact class.¹⁵

The above thesis implies that a compact class is partitioned into epistemically possible subclasses. A scenario thus can be understood as an equivalence class of epistemically complete sentences in the compact class.

Chalmers employs scenarios and the Generalized *A Priori*

¹⁵ See Chalmers, *Constructing the World*, p. 235.

Scrutability thesis to construct primary intensions, and thereby defend Fregean semantics. A sentence's primary intension is then defined as a function from scenarios, which amount to possible worlds considered as actual, to its truth-values. From this, we can get the Core thesis, which claims that any sentence *S* is knowable *a priori* for a subject iff its primary intension is true for the subject at every scenario.

We so far examined how Chalmers constructs primary intensions from the *A Priori* Scrutability thesis. His ultimate goal is to defend Fregean semantics. He thus needs to show that primary intensions behave like Fregean senses. That is, he needs to prove that the intensions play roles in cognition and in determining extension. Let's consider Frege's example, 'Hesperus is Phosphorus'. Suppose that a subject utters that sentence. Then, 'Hesperus is Phosphorus' is not *a priori* because the primary intension of the sentence will be false at some scenarios in which Mars satisfies the description of 'Hesperus' while Venus satisfies the description of 'Phosphorus'. Then, it follows that 'Hesperus' and 'Phosphorus' have different primary intensions by the compositionality of meaning. Then, since 'Hesperus' and 'Phosphorus' also have different senses, primary intensions can be said to behave like Fregean senses. The general claim of this is that the Neo-Fregean thesis saying that 'two expressions (in context) have the same primary intension if and only if they are *a priori* equivalent' (Chalmers 2012, p.246). According to Chalmers, primary intensions also play another crucial role as Fregean senses. An

expression's primary intension, as we saw, is defined as a function from scenarios to its extensions. This implies that an expression's primary intension can functionally determine its extensions if a scenario is given. For example, given the twin Earth scenario, the primary intension of 'water' yields XYZ as its extension while the primary intension yields H₂O as its extension if the Earth scenario is given.

Chalmers aims to define primary intensions which can serve Fregean sense's roles, especially roles in cognition and in determining an expression's extension. To achieve his goal, he should prove the Core thesis, which claims that every sentence is knowable *a priori* for a subject iff its primary intension is true for the subject at every scenario. Chalmers undoubtedly assumes the existence of *a priori* sentences which are significantly distinct from *a posteriori* sentences, and then he attempts to construct primary intensions from the *a priori* in such a way that the intensions reflect the distinction between the *a priori* and the *a posteriori*. Thus, we can conclude that the notion of apriority plays an indispensable role in defining primary intensions, and thereby in defending Fregean semantics.

Chapter 2

Chalmers' Critique of Quine's Attack on the *A Priori*

1. Introduction

In the previous chapter, we discussed Chalmers' distinctive semantic theory, epistemic two-dimensional semantics, according to which any expression can be associated with two kinds of intensions. One is the familiar post-Kripkean intension, what he calls 'secondary intension' which is a function from possible worlds considered as counterfactual to extensions. The other is an epistemic intension, what he calls 'primary intension' which is a function from possible worlds considered as actual to extensions. His distinctive claim is that primary intension satisfies some properties of the Fregean sense. That is, he claims that an expression's primary intension plays roles in cognition and in determining its extension. Thus, it is paramount for Chalmers to construct primary intension in such a way that it behaves in a Fregean sense. He thinks that if we demonstrate the Core thesis, which claims that a sentence is *a priori* iff its primary intension is true at every scenario, then primary intensions satisfy most of the properties of Fregean senses. What we need to note is that he takes for granted the existence of the *a priori* which is distinguished from the *a posteriori*. He attempts to define primary intensions from scenarios and

the Generalized *A Priori* Scrutability thesis, which are constructed from the notion of apriority.

However, there have been some objections to the existence of the *a priori*. Quine especially, in “Two Dogmas of Empiricism” (1953; 1980), provides a powerful argument against the distinction between the *a priori* and the *a posteriori*. Chalmers thus at least needs to rebut Quine’s argument against the existence of *a priori* sentences in order to justify his epistemic two-dimensional semantics, which he attempts. (Chalmers 2011; 2012)

In what follows, I will discuss Chalmers’ critique of Quine’s attack on the *a priori*. I will first examine how Chalmers understands Quine’s attack on the *a priori*. I think that Chalmers understands Quine’s attack as follows: If there are *a priori* sentences, then those sentences are to be unrevisable; but every sentence is in principle revisable; therefore, there are no *a priori* sentences. Chalmers’ strategy is to show that the fact that every sentence is revisable is consistent with the distinction between the *a priori* and the *a posteriori*. He thus claims that there are *a priori* sentences that are revisable. In section 3, I will discuss Chalmers’ starting point of his critique. His critique of Quine’s attack on the *a priori* has been developed from Grice and Strawson’s argument that cases of revision involving conceptual change are distinguished from those involving conceptual constancy; this distinction is compatible with the *a priori/a posteriori* distinction. But their argument is successful only when the distinction

between cases of revision involving conceptual change and those involving conceptual constancy can be principally drawn. Chalmers thus attempts to give a criterion for the principled distinction between cases of revision involving conceptual change and those involving conceptual constancy. In the next section, I will explore Chalmers' reconstruction of Carnap's account of intension. According to Chalmers, we can find a basic idea of the distinction in Carnap's dispositional account of an expression's intension. Chalmers thinks that Carnap's account itself cannot provide the required criterion, but Carnap's idea is fundamentally right. So he makes an attempt to revise Carnap's account in such a way that the revised account can distinguish, in principle, cases involving conceptual change from those involving conceptual constancy. This account, however, presupposes the notion of apriority, which he aims to prove. Chalmers thus attempts to provide a criterion for the principled distinction between cases of revision involving conceptual change and those involving conceptual constancy, without presupposing the *a priori*. In the final section of this chapter, I will scrutinize Chalmers' master argument against Quine's attack on the *a priori* in which he uses Bayesian epistemology which is regarded as a good formal account of how an epistemic subject updates her belief about some outcome conditional on another outcome. He claims that his account demonstrates that revisability of sentences is compatible with the distinction between the *a priori* and the *a posteriori*, and thus Quine's argument that revisability implies that there is no *a priori/a posteriori* distinction is not

valid.

2. Chalmers' Understanding of Quine's Attack on the *A Priori*

Quine, in "Two Dogmas", criticizes logical empiricists' adherence to the following two bad dogmas:

Dogma1. All true statements are divided into analytic statements which are grounded in meanings independently of matters of fact and synthetic statements which are grounded in both facts and its meanings.

Dogma2. Every significant synthetic statement is equivalent to a statement which consist of words refer to immediate experience logically.¹⁶

According to some received understanding of the "Two Dogmas", the paper is organized as follows: Dogma 1 is mostly discussed in sections 1-4. Quine there presents the circularity argument that all our attempts to make sense of the analytic requires prior understanding of the analytic so that we cannot give any adequate definition of the analytic, and thus our use of the analytic is not legitimate. Many philosophers, however, have been unmoved by this argument. For they have thought the argument requires too strong of a presupposition that a notion is intelligible only when there is an explicit noncircular characterization of the notion. Quine discusses Dogma 2 in section 5. He there criticizes the logical empiricists' reductionist program. He then in the final section presents empiricism without dogmas, and also provides an argument against the distinction

¹⁶ See Quine, "Two Dogmas of Empiricism", p. 20.

between the analytic and the synthetic. I think that Chalmers' understanding of the "Two Dogmas" is almost identical to the received understanding.

Quine's criticism against Dogma 1 can be understood as the criticism against the distinction between the *a priori* and the *a posteriori* as well as the criticism against the distinction between the analytic and the synthetic. If a sentence is determined as true only in virtue of its meaning, and thus the sentence is knowable solely by grasping its meaning, then the sentence would be said to be knowable *a priori*. In other words, if a sentence expresses a conceptual truth, then the sentence would be said to be both analytic and *a priori*. On the other hand, if a sentence is determined as true because of both a particular empirical fact and its meaning, and hence knowledge of the sentence requires the empirical fact, then the sentence would be said to be knowable *a posteriori*. For this reason, I think that Chalmers focuses on Dogma 1.

Many philosophers think that Quine's most influential argument is found in the final section of "Two Dogmas", which Chalmers addresses. He especially notes the following second paragraph in the final section:

If this view is right, it is misleading to speak of the empirical content of an individual statement – especially if it is a statement at all remote from the experimental periphery of the field. Furthermore it becomes folly to seek a boundary between synthetic statements, which hold contingently on experience, and analytic statements, which hold come what may. Any statement can be held true come what may, if we make drastic enough adjustment

elsewhere in the system. Even a statement very close to the periphery can be held true in the face of recalcitrant experience by pleading hallucination or by amending certain statements of the kind called logical laws. Conversely, by the same token, no statement is immune to revision. Revision even of the logical law of the excluded middle has been proposed as a means of simplifying quantum mechanics; and what difference is there in principle between such a shift and the shift whereby Kepler superseded Ptolemy, or Einstein Newton, or Darwin Aristotle?

(Quine 1953; 1980, p.43)

Chalmers understands Quine's attack on the distinction between the *a priori* and the *a posteriori* to be founded upon the following thesis:

Q. 'No statement is immune to revision.'

Let's suppose that one claims that *a priori* sentences are immune to revision while *a posteriori* sentences are revisable contingently on experience, and thus, there is a clear distinction between the *a priori* and the *a posteriori*. *Q* then refutes this claim. *Q* says that no sentence can be regarded as an *a priori* sentence. It follows that it is folly to attempt to draw a clear distinction between the *a priori* and the *a posteriori*. Thus, Quine's argument can be understood as follows: *Q* implies that there is no distinction between the *a priori* and the *a posteriori*. On the other hand, Chalmers thinks that *Q* is compatible with the *a priori/a posteriori* distinction, and thus *Q* does not imply that there are no *a priori* sentences which are epistemically distinct from *a posteriori* sentences.

