Actualism or Possibilism: A Grounding Approach

by

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Abstract

Linsky and Zalta present a possible way to reconcile the Barcan Formula with actualism by positing contingently non-concrete objects. However, it has been argued that an actualism based on the existence of contingently non-concrete objects is not genuinely actualist, because contingently non-concrete objects are nothing but proxies, or a different label for possible objects. In this thesis, I will argue for another possible approach—truthmakers as alternative sources of explanation— to argue that Linsky and Zalta's account is an actualist theory. I will adapt Schaffer's truthmaker monism to Zalta's theory of abstract objects in order to show that we can have a logical system that can represent worlds as the truthmakers of propositions. Then, I will argue that the way we constructed the truthmakers in the Object Theory is parallel to other actualist reductions of possible worlds, and some of the naturalist accounts. Lastly, I will argue that Linsky and Zalta's metaphysics can be considered as an actualist one when it is combined with abstract worlds as the grounds of modal truths, since the abstract worlds are necessary and actual beings.

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Introduction

Linsky and Zalta present a possible way to reconcile the Barcan Formula with actualism by positing contingently non-concrete objects.[1] However, it has been argued that an actualism based on the existence of contingently non-concrete objects is not genuinely actualist, because contingently non-concrete objects are nothing but proxies, or a different label for possible objects.[2] I will argue for another possible approach—truthmakers as alternative sources of explanation— to argue that Linsky and Zalta's account is an actualist theory.

In the first chapter, I will explain how Linsky and Zalta reconcile the Barcan Formula with actualism, and I will analyze Bennett's, Menzel's, and Williamson's objections to Linsky and Zalta's account. Then, I will suggest another way to evaluate actualism and Linsky and Zalta's theory based on the truthmakers as alternative sources of explanations which is able to satisfy metametaphysical assumptions of both sides. In the second chapter, I will investigate various truthmaker theories, and I will argue that Schaffer's truthmaker monism fits the best for our particular purposes. In the third chapter, I will integrate Schaffer's theory with Zalta's Object Theory in order to have a logical account that can satisfy both Williamson and Linsky and Zalta's, and Bennett and Menzel's metametaphysical assumptions. In the last chapter, I will argue that the way we constructed the truthmakers in

[1] Linsky and Zalta (1994).
[2] Bennett (2006), Menzel (2017).

the Object Theory is parallel to other actualist reductions of possible worlds, and some of the naturalist accounts. Therefore, Linsky and Zalta's theory combined with a semantics that includes abstract worlds as truthmakers can be defended as an actualist theory.

1 In Defense of the S5 Quantified Modal Logic

In this chapter, I will adapt Linsky and Zalta's constant domain semantics for the Simplest Quantified Modal Logic to S5 quantified modal logic, and discuss the arguments that question whether Linsky and Zalta account is an actualist one. Firstly, I will present the classical understanding of actualist and possibilist theories. Secondly, I will briefly present the S5 quantified modal logic (S5QML), and its semantics that is adapted from Linsky and Zalta's constant domain semantics. Then, I will explain the reasons why actualists think that the metaphysical interpretation of S5QML is problematic, and explain how Linsky and Zalta's account can reconcile the Barcan Formula and actualism. Lastly, I will consider the objections against Linsky and Zalta's approach by Karen Bennett, Chris Menzel, and delineate Timothy Williamson's reasons for abandoning the actualism and possibilism debate. Then, I will analyze what Bennett's and Menzel's arguments have in common, and I will try to show a possible way to approach to the debate between actualism and possibilism.

1.1 Classical Understanding of Actualist and Possibilist Theories

Before getting into the problem of actualism within S5 quantified modal logic, and Linsky and Zalta's metaphysical theory, I would like to introduce the general distinction between actualism and possibilism. Actualism is generally

defined as "Everything there is, is actual".[3] But, what does this definition of actualism tell us? There are two underlying intuitions about this definition that actualists share. The first intuition is about the existential quantifiers. Take (1) existential quantifier to be loaded, i.e., whatever is in the range of the existential quantifier exists. In other words, there is not any difference between "is" and "exists". (2) There do not exist any possible objects. So, actualists do not want to commit to the existence of possible objects such as "Wittgenstein's possible second son" or possible "alien" objects.[4]

The combination of both of these intuitions rules out certain possible moves. Firstly, actualists do not want to use a special existence predicate for the objects that exist, or define another particular quantifier for the objects that *are* as in some versions of free logic, because the first intuition assumes that there is one type of unrestricted existential quantifier and whatever is bound by that quantifier exists.[5] Secondly, actualists do not want possible objects to be quantified over when they take the existential quantifiers as loaded. In other words, objects that are bound by the existential quantifier should only exist in actuality.

Rejection of one of these intuitions gives us possibilist theories. One can be a Meinongian possibilist by denying the first intuition.[6] In this interpre-

[3]Linsky and Zalta (1994). Similar formulations can be found in Plantinga (1976), Adams (1974): "There neither are nor could be any nonexistent objects".

[4]Alien objects are the objects that do not exist in the domain of the actual world, but they exist in the domain of another possible world, Lewis (1986, p. 1, 2).

[5]An example of a formal semantics with two different existential quantifier can be found in Routley (1966). Another example with the existence predicate can be found in Lambert (2003).

[6]For Meinong's original theory see Meinong (1960), for a semantics for Meinongian

tation, so-called possible objects *are*, but they do not exist. For example, the variable in the sentence "There is something such that possibly it is Wittgenstein's second son" is bound by an existential quantifier and it ranges over objects that are possibly Wittgenstein's second son. However, since the existential quantifier does not have to be loaded, we can interpret it as if the object that is possibly Wittgenstein's second son does not exist, but it only *is*. So, Meinongian possibilists are not committed to the existence of possible objects, but they attribute a different ontological status to the possible objects by either not restricting the existential quantifier to the existing objects or by defining an existence predicate. On the other hand, one can be a Lewisian possibilist by only denying the second intuition.[7] In this case, existential quantifiers still commit them to the existence of objects, but they can range over possible objects, and possible worlds are conceived to be the mereological sums of these possible objects. Thus, the taxonomy of possibilist theories can be constructed by denying one of the actualist intuitions.

1.2 S5 Quantified Modal Logic and the Problem of Actualism

In this section, I will briefly show the difference between the simplest quantified modal logic (SQML) and the S5 quantified modal logic(S5QML), and I

theory see Parsons (1980).

[7]Lewis (1986).

will introduce the constant domain semantics for the S5QML. [8] Then, I will explain the reasons why actualists think that the S5QML is problematic.

The axiomatic difference between the S5QML and SQML is that in S5QML we add the K and S5 axiom, and the necessitation rule to the first-order predicate logic axioms, and in SQML we add the Barcan Formula as an axiom along with the K axiom, necessitation rule, and the axioms of first-order logic. So, S5QML is stronger than the SQML. Moreover, the Barcan Formula can be proved in S5QML:[9]

Barcan Formula (BF): $\Diamond\exists x Fx \rightarrow \exists x \Diamond Fx$

The semantics for S5QML that I will introduce is adapted from Linsky and Zalta's semantics for SQML.[10] Since their argument for the compatibility of actualism and Barcan Formula is based on their semantics, in particular the constant domain of objects, I will construct the semantics for S5QML similar to theirs. The only difference is that we do not need the accessibility relation in S5QML. The model $\mathbf{M}$ for S5QML is a quadruple $< W, w_\alpha, D, V >$. It consists of the set of possible worlds W, a unique element of W, w_α(the actual world), one domain of objects D, and a valuation function V that assigns each constant to a member of D and assigns each n-place predicate to a function from possible worlds to sets of n-tuples drawn from D.[11] We

[8] The language and axioms for SQML and S5QML can be found in the Appendix section 5.1. and 5.2.

[9] The axiomatic proof of the Barcan Formula can be found in the supplementary document Menzel (2017).

[10] Linsky and Zalta (1994, p. 433, 434).

[11] Linsky and Zalta (1994, p. 433).

also have an assignment function $\mathbf{f}$ that assigns variables to the members of D. We represent terms as τ in the metalanguage. If τ is a constant a, then we define its denotation with respect to model $\mathbf{M}$ and assignment $\mathbf{f}$ ($\mathbf{d}_{\mathbf{M},\mathbf{f}(a)}$) is $V(a)$. If τ is a variable x, then its denotation with respect to the model $\mathbf{M}$ and assignment function $\mathbf{f}$ (($\mathbf{d}_{\mathbf{M},\mathbf{f}(x)}$)) is $\mathbf{f}(x)$.[12]

The metaphysical interpretation of the semantics of S5QML is taken to be problematic by actualists because of three valid formulas of the system—the Barcan Formula, the Converse Barcan Formula and Necessary Existence—, and the ontology of possible worlds. I will only describe the problem with the Barcan Formula, because the way Linsky and Zalta solve the problems with BF is at the center of the debate between actualism and possibilism. BF asserts that "If it is possible that there is an object that instantiates F, then there is an object that is possibly F". For example, "If it is possible that Wittgenstein has a second son, then there is an object that is possibly Wittgenstein's second son" gives us that if we assume that possibly Wittgenstein can have two sons, then there is an object in the actual world that is possibly Wittgenstein's second son. So, in order for the BF to be true, there should be objects in actuality that are possible in a certain way. As can be seen, BF can be considered to be problematic for actualists because one can interpret the ontological commitment to some of the objects that are possibly so and so, the "alien" objects, as commitment to the possible objects,

[12]Definitions of satisfaction and truth at a world can be found in the Appendix section 5.3.

which is against the second intuition. Another problem with the modal semantics for actualists is the existence of possible worlds. Since the set W of possible worlds is part of Model $\mathbf{M}$, and they play a semantic role in account of truth in language; one might interpret W's existence as committing to the existence of possible objects. However, there are actualist reductions of possible worlds to actuality.[13] I will skip the discussion on the existence of possible worlds for now, because in Chapter 3 and 4, these theories will be investigated in detail.

How can we reconcile the Barcan Formula with actualism? Some actualist philosophers develop modal semantics in which the BF cannot be provable to bypass the problem with the Barcan Formula,[14] but there are also other actualists who try to reconcile BF with the actualist thesis such as Ruth Barcan Marcus.[15] Ruth Barcan Marcus defends the validity of BF in an actualist framework by modifying the domains of possible worlds to be coextensive to the domain of actual world or to be the subset of the domain of the actual world.[16] She starts by arguing that definite descriptions are either not adequate to provide identity conditions for objects or they recycle the names in order to provide identity conditions.[17] So, we can only refer to the objects by names. Then she argues that since an object must exist in order to be

[13]For abstractionist accounts see McMichael (1983), Adams (1974), Plantinga (1976), Fine (1977), Zalta (1983). For a combinatorial account see Armstrong (2004).
[14]For such theories see Kripke (1963), Prior (1957).
[15]Marcus (1986).
[16]Marcus (1986, p. 212).
[17]Marcus (1986, p. 202, 203).

named, we cannot talk about direct reference to possible objects.[18] Consequently, when we talk about an object by name that can be in a certain way, we talk about an actual object that can possibly be in a different way. In other words, if it is possible that Socrates is foolish, then there is an actual object that can possibly be foolish. Since we can only talk about actual objects, we can only have instances of the Barcan Formula with actual objects, which does not make it problematic for actualists. However, there are two different problems with this account. First, restraining all possible domains of individuals to the domain of actual world implies that there cannot be an object distinct from the actual objects, but when we talk about possibilities we generally want to include "alien" objects that can possibly populate the world even though they do not populate the actual world. Second, actualists share certain intuitions on the essences of objects such as origin essentialism.[19] If we assume that actual objects have certain essences based on their origins, then there cannot be any object in the actuality that can possibly be another object, since it would possibly have another origin.[20] In other words, we cannot argue that "It is possible that Wittgenstein's second son exists, because there is an object that is possibly Wittgenstein's second son" is true by referring to an actual object that can possibly be Wittgenstein's second son, since it essentially has a certain origin.