3. Grice and Strawson's Response to Quine's Attack on the A

Priori

Chalmers' critique of Quine's attack on the *a priori* starts from Grice and Strawson's response to "Two Dogmas". More specifically, he develops his critique from the following paragraph in their article, "In Defense of a Dogma" (1956):

Now for the doctrine that there is no statement which is in principle immune from revision, no statement which might not be given up in the face of experience. Acceptance of this doctrine is quite consistent with adherence to the distinction between analytic and synthetic statements. Only, the adherent of this distinction must also insist on another, on the distinction between that kind of giving up which consists in merely admitting falsity, and that kind of giving up which involves changing or dropping a concept or set of concepts. Any form of words at one time held to express something true may, no doubt, at another time, come to be held to express something false. But it is not only philosophers who would distinguish between the case where this happens as the result of a change of opinion solely as to matters of fact, and the case where this happens at least partly as a result of a shift in the sense of the words. Where such a shift in the sense of the words is a necessary condition of the change in truth-value, then the adherent of the distinction will say that the form of words in question changes from expressing an analytic statement to expressing a synthetic statement. [...] And if we can make sense of this idea, then we can perfectly well preserve the distinction between the analytic and the synthetic, while conceding to Quine the revisability-in-principle of everything we say.

(Grice and Strawson 1956: 156-7)

Grice and Strawson, in the above paragraph, argue that the acceptance of *Q* is compatible with holding on to the distinction between the analytic (*a priori*) and the synthetic (*a posteriori*) since every sentence is in principle revisable diachronically in virtue of a conceptual change of the sentence, but

this fact does not imply that the sentence before the conceptual change could not be analytic (*a priori*). For a revision involving conceptual change is justified independently of sense-experience while a revision involving conceptual constancy is justified ultimately by sense-experience. For instance, suppose that Tess has a concept <unmarried man> for the expression 'bachelor' at t_1 while a concept <social man> at t_2 for the same expression. In this case, it is plausible to think that if Tess were required to answer the question whether 'All bachelors are unmarried' is true or false, she would say 'true' at t_1 while 'false' at t_2 . We supposed that for Tess, a concept of 'bachelor' is <unmarried man> at t_1 , but <social man> at t_2 . This is obviously a case where conceptual change has occurred between t_1 and t_2 . But the following case is also possible: Tess has possessed the same concept <social man> for 'bachelor' continuously from t_1 to t_2 . This is a case where conceptual change has not occurred. According to Grice and Strawson, an analytic (*a priori*) sentence is the sentence that is immune to revision if conceptual change of the sentence does not occur. In other words, an analytic (*a priori*) sentence is revisable only when conceptual change of the sentence occurs. On the other hands, a synthetic (*a posteriori*) sentence is the sentence which is revisable even where conceptual change of the sentence does not occur. Therefore, they argue that we cannot conclude that Q implies that there is no distinction between the analytic (*a priori*) and the synthetic (*a posteriori*).

However, Grice and Strawson's argument can be successful only

when there is a criterion for the principled distinction between *Q* involving conceptual change and *Q* involving conceptual constancy. Consider the following case: Tess asserted that ‘All bachelors are unmarried’ is true at t_1 but false at t_2 because of some psychological reason even if conceptual change for ‘bachelor’ did not occur. Then, according to Grice and Strawson’s analysis, this case would be one where *Q* occurred regardless of conceptual change, and thus ‘All bachelors are unmarried’ would not be analytic (*a priori*) but synthetic (*a posteriori*), a result Chalmers, as well as Grice and Strawson, would not want to accept. Chalmers, for this reason, tries to present a criterion for the principled distinction between *Q* involving conceptual change and *Q* involving conceptual constancy, and thereby shows that *Q* is compatible with the distinction between the analytic (*a priori*) and the synthetic (*a posteriori*).

4. A Carnapian Response to Quine’s Attack on the *A Priori*

Carnap also, like Quine, agrees with *Q*.¹⁷ But he, unlike Quine, claims that *Q* is compatible with the distinction between the *a priori* and the *a posteriori*. According to Chalmers, we can find a basic idea for the principled distinction between cases of *Q* involving conceptual change and those without conceptual change in Carnap’s works, especially, in “Meaning

¹⁷ Carnap actually says, ‘No statement is immune to revision.’ See Carnap, “Quine on Logical Truth”, p.921. From this, we can judge that revisability itself is not a controversial issue at all on Carnap and Quine’s dispute about the distinction between the analytic (*a priori*) and the synthetic (*a posteriori*).

and Synonymy in Natural Language” (1955). In this article, Carnap argues that an expression’s meaning is its intension, which is determined by a subject’s linguistic dispositions. Thus, according to him, we can investigate an expression’s intension such as the intension of ‘+’ by presenting descriptions of possible cases to a subject and then demanding the subject to judge what ‘+’ applies to. In other words, Carnap insists that an expression’s intension is understood as a function from possible cases to extensions that a subject is disposed to identify in each given case. From this, we can judge that Carnap’s intension is characterized in terms of the naturalistic term, ‘disposition’. For this reason, Chalmers says, ‘If we accept Carnap’s dispositional account of intensions, it follows that *E* undergoes change in meaning between t_1 and t_2 iff there is a possible case such that the speaker is disposed to associate different extensions with *E* when presented with the case at t_1 and t_2 .’ (Chalmers 2012, p. 205) Thus, with the notion of intension defined in this way, we can define the *a priori* as follows: for any sentence *S*, *S* is *a priori* for a given speaker at a given time iff the sentence is true at every possible cases for the given speaker at the time.

Can Carnap’s dispositional account of intension provide a criterion for the principled distinction between cases of *Q* involving conceptual change and those without conceptual change? Chalmers thinks that Carnap’s account itself cannot provide it, but the account has an essential aspect which is associated with it. Thus, he does not dismiss Carnap’s

account altogether; rather he attempts to revise Carnap's account in such a way the revised account can provide a criterion for the principled distinction between cases of Q involving conceptual change and those without conceptual change.¹⁸

Why does Chalmers think that Carnap's account is to be revised? I will examine problems of Carnap's account that Chalmers points out, and then Chalmers' attempt to avoid the problems.

First, let's consider how Carnap distinguishes Q involving conceptual change from Q without conceptual change. Think about 'All cats are animals' which might seem to be paradigmatically *a priori*, as presented by Hilary Putnam (1962). Let's suppose that Nancy asserted that all cats are animals at t_1 , and then acquired evidence that the furry, apparently feline creature on her shoulder is actually a remote-controlled robot from Mars, while all the other creatures she sees are organic, and thus she withdraws her assertion that all cats are animals at t_2 . Let S be 'All cats are animals', and let the above detailed possible case be E .

The above case is an example of revision of an apparently *a priori* sentence, 'All cats are animals'. The issue is whether conceptual change of S affected the revision of S or not. Let's apply Carnap's account of intension into this case. Since Nancy would say that S is false if E were presented to her at t_2 , the intension of S with respect to E would be false at t_2 . Then, what about Nancy's intension for S at t_1 ? Here the key question:

¹⁸ See Chalmers, *Constructing the World*, p. 205.

would Nancy have judged S was true with respect to E if E were presented for her at t_1 before she acquired the evidence which indicates E ?

If Nancy's answer is yes, then, according to Carnap's account of intension, there was no conceptual change of S between t_1 and t_2 , and this is a case where she had an unusual intension for 'cat' all along. On the other hand, if Nancy's answer is no, then Carnap's account suggests that there was a conceptual change of S , and thus Q of S occurred between t_1 and t_2 .

So far, we have examined how Carnap's account of intensions distinguishes Q involving conceptual change from Q without conceptual change. Chalmers thinks Carnap's account is essentially right, but there are some problems in his account. Thus, he attempts to revise the account. For Carnap, as we saw, a sentence is *a priori* iff the sentence is true at all possible cases. But, what are possible cases? Chalmers uses the Generalized *A Priori* Scrutability thesis to define possible cases. The thesis says that there is a compact class of C of true sentences such that all epistemically possible sentences are entailed *a priori* from some epistemically possible subclass of C . From this, Chalmers defines possible cases as equivalent classes of epistemically complete sentences in a compact class of the Generalized *A Priori* Scrutability thesis. Chalmers calls possible cases defined in this way 'scenarios'. According to Carnap's account of intensions, if possible cases that water is H_2O are presented to a subject who does not know that water is H_2O , then the subject will not have any disposition to identify H_2O as the extension of 'water'. But, according

to Kripke (1980), the intension of 'water' is, even for the given subject, H₂O in every possible case. Thus, if Kripke were right, Carnap's dispositional account of intension would be false. Chalmers suggests a solution to this problem by distinguishing primary intension which is based on the epistemic understanding of possibilities, from secondary intensions, which is based on the metaphysical understanding of possibilities. In other words, he attempts to solve the problem by defining primary intension as a function from scenarios as epistemic possibilities to extension which is compatible with Kripke's intension, what Chalmers calls secondary intension: a function from possibilities considered as counterfactual to extensions. Chalmers also points out a subject's mistake as a problem of Carnap's dispositional account of intension. A subject can be mistaken. For instance, it is possible that a subject mistakes that $2+2=5$. Even more, it is possible that the subject has a disposition to always say 'yes' to the question whether $2+2=5$. According to Carnap's account, then ' $2+2=5$ ' is to be *a priori* for the given subject, but this is of course an absurd consequence. To avoid this kind of problem, Chalmers defines the notion of intension in terms of a subject's normatively idealized judgment, instead of a subject's dispositional judgment.¹⁹

Chalmers now defines primary intensions in terms of scenarios, scrutability, and normative idealization in such a way that the defined intensions can avoid the problems Carnap's intension faces. He says, 'The

¹⁹ See Chalmers, *Constructing the World*, pp. 207-11.