On the other hand, Linsky and Zalta think that once a distinction between

[18]Marcus (1986, 211).
[19]Kripke (1972).
[20]Linsky and Zalta (1994, p. 437).

the categories of objects is made properly, one can have a satisfying actualist interpretation of the Barcan Formula. Similarly to Barcan Marcus, they start by denying that BF or any kind of *de re* modal claim forces us to ontologically commit to possibilia.[21] In other words, the existential quantifiers in the *de re* modal claims are not quantifying over objects that are possible, but they ontologically commit us to the objects that *could have been* in a certain way. So, the object that is quantified over is not in fact "Wittgenstein's possible second son" but could be or is *possibly* "Wittgenstein's second son". But, what sort of objects can have the properties of being possibly a certain way? Actualists' essentialist intuitions on the concreteness and abstractness of objects tell us that they can be neither concrete objects nor abstract objects.[22] Actualists think that concrete objects are essentially concrete, and consequently if they exist they must be concrete. Since we cannot find those possible objects around us, they do not exist, so they cannot possibly be concrete objects. They also cannot be abstract objects, since an abstract object is essentially abstract, and anything that is essentially abstract cannot be concrete in another possible world. For instance, a number or a set cannot be concrete because they are essentially abstract. However, we want them to be concrete in some possible world, so, they cannot be abstract.

Linsky and Zalta solve this problem (1) by defining a new ontological category which they call *contingently non-concrete objects*, and (2) by giving

[21] Linsky and Zalta (1994, p. 445).
[22] Linsky and Zalta (1994, p. 446).

a different modalist account of essence. Firstly, the category of contingently non-concrete objects is based on the distinction between ordinary objects and abstract objects.[23] They divide all objects in the constant domain into two different categories. Ordinary objects consist of contingently concrete objects and contingently non-concrete objects. Abstract objects are necessarily abstract, i.e., they are necessarily non-concrete.

$A!x =_{df} \Box\neg C!x$

$O!x =_{df} (\Diamond C!x \wedge \Diamond\neg C!x)$

$\forall x(O!x \vee A!x)$

This categorization of objects in the domain implies that when an object is bound by an existential quantifier, the quantifier does not only quantify over objects with the property of being concrete, it also quantifies over abstract and non-concrete objects. This shows that their theory does not reduce existence to concreteness. Abstract objects and contingently non-concrete objects exist as much as the concrete objects. Concrete objects are the ones that populate the world, but, existence does not only apply to them, it also applies to the contingently non-concrete objects and abstract objects. Therefore, while they take existence as a second-order property, they take abstractness and concreteness as first order properties, which makes room for objects that exist, but does not physically populate the world; unlike the view that associates concreteness with the second-order property existence. In other words, being an object in the domain, whether it is concrete or

[23]Linsky and Zalta (1994, p. 446).

abstract, is sufficient for an object to exist in Linsky and Zalta's theory.

Secondly, the modalist view of essence holds that essence can be reduced to modal notions. In other words, modalist views take modalities as prior to essences, i.e. they reduce essence to necessity. An object a is essentially F, just in case necessarily if a exists, then it instantiates the property F. Linsky and Zalta change the condition for essential properties while preserving the modalist intuition of essence.[24] They give two different conditions for essential properties for ordinary and for abstract objects. For an ordinary object a "a is essentially F iff necessarily, if a is concrete, then a has F." This shows that ordinary objects are essentially concrete, but it does not mean that they cannot exist without being concrete, since essence is not defined with existence. So, an ordinary object is essentially concrete, but it is not necessarily concrete. On the other hand, an abstract object a is essentially F, just in case necessarily a has F.[25] So, for abstract objects the properties they instantiate in every possible world are their essential properties, and they are essentially and necessarily abstract.[26]

So, how do these changes solve the problem? Firstly, this account solves the problem with the essentialist intuitions of actualists. Actualist intuitions tell us that the objects that are possibly in a certain way are essentially concrete, but they do not populate the actual world. In the constant domain semantics, we have objects that are essentially concrete, but possibly non-

[24]Linsky and Zalta (1994, p. 447).
[25]Essential properties of abstract objects will be discussed in detail in Chapter 3.
[26]For further discussion on this modalist view of essence see Zalta (2006).

concrete which makes room for the objects that can possibly be in a certain way. For example, the object that is possibly Wittgenstein's second son is an existing object that is essentially concrete, but not abstract and is possibly non-concrete, so it does not populate the world. So, by changing the traditional modalist understanding of essence we can make sense of the essentialist intuitions of actualists while being committed to non-concrete objects. This also holds for origin essentialism, or any kind of essence attributed to an object, since the essences are determined when they are concrete, the objects that are possibly F can exist without instantiating their essential properties.

Secondly, this account shares both of the intuitions of actualism. Regarding the first intuition, whatever is bound by the existential quantifier exists. In the sentence "There is an object that is possibly Wittgenstein's second son", the contingently non-concrete object—the object that is possibly Wittgenstein's second son—exists. But, this does not make it a possible object or a non-existent object, because it is an actual object in the domain, and it exists. Regarding the second intuition, we do not commit to the existence of possible objects, we commit to the existence of actual objects that are possibly in a certain way. In other words, the referent of "Wittgenstein's possible second son" is not a possible object, but an actual non-concrete object that possibly has the property of being Wittgenstein's second son. Therefore, Linsky and Zalta's account can reconcile Barcan Formula, and S5QML, with actualism.

This interpretation also makes BF accord with common sense by provid-

ing room for the objects that can be distinct from the objects that we see, as opposed to Marcus' account. Since concrete objects are the ones that populate the world, and different objects can be concrete in other possible worlds, this theory makes room for the alien objects that can be encountered in other worlds. However, this is due to the fact that we distinguish existence from concreteness. The alien objects exist but they are not concrete, so we do not interact with them, but we could possibly interact with them. Lastly, contingently non-concrete objects are more similar to concrete objects than to abstract objects, because both concrete and contingently non-concrete objects are essentially concrete whereas abstract objects are essentially abstract. This shows that the objects that could have been in a certain way are not abstract objects, they are more similar to concrete objects.

1.3 Objections to Linsky and Zalta's Theory

However, whether contingently non-concrete objects are genuine actual objects is subject to debate among some philosophers. There are three different criticisms to Linsky and Zalta's theory that I want to discuss. Firstly, Karen Bennett argues that contingently non-concrete objects are *proxies* that substitute for possible objects, hence they do not actually exist in the classical sense. She starts by explaining the structural similarities between Plantinga's, and Linsky and Zalta's accounts.[27] She thinks that the fixed domain of necessary existent things contain *proxies* for possible things in

[27]Bennett (2006, p. 271, 272).

both of the accounts. For Linsky and Zalta account, these proxies are the contingently non-concrete objects and for Plantinga's account they are the individual essences. She defines the *display case* as the objects that exist in the classical sense.[28] In her terminology, Linsky and Zalta's concrete objects are "in the display case". In Plantinga's account exemplified individual essences are the objects that are in the display case. She takes the set of objects in the display case to be a proper subset of all objects that Plantinga, and Linsky and Zalta claim to exist. However, she also thinks that there are three crucial differences between these accounts[29]. (1) They differ in terms of their ontological commitments. Linsky and Zalta are ontologically committed to their contingently non-concrete objects rather than individual essences. (2) They differ in terms of the domains. Linsky and Zalta's account has a fixed domain which contain both abstract and ordinary objects whereas Plantinga uses varying domains for the objects that exist in different worlds. (3) They differ in terms of the relation between proxies and the display cases. In Linsky and Zalta's account the so-called proxies fail to exemplify the concreteness property required to be in the display case, so the same object becomes concrete in another possible world, and the relation between the proxies and the objects in the display case is identity. For Plantinga, when an individual essence is being exemplified, a new object comes into the domain. So, the relation between proxies and the

[28]Bennett (2006, p. 268).
[29]Bennett (2006, p. 268–270).

objects in the display case is a non-identity relation. However, she thinks that regardless of these differences, they similarly use proxies to account for possible objects. Hence, both of the theories use a similar way to bypass the problem with actualism and the Barcan Formula.

As a consequence of her interpretation of these two accounts, she thinks that actualism does not apply to either of the positions. She names this position *proxy actualism* to differentiate it from possiblism and actualism. According to her, the divison between possibilism and actualism is based on the ontological commitment to possible objects. She says that actualism can be characterized as "everything that exists is actual and the other way around". She says that if one denies that "everything that exists is actual" he is a possibilist.[30] Neither Linsky and Zalta nor Plantinga think they deny it, because in their system every object in the domain of objects—the constant domain for Linsky and Zalta, variable domains for Plantinga— is actual. So, for them everything that exists is actual, hence, they are not possibilists. But, she thinks that they deny the other direction when one takes existence in the classical sense, i.e. when one takes existence as concreteness. So, the existence of proxies is not enough for her to call either of these accounts actualist in the classical sense, since she takes being actual as concreteness, and denies Linsky and Zalta's conception of being actual as being an object in the domain. Therefore, she thinks that proxy actualism does not fall under any of these categories, and hence, it is neither an actualist nor a possibilist

[30]Bennett (2006, p. 282).

theory.

As with Bennett's objection, Menzel argues that even though in form Linsky and Zalta's account seems to be an actualist one, its metaphysical content is still possibilist.[31] He says that Linsky and Zalta's account uses all the benefits of SQML while not ontologically committing to possibilia, but he thinks that the contingently non-concrete objects are "nothing but the possibilist's mere possibilia" which makes Linsky and Zalta account "nothing more than thinly veiled possibilism".[32] He thinks that Linsky and Zalta's actualism only changes the terminology for possibilia, but does not change the metaphysical content of the objects. So, according to Menzel, a classical actualist might deny Linsky and Zalta's actualism on the basis that it violates the spirit of actualism, since there is still a category that consists of objects that do not exist in the classical sense, and their metaphysical content is not highly different from "being" in the Meinongian sense[33] or "exist as a possible object". Menzel calls this type of approach *new actualism* as opposed to the serious actualist theories in which this type of replacement cannot be found.

Lastly, Williamson argues against the debate between actualism and possibilism, and tries to switch the debate to one between necessitism and contingentism. He thinks that there is no satisfying answer to the question that investigates whether an object is actual or possible.[34] He thinks that there

[31] Menzel (2017).
[32] Menzel (2017).
[33] "Sosein" in German.
[34] Williamson (2013, p. 22).

are two possible conditions that the distinction could be based on: an ontology of possible worlds, or making the distinction solely based on semantics. He considers the explanations based on the nature of the world as pseudo-explanations, because he thinks that the nature of the actual world is more obscure than the actuality of objects.[35] For example, the explanation "an object a is actual because it exists in the actual world" is not an adequate explanation for him, because the nature of the actual world and other worlds is obscure and reference to them is just a digression. He says this answer requires a presupposition about what possible worlds are, and the presupposition makes the explanation dependent on one's accepted metaphysical theories. For example, Lewis' modal realism asserts that there are various spatio-temporal systems and the one we dwell in is the actual one.[36] So, according to modal realism, to be actual is to be in the spatio-temporal system that we are in, and to be a possible object is to be in other systems. However, one can say that other spatio-temporal systems can be considered as part of actuality as well and this makes the distinction between possibilism and actualism collapse. So, he refuses to talk about the ontology of worlds, because it gets us into further metaphysical debates. Secondly, he thinks that if we base the discussion of actuality solely on the modal semantics, actualism becomes trivially true.[37] Assuming that we accept the premises, (1) if an object a exists, then a actually exists, (2) being in the domain

[35]Williamson (2013, p. 22).
[36]Lewis (1986, p. 92, 93).
[37]Williamson (2013, p. 23).

suffices for an object to exist, and we apply them to objects with modal properties, it makes actualism trivially true, because the objects that could have been in a different way are going to be actual without doing anything harder than just being in the domain.[38] In other words, any object in the domain—regardless of its properties— would be considered as actual without having any other metaphysical qualification for being actual. So, he believes that when the distinction between actualism and possibilism is only based on modal semantics, it makes actualism trivially true, and does not provide any metaphysical justification for actual objects. Therefore, he says it is better to start up with new terminology—contingentism and necessitism—[39] instead of trying to clarify the distinction between actualism and possiblism, because this distinction between contingentism and necessitism does not assume anything further than the modal semantics.

Bennett and Menzel's criticisms seem to be directed at Linsky and Zalta's differentiation of concreteness from existence. They seem to find it counterintuitive to take objects that are not concrete as actual objects, i.e., just to be a part of the domain is not enough for objects to be taken as actual objects. Here we can see the central point of the debate, the ontological interpretation of the constant domain semantics is not adequate for philosophers to accept Linsky and Zalta's theory as an actualist theory. Because they think that

[38] Williamson (2013, p. 23).

[39] According to Williamson, necessitism says that "Necessarily everything is necessarily something", and contingentism denies that everything is necessarily something.Williamson (2013, p. 2).

being an actual object is more than being an object in the domain, there should also be other metaphysical justifications for them to be considered as actual objects. Consequently, their idea of an actual object is based on certain metaphysical premises. For example, one can take actual objects as the objects that we see in the world and this would give them a further metaphysical justification to count them as actual. According to this definition of actual objects, contingently non-concrete objects cannot be thought as genuine actual objects since they are not the objects that we encounter in the world. On the other hand, Linsky and Zalta are satisfied with taking semantics as the determinant of the metaphysical theory. In this division, Williamson seems to be closer to the Linsky and Zalta's side that suggests semantics is what determines one's metaphysics, even though, he disagrees with this distinction because (1) he finds that being actual is trivial and (2) he does not want to talk about he nature of possible worlds when we talk about actuality. It seems like here we encounter a dead end in the debate, since both sides argue for their positions based on different metametaphysical grounds. One side taking semantics as the guide to metaphysics, and the other side holds that in order to make a metaphysical distinction between objects, we need a more metaphysical basis. Therefore, the semantical interpretation of the contingently non-concrete objects tells us that they are actual objects, and the metaphysically loaded interpretation of them tells us that they are not actually actual objects, and the center of the debate is the metametaphysical disagreement between the sides.

We can also look at this problem from the perspective of explanation. As mentioned above, the problem is based on the ontological interpretation of *de re* modal claims. We explain the truth of the sentence "There is something possibly alien" in the constant domain semantics of S5QML by using the existence of contingently non-concrete objects, i.e., the sentence is true because there is a contingently non-concrete object that has the property of being possibly alien. We can say that the objectors do not accept this explanation as an actualist explanation of the truth of the *de re* modal claim, because the explanation does not depend on a concrete object, and as argued above arguing for actualism on the basis of contingently non-concrete objects would not take us anywhere. So, we need to investigate other sources of explanation for the truth of *de re* modal claims. I will suggest looking at the *truthmakers* of *de re* modal claims, since the main dispute centralizes on the explanation of the truth of the *de re* modal claims, and truthmakers can provide a metaphysical component to the explanations. By investigating the truthmakers of *de re* modal sentences, (1) we can add additional metaphysical conditions for the distinction between actualism and possibilism, since it can reveal other entities that explain the truth of *de re* modal claims. (2) We can see how these truthmakers can be integrated in the semantics of S5QML, which will give us our correct metaphysical picture. Therefore, finding the right truthmakers for the *de re* modal claims, and integrating them in our semantics would combine the metametaphysical intuitions of both sides of the debate. It will take semantics as the determinant of the metaphysics,

and would add another metaphysical condition for the distinction between actualism and possibilism.

2 Worlds as Truthmakers

In this chapter, I will try to find a plausible truthmaker theory by trying to find a theory that can avoid most of the problems about truthmakers in the literature, and provide a good explanatory structure for truths. I will start by arguing that propositions should be the truthbearers, and we should find a truthmaker theory that can account for all kinds of propositions, including negative existentials, general propositions, and logically necessary propositions. Then, I will move on to the nature of the relation between the truthmaker and the truthbearer that can give us a good explanatory structure. Given the results about the relation and truthbearers, I will evaluate different truthmaker theories to find the one that can fit the results. Lastly, I will argue that Schaffer's theory of truthmaking—which takes worlds as truthmakers and the grounding relation as the truthmaking relation— is a good candidate that can avoid the problems with truthmakers and provide an alternative explanation.

2.1 Problems with Truthmakers

The general formulation of the notion of truthmaking is "a truthmaker is that in virtue of which something is true"[40] This formulation generates three different questions that are discussed broadly in the truthmaking literature. The first question is about the metaphysics of truthmakers. What kind of en-

[40]MacBride (2016).

tity is a truthmaker? Is it an object, a property, a fact? The second question is about truth itself. What is the "something" that is true? Is it a sentence or a proposition? Regarding the second question one can also ask about what truth is. Is it a predicate or a property that applies to the truthbearer? The third question concerns the relation between the truthmaker and the truthbearer, i.e. the nature of the truthmaking relation. What does the "in virtue of" relation refer to? What are the logical properties it possesses? In this section, I will investigate these questions to find a plausible truthmaker theory.

Let us start with the question about truthbearers. What kind of entities could we say that truth is attached to? I will take truthbearers to be propositions, where the other candidate would be the linguistic entities such as sentences, for the reasons pointed out by John Bigelow.[41] The main reason is that taking truthbearers as linguistic entities presupposes that truth is dependent on the existence of languages, and consequently the existence of humans (or other language using beings), since for a sentence to exist there must be a language. So, this would make truth dependent on human existence. On the other hand, if we take propositions as truthbearers, we will not encounter the same problem, since propositions could be considered as mind-independent abstract objects. Hence, taking propositions as truthbearers would make us able to satisfy the common understanding of truths as something independent of human existence.

[41] Bigelow (2009, p. 397).

Before investigating the other questions above in more detail, I will assume that every truth has a truthmaker. In other words, regardless of the logical form of the truthbearer, I will assume that every truth requires a truthmaker. There are two further questions concerning this assumption. First, what are the different forms of truths? There are non-logical molecular truths such as "Snow is white and grass is green", logical molecular truths such as "If all tables are green, then all tables are green", and atomic truths such as "The table is green". Since the truth of the logical molecular truths does not depend on the truth of its constituents, it is a different type of truth than the non-logical molecular truth. For example, the logical truth "If all tables are green, then all tables are green" will require a truthmaker for the whole molecular proposition, because it is true whether its components are true or not. So, its truth does not depend on the truth of its constituents, but depends on the structure of the proposition. The truth condition of the connective plays the main role in determining the truth of the logical truth instead of the constituents. Hence, when we search for a truthmaker for the logical truths we should look for the truthmakers that make the whole proposition true. On the other hand, for non-logical molecular truths I will only look at the truthmakers for atomic propositions, because we can determine the truth of molecular propositions by determining the truth of its constituents using the truth conditions of connectives. For example, the truth or falsity of the proposition "Snow is white and grass is green" is dependent on the truth of the constituents "Snow is white" and "Grass is green".

So, if we find the truthmakers of these propositions, we can derive that the conjunction is also true. Therefore, for the non-logical molecular truths, we need to find the truthmaker of its constituents, whereas for the logical molecular truths we need to find truthmakers for the whole proposition since their truth does not depend on the truth of their constituents but depends on the structure of the proposition.

However, there are also other types of propositions that are problematic for truthmaker theories, such as universal propositions and negative existentials. Firstly, propositions that express universal truths are taken to be problematic, because taking a single entity, such as a general facts, or their lack of truthmakers as the truthmaker analysis causes different problems.[42] For example, is the truthmaker of the propositions "Humans are mortal" a set, the plurality of individuals consisting mortal humans, a fact about two sets , that the set of humans is included in the set of mortals, or is it a single entity that can make it true such as a general fact? The second problem is with negative existentials and absent properties. Can there be truthmakers for propositions such as "Unicorns do not exist" or "This table is not blue"? How can an absence of something be a positive entity to make the proposition true? Since we assumed that all truths have a truthmaker, we cannot say that problematic cases lack truthmakers. Therefore, our truthmaker theory should give an account for these types of propositions as well.

[42]These problems will be analyzed in detail in 2.2.. For the former view see Armstrong (2004, p. 68-83) and Russell (1972, p. 61-77), and for the latter view see Bigelow (1988).

When we come to the "in virtue of" relation, we want it to have certain features. Since our primary aim in searching for truthmakers is to find another source of explanation for *de re* modal truths, the "in virtue of" relation should be aligned with the general features of explanations, and explanations should manifest some sort of connection between the *explanans* and *explanandum*. Firstly, we do not want the relation to be symmetric since we want the truthmakers to give an account of truth and not vice versa. In other words, we want the truthmaker to make the proposition p true, but we do not want the truth of p to make the reality.[43] This also holds for explanations, we want the existence of truthmakers to explain the truth, but we do not want the truth to explain the existence of the truthmaker. We also want the relation to be irreflexive, since a truth that is true in virtue of itself does not give us any kind of explanation of why the proposition is true. Secondly, we want the truthmaker to be somehow related to the proposition, i.e. when we say x is the truthmaker of p we do not want x to be a random entity. So, we want truthmakers to have some sort of connection with the propositions. How can we show this connection? Gonzalo Rodriguez-Pereyra suggests that (1) truthmakers should be the subject matter of the propositions and (2) truthmakers should necessitate the propositions.[44] So, the "in virtue of" relation should cover both (1) and (2).

Firstly, the need for (2) comes from the need for the relation between

[43]Rodriguez-Pereyra (2005, p. 19).
[44]Rodriguez-Pereyra (2005, p. 18, 21).

the truthmaker and the truth to not be a contingent relation. In other words, it prevents truthmakers existing when propositions are false. This is a criterion that shows the non-random connection between the existence of the truthmaker and the truth of the proposition. So, in all possible worlds, when the truthmaker exists, then the proposition is true. However, even though condition (2) gives us a relation that manifests the connection between the truthmaker and the truth, it is not adequate by itself. Consider the following thought experiment from Smith:

"Suppose God wills that John kisses Mary now. God's willing act thereby necessitates the truth of 'John is kissing Mary'. (For Malebranche, all necessitation is of this sort.) But God's act is not a truthmaker for this judgment. Intuitively, truthmaking cannot be done from afar, ..., a truthmaker for a given judgment should fall within that portion of reality to which the judgment corresponds."[45]

We can see in this case that, even though the God's will necessitates the truth of the proposition, its existence is irrelevant with regard to its explanatory role in the truth. So, in order for an object to be the truthmaker of a proposition, it also needs to be a part of reality that determines the truth, not only the object that necessitates it.[46] In this case, the truthmaker

[45]Smith (1999, p. 6).