(primary) intension of an expression for a subject is a function that maps scenarios to extensions. Given a sentence S and a scenario w specified by a set of sentence D , the intension of S is true at w if S is scrutable from D , false at w if $\sim S$ is scrutable from D , and so on.’ (Chalmers 2012, p. 209)

Chalmers, in this quotation, uses a scrutability framework to define the primary intension. But, what kind of scrutability should be used to define the primary intension? One might hope that if we use the *a priori* scrutability framework to define primary intensions, then we will get a criterion for the principled distinction between cases of Q involving conceptual change and those without conceptual change. That is, one might suggest that for any sentence S , S will be revisable with conceptual change of S between t_1 and t_2 iff there is a scenario, w , such that S is scrutable from w at t_1 but $\sim S$ is scrutable from w at t_2 . However, this is not a good suggestion for Chalmers, because even if this suggestion were successful in drawing the principled distinction, the distinction depends on the contested notion of apriority.

5. A Bayesian Response to Quine’s Attack on the *A Priori*

In the previous section, we saw how Chalmers defines primary intensions in terms of an *a priori* scrutability framework, and then provides a criterion for the principled distinction between cases of Q involving conceptual change and those without conceptual change. But this attempt is unhelpful for Chalmers because it presupposes the contested notion of

apriority which Quine doubts. Chalmers thus exploits Bayesian epistemology, which does not appeal to the notion of apriority, to provide a criterion for the principled distinction between cases of Q involving conceptual change and those without conceptual change, and thereby argues that one who accepts Q can rationally adhere to the distinction between the *a priori* and the *a posteriori*.

Bayesian epistemology is based on the notion of credence and the principle of conditionalization. By Bayesian epistemology, for any proposition S and T , a subject can associate unconditional credence $cr(S)$ and $cr(T)$, and also conditional credence $cr(S | T)$ sometimes. Credences are usually understood as something like a subject's degree of expectation for the truth of a proposition or a hypothesis or etc., and regarded as a kind of probability, i.e., a subjective probability. Thus, it is natural to think of credences as real numbers between 0 and 1 in such a way that a subject has a credence of 1 for a proposition when she is certain that the proposition is true, while the subject has a credence of 0 for a proposition when she is certain that the proposition is false.²⁰

Bayesian epistemology is widely regarded as a good formal theory which explains how a subject updates her belief about an outcome in light of new evidence. In this account, the principle of conditionalization for propositions usually plays a crucial role.

²⁰ Cf. Strevens, "Notes on Bayesian Confirmation Theory", p.7.

CP. If a rational subject has a credence for a proposition S , conditional on another proposition, T at t_1 , $cr_1(S | T)$, and acquires total relevant evidence which support T between t_1 and t_2 , then $cr_2(S)$ should be equal to $cr_1(S | T)$.²¹

If a subject revises her mind about a proposition S conditional on another proposition T , that is, $cr_2(S) \neq cr_1(S | T)$, then there is only one way the subject revises her mind about S , according to *CP*: the subject is irrational. Since Chalmers' goal is to distinguish cases of Q involving conceptual change and those without conceptual change, *CP* is unhelpful for him. Thus, he induces another version of conditionalization, which is useful for his goal. He notes a rational inference rule, Modus Ponens, which states a constitutive connection between rational inference and conceptual continuity: for any sentence S and E , if $E \rightarrow S$ and E , then S . Suppose that a subject violates this rule diachronically. Then, it follows that either if S & E 's meaning did not change, then the subject is irrational, or if the subject is rational, then either the meanings of both S and E changed or one of the sentences changed.

Chalmers, from the constitutive connection between rational inference and conceptual continuity and *CP*, gets the principle of conditionalization for sentences:

CS. If a subject is fully rational, and if the subject acquires total evidence specified by E between t_1 and t_2 , and if the

²¹ '*CP*' stands for 'conditionalization for propositions'.

content of sentence S does not change between t_1 and t_2 ,
then $cr_2(S) = cr_1(S \mid E)$.

(Chalmers 2012, p. 213)

CS , unlike CP , can distinguish cases of Q involving conceptual change from those without conceptual change. In other words, according to CS , there are two ways a subject revises her mind about a sentence S : the content of S can change or the subject can be irrational. Chalmers identifies the former with a case of Q involving conceptual change of S , and the latter with a case of Q without conceptual change of S .

Chalmers attempts to show that there is a clear distinction between the *a priori* and the *a posteriori* on the basis of the distinction between cases of Q involving conceptual change and those without conceptual change. Let me give two cases: a case of Q involving conceptual change and a case without conceptual change, according to CS .

At first, let's consider a case of Q involving conceptual change, according to CS . Let S be the sentence 'Water is a clear liquid that every human being should drink in order to maintain her existence' and E is the sentence that specifies total relevant evidence indicating that there is a human being who does not need to drink water in order to maintain her existence. Let's also assume that the extension of 'water' is H_2O continuously from t_1 to t_2 . Now suppose that a rational biochemist, Suzie, had a high unconditional credence of S at t_1 , that is, $cr_1(S)$ was high for her; she acquired the total relevant evidence that E specifies between t_1 and t_2 ; after acquiring the total evidence, her unconditional credence of S at t_2 ,

$cr_2(S)$ was low. Then, does Suzie's case of Q involve conceptual change or not? Chalmers suggests to consider the following question: What is her credence of S conditional on E at t_1 , i.e. $cr_1(S | E)$? Suppose that $cr_1(S | E)$ is high. This case then violates CS . We assumed that Suzie acquired the total relevant evidence that E specifies between t_1 and t_2 , and she is rational. Then, from CS , it follows that the meaning of S changed between t_1 and t_2 , and thus this case falls under Q involving conceptual change. In other words, according to Chalmers, we can plausibly conclude that Suzie changed the concept for 'water' from <a clear liquid that every human being should drink in order to maintain her existence> at t_1 to <a clear liquid that some human being does not need to drink in order to maintain her existence> at t_2 , and thus she had a high unconditional credence of the conceptual matter that water is a clear liquid that every human being should drink in order to maintain her existence that S expresses at t_1 ; after conceptual change of 'water', she had a low credence of the empirical matter that water is a clear liquid that every human being should drink in order to maintain her existence that S expresses at t_2 . Thus, according to Chalmers, 'Water is a clear liquid that every human being should drink in order to maintain her existence' could be *a priori* for Suzie at t_1 , even though the sentence was revised between t_1 and t_2 .

Next, consider a case of Q without conceptual change, according to Chalmers. Let S be the sentence, 'Water is H_2O ', and E be the sentence

that specifies total relevant evidence indicating that every human being should drink XYZ, not H₂O in order to maintain her existence. Now suppose that a rational business man, Tylor, who does not know advanced chemistry at all, had a high unconditional credence of S at t_1 , that is, $cr_1(S)$ is high for him; he acquired total relevant evidence that E specifies between t_1 and t_2 ; and then he had a low unconditional credence of S at t_2 , that is, $cr_2(S)$ was low for him. In this case, according to Chalmers, the diagnostic question to judge whether Tylor's revision on S does involve conceptual change or not, is the following question: what is his credence of S conditional on E at t_1 , $cr_1(S | E)$? If $cr_1(S | E)$ is low, then $cr_2(S) = cr_1(S | E)$, and thus Tylor's rejecting of S in light of E accords with CS. Since we assumed Tylor is rational, and he acquired total relevant evidence that E specifies, we can conclude that the meaning of S expresses the empirical truth that water is H₂O continuously from t_1 to t_2 , and thus, Tylor's revision of S does not involve conceptual change of constituents of S . Thus, this case is an instance of Q without conceptual change, due to CS. According to Chalmers, we can conclude that 'Water is H₂O' did not express a conceptual truth, and thus the sentence was initially not an *a priori* sentence.

Chalmers thinks that we can draw the principled distinction between cases of Q involving conceptual change and those without conceptual change on the basis of CS. According to him, the first case belongs to Q involving conceptual change, and the second case belongs to Q without conceptual change. On the grounds of this distinction, Chalmers

argues that Q is compatible with the distinction between the *a priori* and the *a posteriori*, and thus Quine's attack on the *a priori* fails.

Chapter 3

Reconsidering Quine's Critique of the *A Priori* in "Two Dogmas of Empiricism"

1. Introduction

In the previous chapter, we examined how Chalmers responds to Quine's attack on the *a priori*, namely, Quine's argument in the final section of "Two Dogmas". Chalmers understands the argument as follows: Quine argues that *a priori* sentences, if they exist, are to be unrevisable; but no sentence is in principle immune to revision; therefore there are no *a priori* sentences. On the other hand, Chalmers argues that there are *a priori* sentences which are revisable, contrary to Quine. He employs Bayesian epistemology to distinguish revisability of sentences into two kinds: one involving conceptual change and one without conceptual change. After distinguishing these two kinds of revisability, he argues that revisability is compatible with the *a priori/a posteriori* distinction, and thus revisability does not imply that there is no such a distinction. Carnap, like Chalmers, held that there are *a priori* sentences which are revisable. That is, he claimed that a sentence is *a priori* relative to a language. But his claim holds only when revision involving language change is epistemically

distinguished from revision without language change.²²

In this chapter, I will reconstruct Quine's argument against the *a priori* in "Two Dogmas" such that the reconstructed argument refutes Carnap's relativized *a priori*. The argument is based in two Quinean doctrines, epistemological holism and underdetermination of theory by evidence. This argument will shed light on why Chalmers' response to Quine's attack on the *a priori* fails.

I will organize this chapter as follows. First, I briefly discuss some historical background of Quine's discussion on the analytic, for a better understanding of Quine's argument against the *a priori*. In section 3, I examine how the absolute *a priori* is refuted by epistemological holism. In the next section, I show that Carnap's relativized *a priori* is repudiated by the two Quinean doctrines, epistemological holism and underdetermination of theory by evidence. The two doctrines also refute Chalmers' apriority, which will be dealt with in my final chapter. In the final section of this chapter, I discuss how Quine can explain the epistemic status of logic and mathematics, which obviously appears to be different from experimental sciences such as physics, psychology, etc.