[46]What "determines" means in this context is explained in the following quotation: "For the root of the idea of truthmakers is the very plausible and compelling idea that the truth of a proposition is a function of, or is determined by, reality. Thus suppose that the proposition that the rose is red, which makes reference to a particular rose, is true. Then the truth of this proposition is a function of reality in the sense that the truth of the proposition is determined by reality or a portion of it. Indeed, it is a relevant portion

should be a part of reality that is related to "John kisses Mary", which is the part of reality that the proposition "John kisses Mary" is about. Armstrong calls these truthmakers "minimal truthmakers" and defines them as these entities such that if we subtract something from the entity it would not be a truthmaker anymore.[47] For example, according to his view, the conjunction of the fact that Canada is in North America and the fact that Japan is in Asia is not the minimal truthmaker of the proposition "Japan is in Asia", since if we drop the fact that Canada is in North America, the remaining fact would still be the truthmaker of the proposition.

In short our truthmaker theory should be able to give an account for both (1)logically true molecular propositions and atomic propositions, and (2a)general propositions and (2b)negative existentials. The truthmaking relation should be an (3)irreflexive and assymmetric relation, and should capture the (4a)necessitation and (4b) aboutness criteria.

2.2 Other Truthmaker Accounts

In this section, I will survey some of the major truthmaker theories, and try to find the theory that solves the issues mentioned above and fits best with our purposes. We encounter several different entities in the literature

of reality, namely the rose, or perhaps that the rose is red, that determines the truth of the proposition...Thus the idea that truth is determined by reality sounds grand, but in itself it is a very minimal idea: it is simply the idea that the truth of a truthbearer is determined by its subject matter, or some feature of it, no matter what the nature of the subject matter may be."Rodriguez-Pereyra (2005, p. 20, 21)

[47]Armstrong (2004, p. 19, 20).

such as objects, universals, essences, facts, situations, worlds and so on for truthmaker theories. Firstly, we cannot have *only* properties and objects, or their mereological sum as the truthmakers of propositions. To begin with, there is the Fox-Bigelow paradox for properties and objects.[48] We do not have something that can show why a is F based on the existence of either a or F, since a's being F is a contingent matter. For example, we can say that the property red and the object this particular table cannot be the truthmakers of the proposition "This table is red", because neither one of them, or their mereological sum necessitates the truth. We can easily think a possible world where both the property redness and the table exists, but they are not connected to each other. So, there must be a connection between the object and the property to make this account to pass criterion (4a).

There are two different possible moves that one can do to make these entities truthmakers. One of them is by stipulating a different entity that shows the connection between the object and the property such as tropes and facts, and the other one is giving additional conditions to the truthmaking relation that is supposed work as the "in virtue of" relation. Facts or states of affairs are possible candidates for an entity that show the connection between properties and particulars. Facts are atomic entities such as <Socrates's having a beard> that have both objects and properties as constituents. It is important to note that facts are not mereological sums of these entities, it is a different form of composition which makes its constituents necessarily

[48]Bigelow (1988, p. 137, 138).

connected with each other, since if the fact exists, it is necessary that both the object and the property exist.[49] So, they do not face the Fox-Bigelow paradox because the connection between the object and the property is not a contingent connection, but a necessary one. However, fact accounts face certain problems regarding different types of propositions such as negative existential propositions and universal propositions. Firstly, if we take facts as the truthmakers how are we going to account for negative existentials, so how are we going to satisfy the criterion (2)? Are there going to be facts that make negative existentials true? Russell calls these facts negative facts and accepts them into his ontology.[50] But, these negative facts bring further questions about their nature. If we take facts as entities that consist of objects and properties, we also should be able to say that facts can exist without one of their constituents. For example, is the proposition "Sherlock Holmes does not exist" made true by a fact that does not have Sherlock Holmes as its constituent? Is the proposition "The table is not green" made true by the fact <the table, not being green>?

These questions can be bypassed by replacing existence with concreteness as Linsky and Zalta do and by adding negative properties to our ontology. One can say that the proposition "The round-square does not exist" actually means "The round-square is not concrete", and its truthmaker is the fact

[49]For example, Armstrong says: "It is widely appreciated that these entities, if they exist, have a non-mereological form of composition (a and F might both exist, yet a not be F). Yet the state of affairs of a's being F seems to include, to have as constituents, the particular a and the property F."Armstrong (2004, p. 18).

[50]Russell (1972, p. 32-46).

<The round-square, not-concreteness>. So, the problem can be solved when it is combined with the Linsky and Zalta account. Furthermore, we also have the problem with universal propositions. There seems to be two options for a fact account to give an account of universal propositions. (i) is biting the bullet and saying that, there is a fact making universal truths. For example, there is a fact <Humans, mortal> that makes the proposition "humans are mortal" true.[51] The option (ii) is making the set of facts about all individual's being in a certain way the truthmaker of the universal propositions. For example, the set of < Socrates, mortal>, < Plato, mortal> and so on is the truthmaker of the proposition "humans are mortal". However, this account needs a further fact that shows the collection of facts are all the facts, because otherwise we cannot show that the collection of the facts are adequate to make the universal proposition true.[52] Hence, accepting facts with non-concrete objects, and either stipulating general facts or higher-order general facts gives us a viable option for truthmakers.

Since the fact account is a plausible truthmaker account for non-modal propositions, we can try to construct a form of it for modal propositions as well. A possible way to do it is by using the Linsky account.[53] We can say that for the proposition "It is possible that the table is brown", we can stipulate a fact that contains a fact that is at a world. In other words, The proposition "It is possible that the table is brown" is true in virtue

[51]Russell (1972, p. 69).
[52]Armstrong (2004, p. 70).
[53]Linsky (1994, p. 13, 14).

of the fact that <<the table, brown>, w, At> in which, w is a world[54], and At is a relation in which w and the fact <the table, brown> are its arguments. We can construct the facts about necessary propositions the same way. "Necessarily, water is H20" in virtue of the fact that $\forall w$ <<water, H20>, w, At>. Lastly, for iterative *de re* modal truths we can also stipulate facts. For example, the proposition "Wittgenstein's second son could have been a priest" can be paraphrased as "Possibly, Wittgenstein has a second son and it is possible that Wittgenstein's second son is a priest".[55] This proposition is true in virtue of the fact that <<<Wittgenstein's second son, concrete>, <<Wittgenstein's second son, priest>, w, At>>, w', At>. In other words, we have a fact that consists of a fact that is possible in a world, and that possible fact is composed of two other facts. One of them asserts Wittgenstein's second son's being concreteness, and the other is a fact that is at another world, and asserts Wittgenstein's second son's priestness. Thus, we can show the truthmaker for iterated modal truths by providing embedded possible facts.

However, there are a couple of problems with this account. Firstly, when we apply this treatment to the truths about contingently non-concrete objects, we will have facts that contain non-concrete objects. Facts having those objects as constituents would only shift the discussion from the so-called "proxy" objects to the so-called "proxy" facts. So, we would not be

[54]Linsky takes worlds as large, maximal facts. So his conception of worlds are different from Lewis' worlds.

[55]Formally: "$\Diamond(Sa \wedge \Diamond Pa)$.

able to settle the debate, instead we would have a similar debate with different entities. Secondly, the form of the facts is ambiguous in the case of iterative *de re* modal facts. It seems like there are two options, either accepting that there are facts that have facts as its constituents as is done above, or having facts contain more than one property. For example, instead of the treatment above, we would have the fact that <<Wittgenstein's second son, concrete, priest>At, w>. The former suffers from a problem concerning the nature of facts. If we accept the treatment above, we have to accept that facts are entities in which objects occur, as well as allowing that facts are entities that can be mereological sums of facts. So, we might end up accepting that there can be facts that contain different types of entities. Moreover, the latter way suffers from the problem of the arbitrariness of the number of constituents of the facts. Do they have two constituents, or three constituents etc.? Therefore, even though the fact account gives us good insights about the way we should solve the Fox-Bigelow puzzle, and the way we should treat modalities concerning truthmakers, it still falls short on certain other aspects.

As mentioned above, another strategy to solve the problems concerning the Fox-Bigelow paradox is to revise the "truthmaking relation". One of the proponents of this account is John Bigelow.[56] Bigelow bypasses this problem by giving a supervenience account of truthmaking "If something is true then it would not be possible for it to be false unless either certain things were to

[56]Bigelow (1988).

exist which don't, or else certain things had not existed which do"[57] Following his theory, if the property red or the object—the table— were not to exist, then the proposition would have been false. So, the truth of the proposition supervenes on the property of being red and the table. Consequently, they have to exist together in order for this proposition to be true. However, his account only asserts that truth supervenes on being, which could be anything that makes the proposition true such as only the object, property, trope or combination of them.

A positive side of this account is that it shows us that we can avoid the problems concerning necessitation between the truthmaker and the truth by positing a dependence relation as a truthmaking relation. In other words, if the truthmaker relation is able to manifest that without the existence of the truthmaker, the proposition would not be true; then the necessitation is implied by the truthmaker relation itself. However, even though this account shows us a way to solve certain problems with truthmaking, it raises certain other problems as well. Firstly, it does not not tell us much about what kinds of objects the truthmakers for propositions are, rather it gives us a general scheme of truthmaking. So, we need to find the entities that can work with this schema in order to have a complete truthmaking theory. Secondly, supervenience as the truthmaking relation does not provide truthmakers for negative existentials (2b), but it says that they lack falsity-makers. Since we assumed truthmaker maximalism, lack of truthmakers for negative

[57]Bigelow (1988, p. 133).

existentials is an undesired feature of this account. Lastly, even with this account, objects alone cannot be the truthmakers we are looking for, because we want something different from the objects in the domain to explain the truth of *de re* modal claims. Relying on the objects as truthmakers would go against our initial intention to find a truthmaker theory, which was to find a source of explanation that is different from the objects themselves. Thus, our truthmaker theory should contain something more than the mere objects and their relation to the truth. Therefore, we should keep the aid of a dependence relation to solve certain problems, when we are looking for a truthmaker relation. However, we should still find a different entity than the objects as truthmakers, and we should have another dependence relation that can give an account of negative existentials.

As I've mentioned above the other option is to ontologically commit to the entities that can manifest the connection between objects and their properties. Tropes might be one of the suggestions for such entities. Jonathan Lowe argues that tropes are the right truthmakers for contingent truths, since they are part of the essence of propositions.[58] He says that formal ontological properties[59] apply to the objects in virtue of their identities, i.e. in virtue of their essences. For example, a mode or a trope essentially depends on an object, because their existence depends on the object. He says that,

[58] Lowe (2009, p. 211).

[59] "Formal ontological properties and relations are not elements of being, to be included among the overall inventory of "what there is"; rather, they contribute to the nature of reality as a whole solely by helping to constitute how reality is."Lowe (2009, p. 202) According to Lowe, truth, existence and identity are formal ontological properties.

truth also should depend on something in virtue of the truthbearer's identity. He takes propositions as the truthbearers, and tropes as their essences, since without the existence of the tropes—and universals and objects— the propositions would not exist. Moreover, he says that logically necessary truths are their own truthmakers, since it is part of the proposition's essence that it is true.[60] On the other hand, he says that some metaphysically necessary truths such as, the classical Kantian example "7+5=12" are dependent on other objects such as numbers. Even though essential dependence seems to capture some of the criteria that we want our truthmaker theory to capture, there are some issues with it. Firstly, at the beginning we mentioned that the truthmaking relation should be irreflexive (3), because of the desired explanatory structure. However, in Lowe's account logically necessary truths are their own truthmakers, which makes the "in virtue of" relation reflexive. On this account, p is necessarily true in virtue of its essence, i.e. being a necessary truth. This relation does not provide us any explanation about why the proposition is true, besides stating that it is necessarily true because it is necessarily true. So, Lowe's essentialist account of truthmakers does not provide us with a good explanatory structure because of its reflexivity. It is important to note that, similar to the the supervenience relation, essential dependence is also a dependence relation that is used to find the truthmakers.

For both of the accounts,—facts accounts and dependence relation accounts—we have seen that the truthmakers for logically necessary propositions cause

[60]Lowe (2009, p. 209).

problems. The problem is that their truth does not depend on the truth of their constituents and seems to be dependent on nothing but themselves. Stephen Read argues a similar case for disjunctive truths as well, which is a counter argument to the disjunction thesis, i.e. if a disjunction is true, then one of the disjuncts is true.[61] He supposes a proposition "if there is a horse race, then either Valentine or Epitaph will win" and supposes that there are circumstances that makes the disjunction true and the race being held. Both of these facts combined will give us the true proposition "either Valentine or Epitaph will win" without making one of the disjuncts true. So, he suggests that we should give up the disjunction thesis. This would suggest that we can talk about truthmakers of molecular propositions without making one of the atomic propositions true. Therefore, we need to find truthmakers not only for logically necessary molecular truths, but also for disjunctions.

For the case of logically necessary truths one can say that they are going to be true in virtue of the existence of anything, since they will be necessitated or entailed by the existence of any kind of truthmaker. However, this would not satisfy the relevance criterion, because existence of a random truthmaker is not relevant to the truth of a logically necessary proposition. What would explain the truth of such propositions? Before answering this question, we might claim that the disjunctions are true in virtue of the way the whole situation is, since the problematic disjunction above would not be true if the race were not to happen. This whole race being the truthmaker of the

[61] Read (2000, p. 74).

disjunction can also be expanded and taken as some sort of totality being the truthmaker of the propositions, since if the totality were not to exist, proposition would not be true, and we cannot break the situation into its atomic parts. Based on this, we might claim that the necessary propositions are true in virtue of the existence of totality of beings as well. Therefore, we can use some totality of entities as truthmakers in order to explain the truth of logically necessary propositions, and certain disjunctions.

One proponent of this kind of truthmaker theory is Jonathan Schaffer. Schaffer argues that worlds are the only grounds for truths.[62] This claim consists of two distinct metaphysical positions. The first position is *truthmaker monism*, which argues that worlds are the only truthmakers.[63] In other words, one does not relate truths to smaller portions of worlds such as facts or situations, but relates them to worlds as wholes. The second is so-called *metaphysical monism* in which the worlds are at the *fundamental* level and truths are dependent on them. Schaffer's metaphysical monism is a result of his assumptions about the grounding relation.

Schaffer says that he makes metaphysically loaded, neo-Aristotelian, assumptions about the grounding relation.[64] Firstly, he asserts that the grounding relation is a dependence relation by which he means a relation between substances and posteriors. The substances are the grounds, they are fundamental, irreducible, independent, and brute. On the other hand, the poste-

[62]Schaffer (2010, p. 310).
[63]Schaffer (2010, p. 307).
[64]Schaffer (2010, p. 320).

riors are derivative, reducible, dependent, and explicable. Secondly, he holds that grounding is an irreflexive and asymmetric relation, which are claimed to be the right properties for a truthmaker relation that captures the dependency relation between the truth and its truthmaker.[65] Moreover, he claims that truth is a posterior and it must be grounded by a substance. He takes worlds be the grounds for propositions. Therefore, a world w makes a proposition p true iff world w grounds p, which reveals that the world is more fundamental than the truths.

It is important to note that Schaffer's grounding relation captures both explanatory and ontological fundamentality. The grounding relation's ability to distinguish the explanatorily and ontologically fundamental from the derivative aligns with the classical understanding of the truthmaker relation, i.e., the "in virtue of" relation.[66] Even though the "in virtue of" relation is thought to be a primitive relation, it functions to separate entities that determine and explain the truth from the truth itself. In other words, when x is true in virtue of the entity y, y both explains and determines the truth of x. In Schaffer's theory, the neo-Aristotelian assumptions of the grounding relation provides both determination and explanation, because it can distinguish the fundamental from the derivative. If x grounds y, both x explains the truth of y and the truth of y is determined by x, because x is more fundamental than y.

[65] Schaffer (2010, p. 320), Rodriguez-Pereyra (2005, p. 21).
[66] Rodriguez-Pereyra (2005, p. 18, 21), Armstrong (1989, p. 89).

Let us look at the other criteria that we set up in the last section in order to see if this account can provide us what we expect from a truthmaker theory. Firstly, as I have mentioned above, grounding is an asymmetric and irreflexive relation, so it satisfies condition (3). Secondly, this theory does not suffer from the problems concerning negative existentials and universal propositions. We can say that the world itself makes the a universal proposition true because it is the only fundamental being that grounds truths. Since there is no other fundamental being, the world should be the truthmaker of the universal proposition. Since we can take the world as the truthmaker of universal propositions, we can also say that negative existentials are grounded in the world as Armstrong suggests.[67] In other words, since the world grounds the universal proposition "such and such are the only objects that exist", we can say that the proposition "such and such does not exist" is grounded by the world as well, since this proposition is derivable from the higher order universal proposition. Therefore, this account also satisfies (2a) and (2b). Thirdly, taking worlds as the only truthmakers would also enable us to give an account of logically necessary truths, i.e. criterion (1). Similar to the metaphysically necessary truths, we can say that logically necessary truths are true in virtue of the existence of every possible world. So, every logical truth is made true by the worlds, i.e. their truth is grounded in the worlds.[68]

[67] Armstrong (2004, p.75, 76).

[68] However, this treatment violates the idea that every truth requires only one truthmaker, since we use a plurality of worlds as the truthmaker for necessary truths. This issue is discussed in more detail on p. 62

The last criterion we need to look at is the aboutness criterion (4b), i.e. being the subject matter. Truthmaker monism's main weakness is with this criterion, because one might not be happy with the idea that the world itself is the truthmaker of an atomic proposition about physical reality such as "Trump is the president of the USA". An opposing theory would assume the Armstrongian idea of *minimal truthmakers*. Schaffer responds to this problem by using the Lewisian understanding of propositions in which propositions are defined as sets of possible worlds. Lewis says:

"What, in general, is a subject-matter? The answer is anything that somehow encodes the distinction between pairs of worlds that are just alike with respect to the subject-matter in question and pairs that are not. A partition of the possible worlds would do, or equivalently an equivalence relation on worlds"[69]

For example, we get the subject matter of the proposition "Trump is the president of the USA" by considering the sets of worlds in which the proposition is true. And, this proposition is true in those worlds because of how those worlds are. So, in the Lewisian account one does not look at the smaller parts of the world, instead one looks at the collection of the worlds itself in order the determine the subject matter of the propositions.[70] So, if we define propositions as collections of worlds, we can see that they are actually about how the worlds are, contrary to the belief that they are

[69]Lewis (2003, p. 25).
[70]Schaffer (2010, p. 316).

about smaller chunks of the worlds. Therefore, if we accept this definition of propositions, we will be able to satisfy criterion (4b).

Lastly, we need to show that we can use this account for our particular purposes. Firstly, worlds as the explanatory source of truths of *de re* modal propositions are different from the objects in question. So, we can use them as an alternative source of explanation. Secondly, we need to show how they can be constructed as the truthmakers of *de re* modal propositions. The proposition "Wittgenstein's second son is possibly a priest" is itself a set of worlds, and by our conception of propositions, those are the worlds that ground the truth of that proposition. So, the proposition p is true because each world in the collection of worlds grounds the proposition p. Therefore, using worlds as our truthmakers can provide an alternative explanation for the debate.

However, the nature of worlds is an important issue to clarify. David Lewis famously argues that there are concrete possible worlds besides our actual world.[71] On the other hand, he argues that there are other actualist accounts, which comes in three different forms.[72] In the next section, I will try to use one of the actualist reductions for the conception of worlds, and I will construct a semantics for S5 modal logic by using the worlds to satisfy the premise that semantics is metaphysics.

[71]Lewis (1986).
[72]Lewis (1986, p. 136–142).

3 The Abstractionist Conception of Worlds and Grounding

In this chapter the grounding relation as a truthmaking relation will be analyzed with an abstractionist conception of possible worlds, because the abstractionist conception of possible worlds is one of the actualist reductions of worlds. I will integrate Jonathan Schaffer's theory of truthmaker monism and his assumptions on the grounding relation with Object Theory, in which possible worlds are defined as abstract objects, as it is presented in various publications by Edward Zalta. I will show that when we take worlds as the truthmakers of propositions and define grounding in Object Theory with Schaffer's assumptions, one of the important logical properties of grounding —asymmetry— will be lost, because according to the more fine-grained criteria for ontological dependence, worlds are ontologically dependent on propositions. Then, I will argue that since asymmetry is one of the most desired logical properties of the truthmaking relation, the ontological dependence assumption about the grounding relation as a truthmaking relation should be dropped.

In the first section, I will explain Schaffer's theory of truthmakers and the abstractionist conception of possible worlds. Then I will present the basics of Object Theory and define propositions, worlds, and grounding within Object Theory. In the second section, I will demonstrate the problem with grounding when it is defined in Object Theory. I will argue that the ontological

dependence assumption should be dropped, if we want to have the grounding relation as a truthmaker relation in Zalta's abstractionist account. Lastly, I will show that we can still have the grounding relation as a truthmaker relation without the ontological dependence assumption because (1) it can still distinguish the semantically fundamental from the semantically derivative which demonstrates that the grounding relation manifests the explanation relation between the truthmaker and the truth, and (2) the semantically fundamental necessitates the semantically derivative.

3.1 Grounding and Abstractionism

At the end of last chapter, we asked a question about the nature of possible worlds. On the nature of worlds, Schaffer states that even though he is committed to the existence of possible worlds, he is neutral between modal realism and any actualist reductions of possible worlds.[73] Yet, he says that he favors actualist reductions for providing an ontologically economical metaphysics.[74] One of the possible actualist reductions that one can consider is the abstractionist conception of possible worlds.[75] This actualist conception of worlds, as opposed to a possibilist conception, is based on two general premises: (1) possible worlds can be reduced to modalities and (2) the actual world is a distinguished world. Premise (1) would make us able to talk about worlds without having to explain modal truths extensionally. In other

[73]Schaffer (2010, p. 308).
[74]Schaffer (2010, p. 313).
[75]Lewis (1986, 136–142).

words, it makes us able to construct worlds as intensional entities as opposed to extensional ones. Moreover, premise (2) ensures that the actual world will have a distinctive ontological property, so that the theory does not have to accept the Lewisian indexical analysis.[76]

For example, Adams defines worlds as world-stories that are maximal sets of propositions in which *possibly* all propositions are true at the same time.[77] The actual world is a distinguished world, because all of the propositions that are the members of the actual world-story are true. Moreover, Fine takes modal idioms as primitives and defines possible worlds as maximal world-propositions that necessarily imply for every proposition p either p or $\neg p$.[78] Another example of an abstractionist conception of possible worlds can be derived from the principal axioms of Edward Zalta's Object Theory as presented in *Abstract Objects*.[79] He defines propositions as 0-place relations that are encoded by worlds, where both propositions and worlds are defined as abstract objects. His theory captures the general premises of abstractionism. Firstly, it takes modality primitively and defines possible worlds in terms of propositions. Thus, possible worlds are reduced to modal idioms. Secondly, the actual world can be distinguished from other possible worlds within his system. Moreover, Adams', Fine's and Zalta's accounts are also similar in structure. Adams defines worlds as sets of propositions, Fine defines worlds

[76]Lewis argues that if one does not treat the actuality as he does, the indexical analysis, he will be stuck with stipulating the actuality primitively to a world.Lewis (1986, p. 139).
[77]Adams (1974, p. 225).
[78]Fine (1977, p. 119, 120).
[79]Zalta (1983, p. 78–84).

as conjunctions of propositions which could be seen as a proxy for set of propositions, and Zalta defines worlds as abstract objects that encode the members of the set of propositions. Hence, defining the grounding relation in Zalta's axiomatization can show us how the grounding relation would behave in an abstractionist, and consequently actualist, semantics.