2. Some Background for Quine's Attack on the *A Priori*

Quine, in "Two Dogmas", seems to argue merely against the

²² My concern for Carnap in this chapter is to explain the extent that his philosophy influenced Quine, not to provide a comprehensive account of Carnap's philosophy itself.

analytic, especially, the logical empiricists' conception of the analytic. But "Two Dogmas" has a powerful argument against the *a priori*. Perhaps, it would be helpful to start with some historical background for Quine's discussion on the *a priori* and the analytic. Consider supposedly necessary truths such as mathematical and logical truths. We seem to know necessary truths such as $2+2=4$. If knowledge of necessary truths is possible, then such knowledge, unlike knowledge of contingent truths such as Germany winning the 2014 World Cup, does not seem to depend on sense-experience at all. Then, how can we know necessary truths? Broadly speaking, rationalists in general have insisted that we human beings have rational intuitions, which are used to know necessary truths, without any dependence on sense-experience. According to rationalists, our knowledge of necessary truths is substantial knowledge about the world, but the existence of rational intuition seems no less mysterious than the existence of necessary truths. On the other hand, empiricists in general reject the existence of rational intuition, claiming that all substantial knowledge is ultimately based on sense-experience. Thus, they have insisted that our knowledge of necessary truths is nothing more than knowledge constructed from our operations of existing ideas that are formed by sense-experience. The empiricists' account of necessary truths is less mysterious than the rationalists' account, but makes our knowledge of necessary truths somewhat trivial.

Kant thought that there are both substantial and trivial knowledge of

necessary truths. He held that all necessary truths are knowable *a priori*, and vice versa, and thus he attempted to settle the question of how we can know necessary truths by resolving the question of how *a priori* knowledge is possible. According to him, *a priori* knowledge is divided into two kinds: one is *a priori* knowledge of analytic truths, which do not seem to be mysterious, but trivial; the other is *a priori* knowledge of synthetic truths, which seem to be substantial, but is in need of an account of how synthetic *a priori* knowledge is possible. Kant took for granted the existence of synthetic *a priori* knowledge. That is, he believed that we can find synthetic *a priori* knowledge in mathematics, namely, arithmetic and geometry.²³

Logical empiricists, including Carnap, however, completely rejected the possibility of synthetic *a priori* knowledge by sorting Kant's main examples of synthetic *a priori* knowledge into either analytic *a priori* knowledge or synthetic *a posteriori* knowledge. In other words, they classified arithmetic as analytic *a priori* by reflecting on the results of logicism, developed by Frege and Russell, but geometry as synthetic *a posteriori* by reflecting on non-Euclidean Geometry and theory of relativity.

Frege's logicism is a philosophical claim that arithmetic is reducible to logic by some adequate definitions, and thus arithmetical truths are analytic. It presupposes that a sentence is analytic just in case it is reducible, through some adequate definition, to a logical truth. Frege

²³ See Kant, *Critique of Pure Reason*, B15 and B16.

thought that definition sentences are true by its meaning. Thus, for Frege, an analytic sentence is true in virtue of its meaning and logical truths. But, what is the nature of logical truths? Frege actually does not discuss much this question. Rather, logical empiricists answered that logical truths are true solely in virtue of the meaning of the logical constants such as ‘and’, ‘or’, etc. Thus, for logical empiricists, a sentence is analytic when the sentence is true solely in virtue of its meaning. Therefore, logical empiricists held that the analytic is coextensive with the *a priori*, and moreover, the former accounts for the latter. According to them, analytic sentences do not make an assertion about the world at all, and thus they are knowable without any dependence on sense-experience such that they are true no matter what.²⁴ With this background, Quine’s argument against the analytic would be understood as one against the *a priori*.²⁵

3. No Absolute *A Priori*

Quine, in sections 1-3 of the “Two Dogmas” thoroughly examines whether the notion of meaning is legitimate or not. He there argues that there is no principled reason to believe in meanings, and thus in the *a priori*, which is true purely in virtue of meanings. We may suspect that Quine’s argument is not enough to warrant that there is no principled reason to

²⁴ But this account of analyticity (apriority), as we will see shortly, is not exactly applied to Carnap’s analyticity (apriority). For his analyticity (apriority) is not an absolute notion, and thus analytic (*a priori*) sentences, like synthetic (*a posteriori*) sentences, are in principle revisable. But he also held that the analytic is coextensive with the *a priori*, and moreover the former accounts for the latter.

²⁵ Cf. Burgess, “Quine’s Philosophy of Logic and Mathematics”, pp. 282-83.

believe in meanings. But, even if Quine's argument is successful, his argument does not rule out the possibility of the existence of meanings, and thus of the distinction between the *a priori* and the *a posteriori*. For example, even if there were an argument, which warrants that there is no principled reason to believe in irrational numbers such as $\sqrt{2}$, the argument does not rule out the possibility of the existence of irrational numbers. Similarly, we still do not have a principled reason to reject the absolute *a priori* completely.

Quine provides an argument against the absolute *a priori* in the last section of "Two Dogmas". He says,

If this view is right, it is misleading to speak of the empirical content of an individual statement – especially if it is a statement at all remote from the experimental periphery of the field. Furthermore it becomes folly to seek a boundary between synthetic statements, which hold contingently on experience, and analytic statements, which hold come what may. Any statement can be held true come what may, if we make drastic enough adjustment elsewhere in the system. Even a statement very close to the periphery can be held true in the face of recalcitrant experience by pleading hallucination or by amending certain statements of the kind called logical laws. Conversely, by the same token, no statement is immune to revision. Revision even of the logical law of the excluded middle has been proposed as a means of simplifying quantum mechanics; and what difference is there in principle between such a shift and the shift whereby Kepler superseded Ptolemy, or Einstein Newton, or Darwin Aristotle?

(Quine 1953; 1980, p.43)

Now, Quine can refute the *a priori*, which is unrevisable. The supposed

distinction between the *a priori* and *a posteriori* is grounded in the uncritical assumption of the existence of meanings. If we assume the existence of meanings, then *a priori* sentences, which are held to be true come what may, are distinguished from *a posteriori* sentences, which are held to be true contingently on sense-experience. But epistemological holism states that ‘our statements about the external world face the tribunal of sense experience not individually but only as a cooperative way’. (Quine 1953; 1980, p. 41) In other words, all sentences have implications for sense-experience not individually but only within a theory which consists of logically interconnected sentences. Thus, whenever a subject does have a new sense-experience, the subject may revise her belief about any other sentences in light of the new experience. In other words, every sentence is in principle revisable. Epistemological holism states that no sentence is immune to revision, and thus it reposes the distinction between the *a priori*, which is unrevisable and the *a posteriori*, which is revisable.

4. No Relativized *A Priori*

Epistemological holism demonstrates that there is no *a priori* sentence whose truth-value is unrevisable, and thus there is no distinction between the *a priori* and the *a posteriori*. But Carnap held that every language consists of semantic rules, and further claimed that semantic rules are primary *a priori* sentences, and all other *a priori* sentences follow from

these semantic rules.²⁶ Thus, for Carnap, an *a priori* sentence is relative to language, and therefore the sentence is revisable on the choice of language. If we change our language, then some sentences, which were regarded as *a priori* in the old language, may not be counted as *a priori*, or some other sentences, which were not regarded as *a priori*, may be counted as *a priori*. Carnap's distinction between the *a priori* and the *a posteriori* requires the epistemic distinction between the choice of language and the choice of theory within a language change. The epistemic distinction between the two choices plays an indispensable role in completing the two goals of Carnap's philosophical project: disposing of metaphysics and explaining the epistemic status of logic and mathematics. In "Two Dogmas", Quine explicitly does not provide an argument against Carnap's relativized *a priori*, but we can construct the argument from the two Quinean doctrines, epistemological holism and underdetermination of theory by evidence.

Carnap, in his paper, "Empiricism, Semantics, and Ontology"

²⁶ Carnap's semantic rules are intended as an explication of the ordinary vague notion of analyticity. Quine criticizes this attempt. Carnap thinks that if we have an exact artificial language, having explicit semantic rules, then we can have the precise notion of analyticity, which is relative to the particular artificial language. He thinks that in doing so, a clear distinction between the analytic and the synthetic can be drawn. Then, a sentence *S* for Carnap is said to be analytic for a particular artificial language *L*, according to a rule of which begins with 'A sentence *S* is analytic for some language *L*₀ if and only if ...' Quine, however, argues that our understanding of such a rule requires our prior understanding of an ordinary notion of analyticity, which is to be explicated. Carnap of course can give another explication of the notion of analyticity as follows: A sentence *S* is analytic for a particular artificial language if the sentence is true according to a semantic rule of the language. But the notion of semantic rule, according to Quine, is as much to be clarified as the notion of analyticity. (Quine, 1953; 1980, pp. 32-37)

(1950), makes an attempt to dispose of metaphysics. In other words, he argues that metaphysical disputes, which has traditionally been considered as substantial issues about the world, such as the realism/anti-realism dispute, in fact, are nothing more than practical matters about the choice of language, which is to be made on the basis of pragmatic standards such as clarity, simplicity, convenience, efficiency, etc. He thus insists that metaphysical disputes are not theoretical matters which are right or wrong. But his anti-metaphysical claim is grounded in the epistemic distinction between the choice of language and the choice of theory within a language. In other words, he claims that metaphysical claims are not theoretical matters on the grounds that the choice of language, i.e. the choice of semantic rules, which serve to resolve questions that are raised within a language, is not a theoretical matter; on the other hand, the choice of theory within a language can be right or wrong. This epistemic distinction is based on Carnap's understanding of the distinctive role of language in knowledge. He understands language, including logic, to play a framework role in knowledge. That is, according to Carnap, our knowledge is possible only within a language framework. All languages have semantic rules, and thus the choice of language involves the choice of semantic rules. When there is a disagreement about the choice of theory under the presupposition of a language, the matter in principle can be theoretically resolved because the language has rules for resolving the matter. On the other hand, when there is a disagreement about the choice

of language, there are no such rules for settling the dispute, and thus no choice of language can be right or wrong. The epistemic distinction also serves to account for the supposedly *a priori* status of logic and mathematics, compatible with the empirical claim that all knowledge about the world is based on sense-experience. According to Carnap, we choose a language on the basis of pragmatic factors. Moreover, he insists that logic and mathematics constitute a language, and thus the choice of logic and mathematics amounts to the choice of language. In this way, he explains the supposedly *a priori* status of logic and mathematics while holding on to empiricism.