I will introduce the technical background for Zalta's Object Theory in order to define the grounding relation and worlds in section 3.2 In section 3.3, I will incorporate Schaffer's grounding relation into Zalta's abstractionist theory.

3.2 Zalta's Theory of Abstract Objects[80]

The language of Zalta's Object Theory is a second-order modal language with two different kinds of variables: $x, y, z, \ldots$ and $F^n, G^n, H^n, \ldots$. The variables range over two different fixed domains: $x, y, z, \ldots$ range over the domain of objects, and $F^n, G^n, H^n, \ldots$ range over the domain of n-place relations. In addition, we use "$\Box$" as a universal quantifier ranging over the domain of possible worlds. It is important to note that even though we understand worlds as primitive objects in our semantics, we do not take them as primitive objects in our metaphysics. We also do not need an accessibility relation in our semantics, since we will be using S5. Moreover, this language

[80]This section is a brief exposition of Zalta's axiomatization and semantics in *Abstract Objects* Zalta (1983, p. 59–76) and "Twenty-Five Basic Theorems in Situation and World Theory" Zalta (1993, p. 402–407). Readers who are familiar with his axiomatization or who are not interested in the technical background of his theory can skip this section.

has two different forms of predication, namely, encoding and exemplifying. Encoding is a type of predication that is peculiar to abstract objects, i.e., only abstract objects encode properties. When an abstract object a encodes the property F, it is represented as "aF" in the formal language. Each n-place relation in encoding formulas has a fixed encoding extension.[81] An encoding formula "xF" is true at a world w iff the objects denoted by the variable x are in the encoding extension of F. Both abstract and ordinary objects can exemplify properties. If an object a exemplifies the property F, it is represented as "Fa". Each n-place relation in exemplification formulas has an exemplification extension at each world that can vary from world to world. An exemplification formula "Fx" is true at a world w iff the objects denoted by the variable x are in the exemplification extension of F at w.

The axioms of the language are composed of the axioms of S5 Quantified Modal Logic and both first and second-order forms of the Barcan Formula. There is another logical axiom about encoding. If it is possible that an object x encodes a predicate F, then it is necessary that x encodes F.

Logical Axiom: $\Diamond xF \rightarrow \Box xF$

A consequence of this axiom is that all true encoding propositions are both possible and necessary truths by axioms of S5 Quantified Modal Logic.

Lemma: $(xF \leftrightarrow \Diamond xF)\&(\Diamond xF \leftrightarrow \Box xF)\&(xF \leftrightarrow \Box xF)$

The main difference between abstract objects ($A!x$) and ordinary objects ($O!x$) is how predicates apply to them. Ordinary objects never encode, but

[81] The encoding extension does not change from world to world.

abstract objects can both exemplify and encode. Hence, we can define ordinary objects as those objects which are not abstract.

Proper Axiom: $\forall x(O!x \rightarrow \Box\neg\exists F(xF))$

$A!$-Objects: $A!x =_{df} \neg O!x$

One of the most important principles of Object Theory is that encoded properties identify abstract objects.[82] That is, two abstract objects are identical just in case they encode the same properties. The identity condition for abstract objects is the following:

ID-$A!$: $x =_{A!} y =_{df} [A!x\&A!y\&\Box\forall F(xF \leftrightarrow yF)]$

The comprehension axiom for abstract objects asserts that there is an abstract object that encodes any property that satisfies any expressible condition in the language. In other words, for any set of properties there is an object that encodes all and only those properties.

Comprehension-$A!$: $\exists x[A!x\&\forall F(xF \leftrightarrow \phi)]$, where ϕ has no free xs.

The following axioms are about the expressible properties in our language. Expressible properties play an important role in the construction of the Object Theory since they are the main components of abstract objects. λ-equivalence states that every expressible condition ϕ in the language has a λ-equivalent. For instance, "x loves y" has the λ-equivalent "being such that x loves y". We also have the Relations axiom, a comprehension schema for relations, which states that every exemplification condition ϕ in the language corresponds to a relation.

[82] Zalta (1993, p. 404).

λ-equivalence: $\forall x_1 \ldots \forall x_n([\lambda y_1 \ldots y_n \phi]x_1, \ldots, x_n \leftrightarrow \phi^{x_1,\ldots,x_n}_{y_1,\ldots,y_n})$

Relations: $\exists F^n \Box \forall x_1 \ldots \forall x_n(F^n x_1 \ldots x_n \leftrightarrow \phi)$, where ϕ has no free Fs, no encoding subformulas, and no quantifiers binding relation variables.

In short, abstract objects are constructed out of the combination of any expressible properties in the language. These properties can be constructed out of relations by using the Relations theorem and λ-equivalence axiom. For example, "being such that x loves y" can be considered as a property. Moreover, according to the Lemma, abstract objects both possibly and necessarily encode these properties. Since abstract objects exist whenever the properties exist, and abstract objects encode them necessarily, the properties encoded by abstract objects can be called their *essential* properties in a modalist account of essences.[83]

3.3 Worlds, Propositions, and Grounding

Now, we have seen the basics of Zalta's Object Theory, we have enough tools to analyze Schaffer's theory of truthmaker monism and grounding in an abstractionist framework.[84] Propositions will be defined as 0-place relations. The variables $p, q, r, \ldots$ range over propositions. To assert that p is false, both p and q, and necessarily p we use the expressions $\neg p$, $p \& q$ and $\Box p$.

[83] As discussed in Chapter 1, since Zalta gives different conditions for essential properties with regard to the predication type, his theory bypasses the problems with modalist accounts of essence that are pointed out in Fine (1994). For further discussion see Linsky and Zalta (1994), Zalta (2006).

[84] All of the definitions and theorems here are adopted from Zalta (1983, p. 77–84), Zalta (1993, p. 410–418).

Since we have an expressible relation for any closed exemplification formula by the Relations axiom and propositions are defined as 0-place relations, for any exemplification formula ϕ, there is a corresponding proposition as well.

Propositions: $\exists p \Box (p \leftrightarrow \phi)$, where ϕ has no ps, encoding formulas or free variables.[85]

We can also use the λ-equivalance on propositions because the Propositions axiom is a particular case of the Relations axioms where $n = 0$. So, p iff being such that p.

p-λ-Equivalance: $p \leftrightarrow [\lambda x p]$

We can construct a property out of propositions by using p-λ-Equivalence and Propositions which will be called proposition-properties. By Propositions, for every exemplification formula there is a proposition p. By p-λ-Equivalence, p iff being such that p. So, for any exemplification statement we have a proposition-property.

Zalta shows that there are different ways to model possible worlds in Object Theory. In his model for situation theory, he models possible worlds as abstract objects that have situations as their parts.[86] On the other hand, he constructs worlds as a whole in *Abstract Objects*, i.e., he models worlds without any logical parts.[87] I will not debate whether possible worlds should be taken as wholes or they are constructed out of smaller parts such as situations or facts, because truthmaker monism takes worlds as wholes. Firstly,

[85] If we replace the predicates with p's where $n = 0$ in Relations, we get this result.
[86] Zalta (1993, p. 414).
[87] Zalta (1983, p. 79).

worlds are consistent and maximal objects. Secondly, since worlds are abstract objects, they encode properties, and the properties they encode are proposition-properties.[88] Therefore, we can define worlds as consistent and maximal abstract objects that encode proposition-properties.

$\text{Max}(y) =_{df} \forall F(yF \vee y\neg F)$

$\text{Cons}(y) =_{df} \neg\exists p\exists q(\neg\Diamond(p\&q)\&y[\lambda xp]\&y[\lambda xq])$

$\text{World}(w) =_{df} A!w\&Cons(w)\&Max(w)\&\forall F(wF \rightarrow \exists p(F = [\lambda xp]))$

We can define a truth relation between worlds and propositions according to our extensional definition of truth in our metalanguage.[89] A proposition p is true at w, $T(p, w)$ iff w is a member of the encoding extension of p. As a consequence of this definition, a world encodes only true propositions at that world.

Since we have defined both propositions and worlds, all we need to present is the relation between worlds and propositions in order to construct Schaffer's truthmaking relation: grounding. We will represent the grounding relation with "$\vDash$", e.g., x grounds y is represented as $x \vDash y$. Moreover, Schaffer's truthmaker monism states that worlds themselves are the grounds for truths. Since we defined worlds as abstract objects that encode true propositions, we can define the grounding relation between a world and a proposition with

[88] As it is discussed in Chapter 2, propositions are defined as sets of worlds. In this case, since worlds encode proposition-properties, the representation of worlds as objects that encode proposition-properties works similarly. Worlds are in the encoding extension of proposition-properties.

[89] Schaffer also assumes that truth is a two-place relation between a proposition and a world. Schaffer (2010, p. 309).

encoding. It is important to note that the grounding relation is different from other relations. Firstly, it is neither a relation in the metalanguage nor in the object language. In other words, when we talk about the grounding relation we neither talk about certain formulas grounding each other, nor do we talk about a relation that is in the domain of relations. It is defined as encoding and shall be taken primitively. My reasons to take this relation as encoding is to avoid certain paradoxes such as the Clark Paradox.[90] As a consequence of this, I take the truthmaking relation, which is the grounding relation, as encoding.[91] This would also allow us to maintain the correspondence between the grounded and encoded truths. Since all the truths that are grounded by a world are also encoded by that world we can say that: a world w grounds p iff w encodes the proposition-property being such that p.

$w \vDash p =_{df} w[\lambda x p]$

Since we defined the grounding relation with encoding, we can define identity conditions for worlds in terms of their grounding relations. Abstract objects are identified by the properties they encode by ID-A!. Any two abstract objects are identical iff they encode the same properties. In this case, worlds w and w' are identical iff they encode the same proposition-properties. Consequently, worlds w and w' are identical iff they ground the same propositions:

IdG: $w = w' \leftrightarrow \forall p((w \vDash p) \leftrightarrow (w' \vDash p))$

[90] Clark (1978, p. 183), Bueno et al. (2014, p. 13, 14).

[91] This is not something unusual in the history of Object Theory. The "making it factual" relation in the axiomatization of situation theory is also taken similarly.