Now, let's further explore Carnap's conception of apriority. For Carnap, the *a priori* is relative to language, and thus *a priori* sentences are revisable on the choice of language, but they are unrevisable without language change. On the other hand, *a posteriori* sentences are revisable contingently on the factual elements, regardless of language change. We can then define *a priori* and *a posteriori* sentences respectively in terms of revision and language change. *A priori* sentences are those sentences that are not immune to revision without language change. On the other hand, *a posteriori* sentences are those sentences that are revisable regardless of language change. But this distinction requires the epistemic distinction between the revision involving language change and the one without language change. That is, the distinction holds only when the change of language is not subject to confirmation or disconfirmation by evidence,

while the change of theory within a language is subject to confirmation or disconfirmation by evidence.

However, the epistemic distinction between the revision involving language change and the one without language change is repudiated by the two Quinean doctrines, epistemological holism and underdetermination of theory by evidence.

The totality of our so-called knowledge or beliefs, from the most casual matters of geography and history to the profoundest laws of atomic physics or even of pure mathematics and logic, is a man-made fabric which impinges on experience only along the edges. Or, to change the figure, *total science is like a field of force whose boundary conditions are experience. A conflict with experience at the periphery occasions readjustments in the interior of the field.* Truth values have to be redistributed over some of our statements. Re-evaluation of some statements entails re-evaluation of others, because of their logical interconnections - the logical laws being in turn simply certain further statements of the system, certain further elements of the field. *Having re-evaluated one statement we must re-evaluate some others, whether they be statements logically connected with the first or whether they be the statements of logical connections themselves. But the total field is so undetermined by its boundary conditions, experience, that there is much latitude of choice as to what statements to re-evaluate in the light of any single contrary experience.* No particular experiences are linked with any particular statements in the interior of the field, except indirectly through considerations of equilibrium affecting the field as a whole.

(Quine 1953; 1980, pp. 42-43, *emphases added*)

Epistemological holism states that the evidential relation holds between theories, which are made up of logically interconnected sentences, and experience, not between individual sentences and experience.

Underdetermination of theory by evidence states that no evidence can determine a uniquely best theory. Let's suppose that a chemist observed a greenish tint in a test-tube and then asserted the sentence, 'There is copper in the test-tube'. Now, let's suppose that a religious person, who believes in angels, and does not know chemistry at all, observed a greenish tint in a test-tube, and then asserted the sentence, 'There are two angels in the test-tube'.²⁷ If we assume that their physical abilities such as eye sight, and the observation environment were about the same, then their observations were probably much the same. Then, it follows that the evidence, which indicates that there is a greenish tint in a test tube, does not bear on an individual sentence such as 'There is a copper in a test-tube', or 'There are two angels'. Rather, the evidence bears on a theory including chemistry or a study of angels. We can also know, from our thought experiment, that evidence itself does not determine a uniquely best theory, which successfully deals with our sense-experience. Of course, if we pretty much observe the same thing, then most of us will choose chemistry as the best theory, which deals with our observation better than a study of angels. But our choice would be made on the basis of pragmatic criterion such as prediction, convenience, fruitfulness etc., which, according to Carnap, are used only to settle disputes about the choice of language.

The two Quinean doctrines imply that there is no unique relation

²⁷ See Quine, *Word and Object*, pp. 10-11.

Cf. Hylton, "Analyticity and Holism in Quine's Thought", p. 15.

between a theory and evidence. The two doctrines imply that pragmatic factors play an indispensable role both in the revision involving language change and in one without language change. Then, from the two Quinean doctrines, we get a criterion for justification of a theory as follows: our acceptance (or choice or revision) of a theory would be justified when the theory explains our sense-experience of the world better than any rival theory. But this does not mean that we cannot speak of epistemic status of individual sentences. From the two doctrines, we can say about justification of individual sentences in the following manner: for any sentence, our acceptance (or choice or revision) of a sentence would be justified when doing so contributes to some parts in a best theory about our sense-experience of the world. This implies that disputes about the choice of language, unlike Carnap's claim, are also theoretical matters, which are associated with substantial knowledge about the world. The two doctrines thus demonstrate that there is no epistemic distinction between the revision involving language and the one without language change, and thus there is no distinction between the *a priori* and the *a posteriori*.

Some may argue that there is no place for justification in Quine's naturalized epistemology. Quine, in his later writing, "Naturalized Epistemology" (1969), argues that traditional epistemology, whose primary task is to prescribe standards to science as a whole outside of science, is to be abandoned; instead, we should do our study of knowledge within science itself. But J. Kim (1988) criticizes that Quine's epistemology is just a

purely empirical study of causal relation between sensory input and cognitive output, and thus, it completely rules out the study of epistemic normativity such as justification in epistemology. Quine, however, does not agree with Kim's characterization of his naturalism. In other words, he claims that his naturalized epistemology does not imply that the study of epistemic normativity should be given up. He actually says,

Naturalization of epistemology does not jettison the normative and settle for the indiscriminate description of ongoing procedures. For me normative epistemology is a branch of engineering. It is the technology of truth-seeking [...] it is matter of efficacy for an ulterior end, truth [...] The normative here, as elsewhere in engineering, becomes descriptive when the terminal parameter is expressed.

(Quine 1986, pp.664-65)

From this, we can know that Quine regards epistemic normativity as the normativity of instrumental reason. Thus, according to him, a subject's revision of her belief about a theory or a sentence, etc., would be justified when doing so would be the effective means to her ends. I think Quine's claim that we should do our study of knowledge within science itself would be understood as a claim that our theoretical study of epistemic normativity including justification is to be informed by science, including physics, mathematics, psychology, and history, etc. He simply rejects a sort of study, which seeks to prescribe *a priori* principles of epistemic normativity to science. Of course, it is a controversial issue whether there is a place for epistemic normativity such as justification in Quine's philosophy as a whole. But my concern here is not to provide a comprehensive account of how we

should read Quine's whole philosophical system. Rather, my goal here is to reconstruct Quine's argument against the *a priori* from epistemological holism and underdetermination of theory by evidence, and I think that we can at least get a criterion for justification of a theory or a sentence from the two doctrines.

5. What is the Distinctive Epistemic Status of Logic and Mathematics?

Carnap insisted that all substantial knowledge about the world can be constructed from sense-experience. But we seem to know logical and mathematical theorems without any dependence on sense-experience. That is, our knowledge of them seems to depend on proofs rather than experiments. In this sense, logic and mathematics seem to be clearly different from natural science such as physics, astronomy etc. Thus, many philosophers have attempted to account for this difference by introducing the distinction between the *a priori* and the *a posteriori*. Carnap also attempted to explain the difference in terms of the *a priori/a posteriori* distinction. His attempt, as we saw, is grounded in the epistemic distinction between the choice of language and the choice of theory within a language. But the two Quinean doctrines, epistemological holism and underdetermination of theory by evidence, negate this epistemic distinction.

The two Quinean doctrines, however, do not merely imply that Carnap's attempt is not sufficient to account for the distinction between the

a priori and the *a posteriori*. The two doctrines rather imply that every sentence would be justified in the same way, and thus there is no distinction between the *a priori* and the *a posteriori*. Thus, logic and mathematics are for Quine not different in kind from other branches of knowledge such as physics, biology, etc.

Mathematics and logic are supported by observation only in the indirect way that those aspects of natural science are supported by observation; namely as participating in an organized whole which, way up at its empirical edges, squares with observation. I am concerned to urge the empirical character of logic and mathematics no more than the unempirical character of theoretical physics; it is rather their kinship that I am urging, and a doctrine of gradualism.

(Quine 1966; 1976, p. 121)

However, there seems to be an easily noticed seeming difference between them. Quine thus needs to provide an account for the seeming difference, while rejecting the *a priori/a posteriori* distinction. Then, what is the obvious seeming difference between the *a priori* and the *a posteriori*? Logic and mathematics, unlike almost any other sorts of knowledge, are not practically abandoned. In other words, we do not in fact revise our mind about well-established laws of logic and mathematics even when we acquire some counter-examples of such laws.

The two Quinean doctrines can explain the practical unrevisability of logic and mathematics on the basis of the generality of them in our whole knowledge system. Quine thinks that logic and mathematics are so deeply implicated with all branches of our knowledge system, and thus they are

indispensable in every part of a best theory about the world. We can count any objects we can think of. Logic is a study of laws about how we should think, and arithmetic is applied to every object that is countable.²⁸ Thus, the revision of well-established logic and mathematics will result in a monstrous revision of every branch of our knowledge system. This means that the revision requires us to abandon our whole theory of the world, and thus to reconstruct a totally new knowledge system from the most fundamental level up. Thus, the revision of logic and mathematics will result in great damage, which can never be compensated by any resulting benefit from the revision.²⁹ Quine thus claims that, even if we in principle can abandon established logic and mathematics, the revision will not happen. This explains why we do not practically revise our well-established logic and mathematics on the basis of pragmatic factors such as simplicity, efficiency, fruitfulness, etc. In this way, Quine can account for the easily noticed difference between the supposedly *a priori* knowledge, in particular logic and mathematics and the supposedly *a posteriori* knowledge such as physics, while rejecting the principled distinction between the *a priori* and the *a posteriori*.

²⁸ See Frege, *The Foundation of Arithmetic*, pp. 20-21.

²⁹ See Quine, *Philosophy of Logic*, pp. 7, 86, 100.

Chapter 4

A Quinean Counterattack on Chalmers' Critique of Quine's Attack on the *A Priori*

1. Introduction

In chapter 3, I discussed in detail Quine's critique of the *a priori* in "Two Dogmas of Empiricism". His critique is systematically composed of several arguments. One of the arguments refutes the claim that *a priori* sentences do not make an assertion about the world at all, so that they are held to be true no matter what, and thus they are neither confirmed nor disconfirmed by evidence; on the other hand, *a posteriori* sentences do make an assertion about the worlds, so that they are held to be true contingently on experience, and thus they are subject to confirmation or disconfirmation by evidence. Therefore, the *a priori* is clearly distinguished from the *a posteriori*. Quine, however, refutes this sort of claim on the ground of epistemological holism, which claims that every sentence is in principle revisable. Epistemological holism implies that there are no *a priori* sentences which are unrevisable.