We also need to show truthmaker maximalism, i.e. every truth has a truthmaker. Defining worlds as maximal and consistent objects gives us truthmaker maximalism. Firstly, since we defined grounding as encoding I can change the encoded properties in the defintions above with grounded propositions. A world is maximal iff for every proposition it is either grounded by w or its negation is grounded by w. A world is consistent iff a world w does not ground both the propositions p and its negation. Since worlds are both maximal and consistent, every truth is grounded by a world where its negation is not grounded. So, every truth is grounded by a world, and hence every truth has a truthmaker.

As I have mentioned above, uniqueness of the actual world is a desired feature of abstractionist theories.[92] We can define a unique actual world($w_@$) as the world that grounds all non-modal true propositions. Defining it as such makes us able to distinguish the actual world from other worlds ontologically. since propositions are the entities that identify the world, and the propositions that are grounded by the actual world correspond with the non-modal truths. In other words, if a proposition p is grounded by the actual world, then p.

Actual (w) $(w_@) =_{df} \forall p((w \vDash p) \rightarrow p)$

Act-Uni: $\exists! w(w = w_@)$

Since we are interested in the grounding relation concerning modal truths

[92]Two general premises of the abstractionist account of possible worlds as explained in the beginning of section 1: (1) possible worlds can be reduced to modalities and (2) the actual world is a distinguished world.

in an actualist conception of possible worlds, non-actual worlds should include some sense of possibility. We can provide it by stipulating that possibly, every proposition that a world grounds is true. Since what makes a world a possible world is the possible truth of the propositions it grounds, this theorem explicitly shows that possible worlds as abstract objects are reduced to modalities which is the second intuition of abstractionist conception of worlds. So, we define possible worlds as follows:

w is a possible world $=_{df} \Diamond(\forall p)((w \vDash p) \rightarrow p)$

We have two more theorems that represent the general intuitions about possible worlds and modality. In this theory, primitive notions of modality are in the object language and possible worlds are defined in terms of them.[93] So, this conception of possible worlds does not take worlds as primitive objects and gives an extensional account of modality. There are two theorems regarding the relation between modal notions and possible worlds. Firstly, a proposition is necessarily true when it is grounded by all possible worlds. Secondly, a proposition is possibly true when it is grounded by some possible world.

$\Box p \leftrightarrow \forall w(w \vDash p)$

$\Diamond p \leftrightarrow \exists w(w \vDash p)$

Lastly, since if an abstract object encodes a property, it both possibly and necessarily encodes the property, any proposition-property encoded by a world will also be possibly and necessarily encoded. Given the definition

[93]Zalta (1993, p. 418).

of grounding, when worlds ground propositions, they both possibly and necessarily ground them.

Lemma 2: $(w \vDash p \leftrightarrow \Diamond(w \vDash p))\&(\Diamond(w \vDash p) \leftrightarrow \Box(w \vDash p))\&(w \vDash p \leftrightarrow \Box(w \vDash p))$

3.4 Truthmaker Monism and Its Problems

Since we have integrated worlds, propositions and the grounding relation in Object Theory, we have showed that there can be a logical system that can represent our truthmaker account in which the semantics consists of the domain of objects —which includes worlds— and relations. In this section, I will look at the metaphysical interpretation of this semantics by combining both the metaphysical assumptions of Schaffer's truthmaker theory and the assumptions of Zalta's Object Theory.

The definition of the grounding relation between the proposition p and the world w in Zalta's abstractionist conception has the consequence that world w encodes the proposition-property $[\lambda xp]$. Since any encoded property is necessarily encoded, w necessarily encodes $[\lambda xp]$. Thus, according to the modalist views of essence, $[\lambda xp]$ is an essential property of w.[94] Moreover, the theorem IdG states that two worlds are identical if they ground the same propositions. Since proposition-properties are essential properties of the worlds, and grounding is defined with encoding, proposition-properties determine the identity of worlds.

[94]See footnote 75.

Furthermore, according to Lowe's criterion of individuation, "individuation in the metaphysical (as opposed to the cognitive or epistemic) sense , is a *determination relation between entities*: the relation that obtains between entities x and y when x determines or 'fixes' (or at least *helps* to determine or 'fix') *which* entity of its kind y is.[95] He adds that the individuation relation is not a contingent relation, rather, it is a necessary relation.[96] He also claims that individuators are the individual essences of worlds. He gives the Axiom of Extensionality as an example for a criterion of identity that is in accordance with its criterion of individuation.[97]

Axiom of Extensionality: If x and y are sets, then $x = y$ iff x and y have the same members.

Since the condition for two sets to be identical is that they have the same members and this condition holds necessarily, members are the individuators of the sets and they are the individual essences of the sets. In other words, the members of a set determine what kind of set it is. Hence, individuation and identity of sets are dependent on their members. According to the definitions above, the identity conditions for worlds (IdG) are similar to the identity conditions for sets. So, the relation between worlds and propositions can be thought as a similar relation as well. Firstly, as I have mentioned above, proposition-properties are the essential properties of worlds and they determine the identity of worlds. Secondly, since the grounding relation

[95]Lowe (2012, p. 217).
[96]Lowe (2012, p. 224).
[97]Lowe (2012, p. 224).

holds necessarily, the determination relation is not a contingent relation but a necessary one. Thus, it can be derived that identity and individuation of worlds are dependent on propositions as with the relation between sets and their members. I will take this dependence relation as a type of ontological dependence because proposition-properties can be considered as constitutive essences of worlds, and the dependence relation between constitutive essences and objects themselves is considered to be ontological dependence.[98] Both Koslicki and Fine construe constitutive essences as the entities that are the components of the real definition of the objects.[99] We can construct the definitional relation between the *definiendum* and the *definiens* as "to be x is to be y" in which x is the *definiendum* and y is the *definiens*. For example, the constitutive essence of the singleton Socrates, the property of having Socrates as its only member, can be found in "To be the singleton Socrates, is to have Socrates as its only member". In our case, the definitional relation would be "To be a world, is to be maximal, to be consistent, to be an abstract object, and to encode proposition-properties"[100] which reveals that proposition-properties are the constitutive essences of the worlds. Consequently, since propositions are the constitutive essences and the individuators of the worlds, then worlds ontologically depend on them. Therefore, worlds are ontologically dependent on propositions.

[98]Fine (1995, p. 275, 276), Koslicki (2012, 186-206).

[99]There are slight differences between Koslicki's and Fine's account of constitutive essences, but I will not argue for one of these positions because the choice between the two would not change the outcome of my argument.

[100]The definition of World and the theorem Worlds-MaxCons in section 1.2.

However, one of the metaphysical assumptions concerning grounding was that grounds are independent and grounded objects are dependent on their grounds, and metaphysical monism holds that worlds ground propositions. This would mean that worlds are supposed to be independent, but we have seen that worlds are dependent on propositions. What does this consequence show us? One option is that the grounding relation is a symmetric relation, i.e., worlds ground propositions iff propositions ground worlds. This interpretation enables us to preserve both ontological dependence and truthmaking relations between worlds and propositions. Nevertheless, as was mentioned above, the relation should be asymmetrical because the criterion (3) in Chapter 2 asserts that the truthmaking relation should be an asymmetrical relation. Since the classical formulation of truthmaking, "x is true in virtue of the existence of y", is asymmetrical because the truth of x is determined and explained by y and not vice versa, the grounding relation should also be asymmetrical in order to be considered as a truthmaking relation. Therefore, making the grounding relation symmetrical while expecting it to cover truthmaking would not be successful.

Another option is to separate ontological dependence from grounding, and retain the asymmetry and irreflexivity of the grounding relation. Since one of the main reasons for having a truthmaker theory is to *explain* the truths, and explanation in truthmaking relation is an irreflexive and asymmetric relation, we want to preserve them in our truthmaker theory of grounding.[101]

[101]Rodriguez-Pereyra (2005, p. 19).

In addition, we also want to preserve grounding's ability to distinguish the fundamental from the derivative in order to identify the entities that both explain and determine the truths. Therefore, we need to preserve the grounding relation's ability to distinguish the fundamental from the derivative and its asymmetry in order to keep it as a truthmaker relation.

However, if we omit the ontological dependence assumption from the grounding relation, how are we going to preserve its ability to distinguish the fundamental from the derivative? Are not ontological dependence and fundamentality tightly connected? I would like to look at some examples of explanatory relations in the proposed account of grounding as a truthmaking relation in Object Theory before answering these questions. The counterfactual proposition "If cars had not been invented, then we would have been traveling with horses" can be true *because* there can be a possible world where no vehicles have been invented. The counterfactual proposition would be true *because* of how that world is. The negative existential "There are no dragons" is true because the actual world does not contain any dragons. Hence, it is true *because* of how the actual world is. In these cases, we observe that the explanation of the truth is given in terms of the world because the truth is defined as a relation between a world and a proposition in our semantics as Schaffer suggests. Since the grounding relation as defined above, takes the world as the ground and the truth as the grounded, it still manifests the explanatory relation between the truth and the world. However, it does not necessarily maintain the ontological dependence, it merely

distinguishes the *semantically fundamental*, worlds, from the *semantically derivative*, the truth. Thus, when we give an explanation of the truths, we refer to the modal reality, i.e., abstract possible worlds. This reveals that the truth is semantically grounded in the worlds, and consequently semantically dependent on the abstract possible worlds. Therefore, we can still use the grounding relation as our truthmaker relation even though it is separated from ontological dependence, because it still distinguishes the semantically fundamental, the *explanans*, from the semantically derivative, *explanandum*.

This kind of explanation without relying on ontological dependence can be found in other cases as well. For example, the reason why "Sherlock Holmes is a detective" is true is *because* of how the story is written, even though the story itself is ontologically dependent on the sentences that are written. So, the story itself is semantically more fundamental than the proposition "Sherlock Holmes is a detective" without having to be the ontological substance. Nonetheless, supposing that a revised grounding relation with the desired properties can be defined, does the revised grounding relation capture what is expected from a truthmaking relation? As argued above, the truthmaking relation should capture both the explanatory relation between the truthmaker and the truth, and the determination relation between the truthmaker and the truth, but we have not talked about the determination relation yet. In Schaffer's account, ontological dependence works as the determination relation between the truth and the truthmaker, but can our metaphysically weaker account of grounding work as a determination rela-

tion as well? We can look at the other criteria that are given in the Chapter 2. Firstly, truths require truthmakers which would manifest the necessary relation between the truthmakers and propositions (4a), i.e., necessarily, if p is true then there is some entity in virtue of which it is true.[102] This criterion's translation into our theory would be, necessarily if p is true, then there is a world w that grounds p. Since we defined truth as a relation between a world and a proposition in our semantics as "p is true at w iff w is a member of the encoding extension of p" and encoding extension of a proposition does not vary from world to world, it necessarily holds. In other words, if p is encoded by a world, then it is necessarily encoded. We also define the grounding relation with encoding, so any truth will be necessarily grounded by the world that encodes it. Hence, truthmakers also necessitate the truths in our theory. Secondly, the criterion (4b) states that for an entity to be a truthmaker for a truth, it should be a part of the reality that is the subject matter of the truthbearer.[103] In our case, the question whether worlds are the parts of reality that is the subject matter of the truthbearer does not have a satisfactory answer. Since we define propositions as 0-place relations, the argument that Schaffer gives for the worlds as subject matters of propositions does not hold. As it is argued in Chapter 2, in the Lewisian conception of worlds, propositions can be thought as sets of worlds which enables Schaffer to say that the subject matter of a proposition are worlds.

[102]Rodriguez-Pereyra (2005, p. 18).
[103]Rodriguez-Pereyra (2005, p. 21).