Some philosophers such as Carnap, Grice and Strawson, and Chalmers, have responded to Quine's argument above. They commonly argue that one who accepts that every sentence is in principle revisable can consistently hold on to the distinction between the *a priori* and the *a*

posteriori, on the ground that cases of revision involving language change (conceptual change) can be distinguished from those without language change (conceptual change), and the former corresponds to the *a priori* and the latter corresponds to the *a posteriori*. That is, they insist that there are *a priori* sentences that are revisable. This kind of argument is repudiated by the two Quinean doctrines, epistemological holism and underdetermination of theory by evidence.

Quine's major target in "Two Dogmas" is Carnap's conception of the *a priori*. For Carnap, the *a priori* is not an unrevisable notion, that is, the *a priori* is relative to language. He defines *a priori* and *a posteriori* sentences respectively in terms of revision and language change as follows: a sentence is *a priori* when the sentence is unrevisable without language change; a sentence is *a posteriori* when the sentence is revisable regardless of language change. Carnap's distinction is grounded in the epistemic distinction between the choice of language and the choice of theory within a language. However, the two Quinean doctrines demonstrate that the distinction between the two revisions is useless for the *a priori/a posteriori* distinction. The two doctrines imply that there is only one single criterion for justification of theories or sentences: our acceptance (or choice or revision) of a theory would be justified when the theory explains our sense-experience better than any rival theory; our acceptance (or choice or revision) of a sentence would be justified when it contributes to some parts of a best theory about our sense-experience about the world. This means

that every sentence would be justified in the same way. From this, it follows that there is no distinction between the *a priori* and the *a posteriori*, and thus the distinction between revision involving language change and the one without language change has no epistemic significance.

The purpose of this chapter is twofold. The first is to counter Chalmers' argument against Quine's attack on the *a priori* by arguing that the two Quinean doctrines demonstrate that the distinction between revision involving conceptual change and the one without conceptual change cannot be drawn, and thus Chalmers' critique of Quine's attack on the *a priori* fails. Not only that, I will try to show that the two doctrines would undermine a foundation of Chalmers' semantic theory, epistemic two-dimensional semantics. As we saw in chapter 1, the distinction between the *a priori* and the *a posteriori* plays an absolutely crucial role in constructing his epistemic two-dimensional semantics, which intends to defend Fregean semantics. Chalmers thinks that the distinction between the *a priori* and the *a posteriori* mostly corresponds to the distinction between cognitive insignificance and cognitive significance, and moreover, he thinks that the *a priori/a posteriori* distinction is clearer than the distinction between cognitive insignificance and significance. He thus attempts to construct his epistemic two-dimensional semantics from the distinction between the *a priori* and the *a posteriori*, and thereby to defend Fregean semantics. The two Quinean doctrines, however, demolish the distinction between the *a priori* and the *a posteriori*. This means that the two doctrines would not

only refute Chalmers' critique of Quine's attack on the *a priori*, but also Chalmers' semantic theory.

I organize this chapter as follows. In the next section, I will reexamine Chalmers' critique of Quine's attack on the *a priori* in chapter 2 in light of the discussions in chapter 3. In section 3, I will rebut Chalmers' critique on the basis of the two Quinean doctrines, epistemological holism and underdetermination of theory by evidence. Finally, I will show how the two doctrines threaten Chalmers' epistemic two-dimensional semantics.

2. Chalmers' Rejoinder to Quine's Attack on the *A Priori*

Quine argues against the *a priori/a posteriori* distinction, which plays a fundamental role in constructing Chalmers' epistemic two-dimensional semantics. Chalmers (2011, 2012) thus attempts to refute Quine's argument against the distinction between the *a priori* and the *a posteriori*. He makes an attempt to draw the principled distinction between cases of revision involving conceptual change and those without conceptual change on the basis of Bayesian epistemology. On the basis of this distinction, he argues that one who accepts that every sentence is in principle revisable is consistently able to adhere to the distinction between the *a priori* and the *a posteriori*.

Chalmers deals with Quine's argument against the *a priori* in the final section of "Two Dogmas". He especially focuses on the second paragraph in the section. Quine there argues that there are no *a priori*

sentences that are unrevisable. In other words, the absolute *a priori* is repudiated by epistemological holism which implies that all sentences have significances for experience only when they are taken together with a theory, made up of logically interconnected sentences. According to epistemological holism, whenever a subject has a new sense-experience, for any sentence *S* she may revise her belief about *S* in order to accommodate the new experience (*Q*). *Q* then says that any sentence can be regarded as *a posteriori*, but no sentence can be regarded as *a priori*. This means that we cannot distinguish *a priori* sentences from *a posteriori* sentences on the basis of *Q*.

Chalmers, however, claims that *Q* does not imply that there is no distinction between the *a priori* and the *a posteriori*. That is, he insists that *Q* is compatible with the existence of *a priori* sentences.

Chalmers notes Grice and Strawson's distinction between *Q* involving conceptual change and *Q* without conceptual change.³⁰ Let's consider the sentence 'All vixens are foxes'. Suppose that Jennifer had a concept <female fox> for 'vixen' at *t*₁, but her concept for 'vixen' changed into <coy animal> between *t*₁ and *t*₂ so that her concept for 'vixen' was <coy animal> at *t*₂; thus she ipso facto changed her mind about the sentence being true at *t*₁ to being false at *t*₂; therefore her revision can be justified solely by her conceptual change for 'vixen'. This case is an instance of *Q* involving conceptual change. Now let's suppose that Jennifer possessed the same

³⁰ See Grice and Strawson, "In Defense of a Dogma", pp. 156-57.

concept <coy animal> for 'vixen' continuously from t_1 to t_2 , but she revised her mind about the sentence in light of some evidence indicating that there are some disobedient vixens, so that this revision cannot be justified independently of sense-experience. Then this is a case of Q without conceptual change. On the basis of this distinction, we can provide a criterion for an *a priori* sentence and an *a posteriori* sentence respectively in the following manner: a sentence is *a priori* for a subject when her revision of the sentence can be justified solely by her conceptual change of the sentence, that is, without any dependence on sense-experience. On the other hand, a sentence is *a posteriori* for a subject when her revision of the sentence cannot be justified independently of sense-experience. From this, one may assert that acceptance of revisability is compatible with the adherence to the *a priori/a posteriori* distinction.

Chalmers agrees with the above claim. That is, he thinks that Q is compatible with the distinction between the *a priori* and the *a posteriori*. He, however, thinks that the above argument is not enough to refute Quine's argument against the existence of *a priori* sentences which are epistemically distinct from *a posteriori* sentences. In other words, he thinks that the argument cannot draw the principled distinction between Q involving conceptual change and Q without conceptual change which is necessary for the distinction between the *a priori* and the *a posteriori*. Let's consider the following case: Jennifer asserted the sentence 'All vixens are female foxes' as true at t_1 but false at t_2 because of some psychological reason, without a

conceptual change of the sentence. If her assertion is justified, then ‘All vixens are female foxes’ is to be *a posteriori*, not *a priori*, according to the above criterion. But this is a result Chalmers would not accept. Chalmers thus makes an attempt to provide a criterion for the principled distinction between cases of Q involving conceptual change and those without conceptual change, and thereby argues that we can hold on to the distinction between the *a priori* and the *a posteriori* while accepting Q .

Bayesian epistemology plays an indispensable role in Chalmers’ critique of Quine’s attack on the *a priori*. The epistemology is usually regarded as a good formal theory which provides a mechanism of how a subject revises her belief about a sentence in light of new evidence. In this sense, Bayesian epistemology is regarded as a formal account of epistemological holism, which states that every sentence is revisable conditional on new evidence. Thus, we can say that Chalmers exploits Bayesian epistemology, which is a formal account of epistemological holism, to attempt to demonstrate that Q is compatible with the distinction between the *a priori* and the *a posteriori*. Bayesian epistemology is based on the notion of credence and the principle of conditionalization. In the epistemology, for any sentences S and E , a subject can associate unconditional credence $cr(S)$ and $cr(E)$, and also associate conditional credence $cr(S | E)$ at times. The principle of conditionalization reflects the following intuition: If a rational subject has a credence for some sentence, S ,

conditional on another sentence, E , at t_1 , i.e. conditional credence, $cr_1(S | E)$, and acquires total relevant evidence specified by the evidence sentence, E , between t_1 and t_2 , then the subject should have an unconditional credence for S at t_2 , i.e. $cr_2(S)$, which is equal to $cr_1(S | E)$. Chalmers also assumes that there is a constitutive connection between rational inference and conceptual continuity. Let's consider a rational inference rule such that for any sentences S and E , if $E \rightarrow S$ and E , then S . If a subject violates this rule diachronically without a change in the meaning of S or E , then the subject would be irrational. On the other hand, if a subject is rational, then the subject would be engaged in conceptual change. On the basis of the principle of conditionalization and the constitutive connection between rational inference and conceptual continuity, Chalmers induces the principle of conditionalization for sentences, from which he attempts to draw the principled distinction between cases of Q involving conceptual change and those without conceptual change. Chalmers formulates the principle as follows:

(CS) If a subject is fully rational, and if the subject acquires total evidence specified by E between t_1 and t_2 , and if the content of sentence S does not change between t_1 and t_2 , then $cr_2(S) = cr_1(S | E)$.

(Chalmers 2012, p. 213)

Chalmers exploits CS to provide a criterion for the principled distinction

between Q involving conceptual change and Q without conceptual change as follows: Suppose that Q holds so that for any sentence S , $cr_1(S) \neq cr_2(S)$. Let's assume that $cr_1(S)$ is high and $cr_2(S)$ is low. Furthermore, assume that a subject s is fully rational, and acquires total evidence specified by E between t_1 and t_2 . Under these assumptions, if $cr_1(S | E)$ is low, then $cr_2(S) = cr_1(S | E)$. This revision is a case of Q without conceptual change according to CS . On the other hand, if $cr_1(S | E)$ is high, then $cr_2(S) \neq cr_1(S | E)$. Thus, according to CS , this revision falls under Q involving conceptual change. Chalmers understands that the former belongs to Q without conceptual change and the latter belongs to Q involving conceptual change.

Chalmers attempts to draw the principled distinction between Q involving conceptual change and Q without conceptual change on the basis of CS , which is grounded in Bayesian epistemology and the constitutive connection between rational inference and conceptual continuity. On the basis of the distinction, he argues that Q is compatible with the *a priori/a posteriori* distinction.

3. A Quinean Critique of Chalmers' Rejoinder to Quine's Attack on the *A Priori*

Chalmers makes an attempt to distinguish, in principle, cases of Q involving conceptual change from those without conceptual change, on the basis of CS which is grounded in both Bayesian epistemology and the existence of conceptual truths. He then argues that cases of Q are compatible with the *a priori/a posteriori* distinction. He in fact provides a criterion for *a priori* and *a posteriori* sentences respectively by using the notions of revision and of conceptual change. Each criterion is as follows: a sentence is knowable *a priori* for a rational subject when her revision of the sentence can be justified only by her conceptual change of the sentence, independently of sense-experience; on the other hand, a sentence is knowable *a posteriori* when her revision of the sentence cannot be justified solely by her conceptual change of the sentence, that is, when justification of her revision requires sense-experience. I note the fact that Chalmers' distinction between the *a priori* and the *a posteriori* depends on the distinction between Q involving conceptual change and Q without conceptual change.

In what follows, I will provide a Quinean argument which refutes Chalmers' distinction between Q involving conceptual change and Q without conceptual change. In other words, I will show how the Quinean refutes Chalmers' critique of Quine's attack on the *a priori*, using the two Quinean doctrines, epistemological holism and underdetermination of theory by evidence. Epistemological holism claims that evidential relation holds between a theory, which is a set of logically connected sentences, and

experience, not between an individual sentence and experience. Or equivalently, we can say that epistemological holism claims that for any sentence *S*, a subject may change her mind about *S* in light of new evidence. Underdetermination of theory by evidence claims that a uniquely best theory is not determined only by evidence. The doctrine rather claims that whenever we confront evidence, we choose a best theory on the basis of pragmatic factors such as convenience, expedience, fruitfulness, etc.

The two Quinean doctrines have the following two implications for epistemology. First, the two doctrines imply that there is no unique relation between a theory and evidence. Second, the two doctrines imply that pragmatic factors play an indispensable role in choosing a theory. From these implications, it follows that there is only one single criterion for justification of a sentence. Our acceptance (or choice or revision) of a sentence would be justified when doing so contributes to some parts of a theory, taken as a whole, which successfully explains our sense-experience better than any rival theory. This implies that there is no sentence which can be justified for any subject independently of sense-experience, and thus there is no revision of a sentence which can be justified for any subject without any dependence on sense-experience. Thus, there is no case of *Q* involving conceptual change. Therefore, the two doctrines imply that there is no distinction between *Q* involving conceptual change and *Q* without conceptual change.

Chalmers assumes a Bayesian epistemology that provides a formal

account of how a rational subject revises her belief about a sentence conditional on new evidence. In this sense, Chalmers' argument would be understood as an attempt to demonstrate that *a priori/a posteriori* distinction is compatible with epistemological holism, which states that every sentence is in principle revisable for any subject in light of new evidence. According to the principle of conditionalization, when a rational subject acquires evidence specified by E , a subject should have her new credence for a sentence S , i.e. $cr(S)$, which is equal to $cr_1(S | E)$. Someone may think that $cr(S | E)$ reflects all facts about the relation between E and S so that E uniquely determines S , but that is not true. Let's suppose that S is the sentence 'There is acid in the test-tube' and E is the sentence 'The litmus paper turned red when the paper was dipped into the tube'. Then, $cr(S | E)$ would be higher than $cr(S)$ for any rational chemist. But for some rational person who does not know modern chemistry at all, and trusts in demonology, which states that the litmus paper turns red in the presence of the devil, $cr(S | E)$ would not be higher than $cr(S)$. It follows that the evidence, which indicates that the litmus paper turned red when the paper was dipped into the tube, does not bear upon the sentence 'There is acid in the test-tube'. Rather, the evidence bears upon a theory, such as chemistry or demonology, etc. Our thought experiment also shows that evidence itself cannot determine a uniquely best theory, which will successfully deal

with our experience. Clearly, upon observing pretty much the same thing, many of us will choose chemistry as the base theory, which will explain our observation better than demonology. But our choice would be made on the basis of pragmatic factors such as predictive power, convenience, fruitfulness, etc. Accordingly, Chalmers cannot refute the two Quinean doctrines on the basis of Bayesian epistemology.

Recall that Chalmers makes an attempt to draw the principled distinction between cases of Q involving conceptual change and those without conceptual change on the basis of Bayesian epistemology. The epistemology, as we saw, would be regarded as a formal account of epistemological holism, and moreover, is compatible with underdetermination of theory by evidence. But the two Quinean doctrines imply that there is no distinction between cases of Q involving conceptual change and those without conceptual change, which means that Chalmers' attempt to draw the distinction is pointless.

Then, how can a Quinean explain facts about a subject's revision of her belief about a sentence conditional on evidence? Should the Quinean reject Bayesian epistemology, especially, the principle of conditionalization? I think that the Quinean does not need to reject the principle. She just needs to amend the principle in the following manner:

(*QCS*). If a rational subject has a credence for some sentence S conditional on total relevant evidence specified by E at t_1 , $cr_1(S | E)$, and acquires the evidence specified by E between t_1 and t_2 , and her belief system, which is relevant

to S has hardly changed from t_1 to t_2 , then $cr_2(S)$ and $cr_1(S | E)$ would be about the same.³¹

QCS is not a sophisticated formulation which reflects all facts about a subject's revision of a sentence conditional on evidence. But the Quinean can provide a plausible account of facts about conditional revisions by using *QCS*, together with the two Quinean doctrines, epistemological holism and underdetermination of theory by evidence. Now let's consider how the Quinean can account for the facts of conditional revision.

Case1. Let S be the sentence, 'Water is a clear liquid that every human being should drink in order to maintain her existence', and E be the sentence that specifies total relevant evidence indicating that there is a human being who does not need to drink water in order to maintain her existence. Assume that the extension of 'water' is H_2O continuously from t_1 to t_2 . Now let's suppose that a rational biochemist, Suzie, had a high unconditional credence of S at t_1 , that is, $cr_1(S)$ was high for her on the basis of a best biochemistry which supports S at that time; she acquired the total relevant evidence that E specifies between t_1 and t_2 ; after acquiring the evidence, her unconditional credence of S at t_2 , $cr_2(S)$ was low. In this case, Suzie would not revise her belief about S on the hypothetical evidence E , that is, $cr_1(S | E)$ would be high, because holding on to S would contribute to a best biochemistry about water at that time. Since $cr_2(S) \neq cr_1(S | E)$, this case is an instance of the violation of *QCS*. We assumed that Suzie is

³¹ '*QCS*' stands for 'Quinean conditionalization for sentences'.

rational and she acquired the total relevant evidence that E specifies between t_1 and t_2 . Thus, we can say that the violation happens because a best chemistry, which is associated with water, still supports S , and moreover, the revision requires a drastic change of her belief system which is associated with S such that she has no reason which can justify the drastic change of her belief system. But a rational subject, Suzie, would revise her belief about S after she actually acquires countervailing evidence E of S , because doing so would contribute to a theory, which successfully deals with E better than any rival theory.

Case2. Let S be the sentence, 'Water is H_2O ', and E be a sentence that specifies total relevant evidence indicating that every human being should drink XYZ, not H_2O in order to maintain her existence. Now let's suppose that a rational business man, Tylor, who does not know advanced chemistry at all, had a high unconditional credence of S at t_1 , that is, $cr_1(S)$ was high for him; he acquired total relevant evidence that E specifies between t_1 and t_2 , and then he had a low unconditional credence at t_2 , that is, $cr_2(S)$ was low for him. In this case, Tylor may have a low credence of S conditional on E at t_1 , that is, $cr_1(S|E)$ may be low because he has no rational reason to adhere to S under the hypothesis that E is given. Thus, if we suppose that $cr_1(S|E)$ is low for Tylor, then this case is compatible with *QCS*. This means that his belief system, which is relevant to S , has hardly changed between t_1 and t_2 . In this case, a rational subject, Tylor, would revise her belief about S after he actually acquires countervailing evidence E

of *S*, because doing so would contribute a best theory, which copes with *E* better than any rival theory.

Chalmers attempts to explain the difference between case1 and case2 by means of the principled distinction between *Q* involving conceptual change and *Q* without conceptual change. But, as we saw, the two Quinean doctrines imply that there are no conceptual truths, and therefore there is no *Q* involving conceptual change. Thus, we need to explain the difference between case1 and case2 in another way. A Quinean can give a required account. According to the Quinean, case1 would be an instance of a rational subject's revision of her belief about a sentence, due to the drastic change of the subject's belief system, which is relevant to the sentence; on the other hand, case2 would be an instance of a rational subject's revision of her belief about a sentence, with very little change of the subject's belief system, which is relevant to the sentence.

To sum up, the two Quinean doctrines, epistemological holism and underdetermination of theory by evidence, demonstrate that the distinction between cases of *Q* involving conceptual change and those without conceptual change cannot be drawn, and thus Chalmers' attempt fails to refute Quine's argument against the distinction between the *a priori* and the *a posteriori*. But my argument does not merely claim that the two Quinean doctrines imply that Chalmers' attempt is not sufficient to warrant the possibility of the distinction between the *a priori* and the *a posteriori*. As we saw, the two Quinean doctrines are compatible with Bayesian

epistemology, which plays an absolutely crucial role in Chalmers' critique of Quine's attack on the *a priori*. However, the two doctrines imply that there is no distinction between the *a priori* and the *a posteriori*; therefore, Chalmers' attempt fails. Epistemological holism, taken with underdetermination of theory by evidence, implies that no sentence would be epistemically different, and thus any attempt to draw the distinction between the *a priori* and the *a posteriori* is useless.

4. A Quinean Doubt about a Fundamental Assumption of Epistemic Two-Dimensional Semantics

In the previous section, I demonstrated that the two Quinean doctrines, epistemological holism and underdetermination of theory by evidence, imply that our acceptance (or choice or revision) of a sentence would be justified in the same way, and thus the supposed distinction between *Q* involving conceptual change and *Q* without conceptual change cannot be drawn. Therefore, Chalmers' argument, which aims to demonstrate that *Q* is compatible with the *a priori/a posteriori* distinction, fails.

The two Quinean doctrines, however, do not merely refute Chalmers' critique of Quine's attack on the *a priori*. The two doctrines would be a threat to Chalmers' semantic theory, epistemic two-dimensional semantics. The distinction between the *a priori* and the *a posteriori* plays a foundational role in constructing Chalmers' epistemic two-dimensional

semantics. The two doctrines, however, imply that no sentence would be different from epistemic point of view, and thus there is no distinction between the *a priori* and the *a posteriori*.

Chalmers' epistemic two-dimensional semantics aims to defend Fregean semantics. A distinctive common feature of all sorts of Fregean semantics is a claim that our cognitive significance of an expression is reflected in its meaning, and thus the cognitive difference of two expressions are reflected in the difference of meanings of the two expressions. As Frege noted in "On *Sinn* and *Bedeutung*", an expression's extension cannot play a role which is associated with cognitive significance. I believe that the sentence 'George Orwell is George Orwell' is true, but I might not believe that the sentence 'George Orwell is Eric Blair' is true even though two names, 'George Orwell' and 'Eric Blair', have the same extension, George Orwell. Thus, if an expression's meaning is exhausted by its extension, then the cognitive difference of the two names cannot be explained by means of the difference in meaning of the two names. Frege, however, thought that when we come to know that the sentence, 'George Orwell is Eric Blair', our knowledge depends on what we mean by 'George Orwell' and by 'Eric Blair'. He thus suggested that there is an aspect of meaning, what he calls 'sense', which is constitutively connected to cognitive significance such that an expression's sense plays a role in knowledge and in inference. Chalmers agrees with Frege's idea that there is an aspect of meaning which has cognitive significance. But he thinks

that Frege's notions of sense and cognitive significance are somewhat unclear. Many philosophers have thought, if a sentence is trivially knowable for a subject, that is, the sentence is cognitively insignificant, then the sentence is knowable *a priori* for the subject. In other words, many philosophers have thought that cognitive (in)significance are closely related to the *a priori* (*a posteriori*). Chalmers adopts this idea, and he also thinks that the notion of apriority is clear and thus the distinction between the *a priori* and the *a posteriori* is also clear. He thus attempts to construct epistemic intension, what he calls 'primary intension', from the *a priori/a posteriori* distinction. But the two Quinean doctrines imply that there is no distinction between the *a priori* and the *a posteriori*. Therefore, the two doctrines can be understood to refute not only Chalmers' rejoinder to Quine's attack on the *a priori*, but also Chalmers' epistemic two-dimensional semantics, which is a semantic theory aiming to defend Fregean semantics.

Conclusion

Let me review what I have discussed so far. Chalmers' epistemic two-dimensional semantics is understood as a defense of Fregean semantics, which claims that every expression has 'sense', a sort of meaning which is associated with knowledge. Chalmers' epistemic two-dimensional semantics aims to defend Fregean semantics, while accommodating meaning externalism by vindicating that every expression not only has 'secondary intension', which is associated with a role in explaining its extensions or its truth-conditions, but also has 'primary intension', which is associated with roles in its cognitive significance and in determining its extension.

However, many contemporary philosophers who are sympathetic to meaning externalism have taken a skeptical stance about the existence of primary intensions, and have provided several critiques of Chalmers' epistemic two-dimensional semantics. Thus, it is paramount for Chalmers to define the primary intension in such a way that the intension is invulnerable to the meaning externalists' criticism. He thus attempts to define the primary intension which is constitutively connected to cognitive significance. It seems plausible that if a sentence is trivially knowable (cognitively insignificant), then the sentence is knowable *a priori*. Thus, it seems plausible that the difference between cognitive insignificance and

significance is strongly associated with the distinction between the *a priori* and the *a posteriori*. Moreover, the notions of *a priori* and *a posteriori* seem clear. Chalmers (2012) thus sets out to provide a foundation for an adequate definition of primary intensions on the basis of the distinction between the *a priori* and the *a posteriori*. In other words, he attempts to vindicate the *A Priori* Scrutability thesis, which claims that any rational subject would be in a position to know all true sentences from a very limited class of true sentences, without any dependence on sense-experience. He then exploits the thesis to define primary intension which reflects the distinction between the *a priori* and the *a posteriori*.

However, Quine (1953; 1980) powerfully argues that there is no distinction between the *a priori* and the *a posteriori*. Chalmers understands Quine's argument against the *a priori* as a claim that *a priori* sentences, if they exist, are to be unrevisable; but every sentence is in principle revisable (revisability). Therefore, there is no distinction between the *a priori* and the *a posteriori*. Against this, Chalmers argues that one who accepts revisability also consistently can adhere to the distinction between the *a priori* and the *a posteriori*. That is, he claims that there are *a priori* sentences that are revisable. He employs Bayesian epistemology to draw the principled distinction between revisability involving conceptual change and one without conceptual change. The former states that there are sentences whose revision is justified solely by conceptual change of the sentences, and thus they are justified

independently of sense-experience. On the other hand, the latter states that there are sentences whose revision requires empirical matters. From this, he argues that this distinction is compatible with the distinction between the *a priori* and the *a posteriori*. He therefore argues that Quine's argument fails to show that revisability implies that there is no distinction between the *a priori* and the *a posteriori*.

In my thesis, I have argued that Chalmers' attempt is unsuccessful. Quine, in "Two Dogmas", suggests two doctrines, epistemological holism and underdetermination of theory by evidence. On the basis of these two doctrines, we can construct a Quinean argument which not only refutes Chalmers' response to Quine's attack on the *a priori*, but also Chalmers' semantic theory. Epistemological holism states that the evidential relation does not hold between an individual sentence and experience, but holds between a theory which is composed of logically interconnected sentences, and experience. Underdetermination of theory by evidence states that there is no uniquely best theory which is determined solely by evidence. These two doctrines imply that there is just only one single criterion for justification of theories or sentences. Acceptance (or choice or revision) of a theory would be justified when the theory successfully explains our sense-experience about the world better than any rival theory; acceptance (or choice or revision) of a sentence would be justified when doing so contributes to a best theory or our sense-experience about the world. From this, it follows that there is no sentence which can be justified for any

subject without any dependence on sense-experience, and thus there is no revision of a sentence which can be justified for any subject independently of sense-experience. Thus, the two Quinean doctrines imply that there is no distinction between Q involving conceptual change and Q without conceptual change, and thus Chalmers' critique of Quine's attack on the *a priori* fails. Furthermore, the two doctrines attack Chalmers' epistemic two-dimensional semantics itself. The *a priori/a posteriori* distinction plays a fundamentally important role in constructing Chalmers' epistemic two-dimensional semantics. The two doctrines, however, imply that no sentence would be different from the epistemological point of view, and thus there is no distinction between the *a priori* and the *a posteriori*. In this sense, my thesis can be regarded as providing a critique not only of Chalmers' rejoinder to Quine's attack on the *a priori*, but also of Chalmers' epistemic two-dimensional semantics.

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국문 초록

이 논문의 목적은 데이비드 차머스가 제시한 인식적 이차원주의 의미론에 대한 콰인주의적 비판을 제공하는 것이다. 다시 말해서, 나는 그의 의미론이 근본적으로 의존하고 있는 선험/후험 구분에 대해 콰인주의적 비판을 제공함으로써, 그의 의미론을 비판한다.

1장에서 나는 프레게주의 의미론으로써 제안된 차머스의 인식적 이차원주의 의미론과 그의 의미론에서 선험성의 역할에 대해서 논의한다. 나는 차머스의 기획 즉, 프레게의 의미론을 옹호하는 기획이 성공하기 위해서는 프레게의 뜻에 준하는 역할을 하는 일차내포가 정의되어야 하며, 일차내포의 정의는 선험/후험 구분이 존재할 때에만 가능함을 논증한다.

2장에서 나는 선험성에 대한 콰인의 공격에 대해 차머스가 한 대응을 검토한다. 차머스가 이해한 콰인의 공격에 따르면, 모든 문장은 수정될 수 있고 (수정가능성), 따라서 선험/후험 구분은 존재하지 않는다. 콰인의 논증에 반대해서, 차머스는 개념변화를 포함하는 수정가능성과 개념변화를 포함하지 않는 수정가능성 사이의 원칙적인 구분을 긋는 시도를 한다. 그리고 이 구분에 근거해서 그는 수정가능성은 선험/후험 구분과 양립가능하며, 따라서 선험성에 대한 콰인의 공격은 실패함을

논증한다.

3장에서 나는 카르납의 선험성 개념 즉, 언어에 상대화된 선험성 개념에 대해서 “경험주의의 두 독단”에서 콰인이 제시한 비판을 면밀히 검토한다. 나는 카르납식의 선험/후험 구분은 콰인의 인식론적 전체론과 증거에 의한 이론의 과소결정성 논제에 의해서 논박됨을 논증한다.

4장에서 나는 선험성에 대한 콰인의 공격에 대해 차머스가 한 대응과 차머스의 의미론에 대한 콰인주의적 비판을 제공한다. 인식론적 전체론은 증거에 의한 이론의 과소결정 논제와 함께 선험/후험 구분이 존재하지 않음을 함축한다. 이 함축에 근거해서, 나는 차머스의 대응이 실패함을 보이며 또한 그의 의미론을 논박한다.

주요어: 인식적 이차원주의 의미론, 프레게주의 의미론, 선험성, 수정가능성 논제, 개념변화, 베이즈주의 인식론, 인식론적 전체론, 증거에 의한 이론의 과소결정성 논제, 차머스 콰인, 카르납

학번: 2012-20048