In our account, we can only give an analogous argument. Since a proposition is a 0-place predicate and its extension consists of possible worlds, and each possible world in the extension encodes the proposition, we can say that in Zalta's theory the relation between propositions and worlds corresponds to the relation between propositions and worlds in Lewisian terms. However, the analogy is a very weak one, because neither propositions nor worlds are defined in the same way. So, this account fails to satisfy the condition (4b).[104]

Moreover, this account does not satisfy some of the other assumptions that some truthmaker theories might hold. Firstly, our truthmakers are not contingent entities, they are necessary beings. However, this does not mean that every truth is a necessary truth. Since we defined truth as a relation between a proposition and a world, our truthmaker theory changes to "a truthmaker is that in virtue of which something is true at a world". For example, when a world w_1 grounds the proposition p, it makes p true at w_1. So, our theory can give an account for contingent truths even though truthmakers necessarily exist, but we need to accept that truthmakers only make propositions true at a world. Secondly, this leads us to have a different truthmaker treatment for necessary truths. For necessary truths, we fail to find a single entity that makes them true, since p is a necessary truth when it is true at every possible world. So, the truthmaker of necessary truths is not a single world, but all possible worlds.

[104] A very similar theory which satisfies the condition (4b) can be given by using Zalta's theory of situations.Zalta (1993)

Therefore, when we analyze the grounding relation as a truthmaker relation with the abstractionist conception of possible worlds, either we need to take the grounding relation as a symmetric relation or we need to drop the ontological dependence assumption to preserve asymmetry. The grounding relation without the ontological dependence assumption can distinguish the semantically fundamental from the derivative, which makes it able to manifest the explanation relation that is expected from truthmaker theories. Moreover, our definition of the grounding relation maintains that worlds still necessitate truths without being the part of reality that is the subject matter of the truthbearers. So, the grounding relation without ontological dependence can still do most of the things that are expected from the "in virtue of" relation. Hence, it can still be defended as a truthmaker relation even without the neo-Aristotelian assumption, ontological dependence.

4 Actualism or Possibilism

In this chapter, I will try to settle the debate over whether Linsky and Zalta's theory is an actualist theory with regards to the theory we developed in Chapter 3. Firstly, I will argue that the constructed theory of truthmaking and its semantics is an actualist theory. Secondly, I will look at other actualist theories in order to show that this new approach is also compatible with them. I will start by looking to the abstractionist accounts for worlds namely, Adams' actualist theory, and McMichael's actualist theories. Then, I will look at Armstrong's combinatorial account on worlds, and briefly discuss the essentialist approach on modality. Lastly, I will argue that given the similarities of this approach on worlds and other actualist reductions, we can conclude that the Linsky and Zalta account together with the truthmaker theory we developed for *de re* modal propositions is an actualist theory.

Firstly, as discussed in Chapter 3, the constructed theory satisfies the two general theses of an actualist reduction of possible worlds: (1) the actual world is a unique object (2) worlds are reduced to modalities. Secondly, since we constructed our truthmaker theory in Object Theory, we have a logical system that represents grounding and worlds. Moreover, since we are working under the assumption that the semantics of our logic gives us the right metaphysical system, we should look at our semantics to see whether it is an actualist system. As the truthmaker theory is constructed, the worlds are abstract objects and they ground the propositions. For our explanation for

the modal proposition "Wittgenstein's second son could have been a priest", we use a world w as the object that grounds its truth. As discussed in Chapter 3, abstract objects are actual objects, so another source of explanation for the truth of the *de re* modal proposition can be given by its truthmaker, i.e. an abstract world. Therefore, our alternative source of explanation for *de re* modal truth seems to be an actualist source.

We can look at other actualist theories in order to consider their treatment of worlds. Even though the other prominent actualist theories do not claim to be actualist solely based on the nature of possible worlds, they still try to conceptualize possible worlds in such a way as to fit to actualism. Firstly, Adams defines world stories as maximal and consistent set of propositions.[105] He also distinguishes two different types of truths, namely truth-in a world and truth-at a world.[106] Truth *in* a world refers to the propositions that are *in* the world stories. For example, the proposition "Donald Trump exists" is true in the actual world, so it is in the actual-world story. On the other hand, the proposition "Sherlock Holmes exists" is not true in the actual world story. However, the proposition "Sherlock Holmes does not exist" is also not true in the actual world story, but it is true *at* the actual world story. We distinguish truth-at-a-world from truth-in-a-world by using modal reasoning. If the world-story were actual, then the proposition would be true-at-that-world. Negative existential propositions about the objects that

[105] Adams (1974, p. 225), Adams (1981, p. 21).
[106] Adams (1981, p. 22).

do not exist in a possible world are never true in that world, but they are only true at that world. So, in this theory we do not commit to the existence of objects that could have existed in a different possible world. Moreover, all the propositions that are true in a world are also true at a world, but not vice versa.

Adams justifies the truths at a world by claiming that they are the propositions that characterize the world, even though they are not internal to it. Let us assume a world w in which Donald Trump does not exist. Adams thinks that when we look at w from the actual world, we can see that w represents a world without Donald Trump because the propositions "Donald Trump exists" is not true-in-that world, so the proposition "Donald Trump does not exist" correctly describes that world. Hence, it is true at that world. When we try to analyze his theory in terms of the explanations, we can say that the proposition "Donald Trump does not exist" is true at the world w not in virtue of another object or property etc., it is true in virtue of how the world is. It is not the non-existence of an object that provides the explanation for the truth, but that proposition is true-at-that world because it correctly represent how that world is. At least we can see that the approach that is considered in Chapters 2 and 3 are parallel to Adams' account, since he is also using worlds or the way the worlds are as the explanation of truth-at world. Even though Linsky and Zalta commit to the contingently non-concrete objects as the denotations of the terms unlike Adams, the alternative source of explanation is parallel at least in terms of truths at a world. Therefore,

when Linsky and Zalta's account is combined with the presented truthmaker account, it is similar to one of the prominent actualist theories in terms of the source of explanation.

Secondly, McMichael develops a "role" semantics for an actualist modal logic.[107] McMichael defines "roles" as maximal possible qualitative properties.[108] In other words, roles are the qualitative ways the individuals are. Qualitative properties are properties that do not contain any object in them such as "being red", "being a square" etc. Moreover, he defines worlds as qualitative entities as well, which do not have individuals as constituents. They are defined as 0-place maximal possible qualitative states-of-affairs. Furthermore, unary "roles" of actual individuals include possible worlds, and qualitative relations as well.[109] Roughly, inclusion is a relation between properties and relations. The property F includes the property G just in case when the object x exemplifies F, it also exemplifies G. For example, the property "being red" includes "being colored", since when an object exemplifies the property "being red", it also exemplifies the property "being colored"[110], which are exemplifiable by objects and are purely qualitative.

Given the definitions above, the actual object Donald Trump has a unary role, which includes various qualitative properties and relations he exemplifies along with the maximal qualitative states-of-affairs actual world. In his

[107] McMichael (1983).
[108] McMichael (1983, p. 76).
[109] McMichael (1983, p. 76).
[110] McMichael (1983, p. 76, 77).

semantics, the sentence "It is possible that Donald Trump is not the president" is true because the unary role that Donald Trump exemplifies in the actual world is accessible to another unary role which does not include the qualitative property being the president. He uses the worlds—0-place roles—in order to give an account of negative existential propositions about contingent objects. For example, "It is possible that Donald Trump does not exist" is true because there is a 0-place role that is accessible to Donald Trump's actual unary role, which cannot be exemplified by Donald Trump. He says:

"Socrates' nonexistence is possible not because there is a role accessible to his actual role that includes, in Meinongian fashion, nonexistence, but because there is a role accessible to his actual role that is not really a role for *him* at all. It is not a role for him, because there is no sense in which Socrates could fill a role of zero arguments."[111]

Regarding McMichael's theory there are two issues that I would like to highlight. Firstly, he defines worlds as abstract entities that include 0-place states-of-affairs, which is parallel to the way we defined where worlds as abstract objects. So, the nature of worlds that we defined is parallel to his account as well. Secondly, he uses worlds in the explanations of the modal negative existential propositions as Adams does, which is also parallel to our account where the truth of a possibly negative existential is explained in terms of an abstract possible world. Therefore, the function and the nature of the possible worlds is our theory is similar to both Adams' and McMichael's

[111]McMichael (1983, p. 78).

use and definition of possible worlds. It shows us that our theory is not highly different from other actualist accounts on possible worlds.

Armstrong's combinatorial account is another way to develop an actualist account of modalities. He gives a deflationary account of truthmakers for negative modal truths. He starts with the idea that, for every contingent truth, there is a shadow truth following it.[112] For example, the contingent truth "The table is red" entails the truth "Possibly, the table is not red" because the possible contradictories are essentially embedded in the contingency of those objects. He also supports his claim by arguing that in S5 modal logic any truth is necessarily possible, so the modal truths are embedded in the actual truths as well. Based on these arguments, he claims that the truthmakers for modal truths are identical to the truthmakers of actual truths, since whatever makes the actual truths true also makes the modal truths true. However, actual truthmakers cannot give an account of truths about possibly existing alien objects and properties.[113] He uses the, totality of beings and properties, a second-order fact[114] as the truthmaker of the truth about alien objects and properties. He uses a similar deflationary reasoning that he used for negative possibilities with the general facts.[115] So, the actual general facts "these are all the objects(or properties) there is" entails "It is is possible that these are not the all the objects (or properties) there

[112]Armstrong (2004, p. 84).
[113]Armstrong (2004, p. 87).
[114]As discussed in Chapter 2, he commits to the existence of general facts.
[115]Armstrong (2004, p. 89).

is" which entails "Possibly, there are alien objects (or properties)". Hence, the use of totality of beings and the deflationary reasoning above makes him able to call the general facts the truthmakers of possible alien objects and properties. For positive modal truths, he uses the internal relation of *combinability* as his justification for actual truthmakers of positive *de re* modal truths. He attributes the internal relation "x is combinable with y" to the objects and universals.[116] He takes it as a primitive nature of the objects and the universals. By stipulating this, he is able to use the actual object and the universal as the truthmakers of the *de re* modal truths, since he uses them as the truthmaker of the compatibility relation as well. In other words, the object x and the property y are truthmakers of "x is combinable with y" which entails that "Possibly, x is y. However, he falls short on providing a criterion for what object is combinable with which universal. He justifies it by appealing to the nature of the objects and universals.[117]

It is important to note that Armstrong takes modal properties as primitive features of actual objects. Firstly, the relation of "x combinable with the property F" is a big part of the explanation of positive *de re* modal truths. This relation is taken primitively and its truthmaker lies in the nature of the object and the universal. But, the "nature" of these entities are not further explained. So, he takes natures as primitives and justifies his explanation based on them. Secondly, Armstrong relies on primitive notions of

[116] Armstrong (2004, p. 91).
[117] Armstrong (2004, p. 93).

nature in his deflationary explanations for negative modal truths and modal truths about alien objects. As is mentioned above, he argues that facts entail their modal contradictories in virtue of themselves (both general and singular facts), which shows that he appeals to the nature of the facts for his explanation of negative modal truths and modal truths about alien objects.

This is also a common feature of essentialist accounts on modality, in which the essences of entities are taken to be primitive —they exist in virtue of the existence of the object— and determines the modal properties of objects.[118] Even though essences or natures exist in virtue of the existence of a concrete entity, these natures (or essences) are still abstract metaphysical entities. In the theory presented above, worlds are taken to be abstract, semantically and explanatorily fundamental. However, in contrast with Armstrong's combinatorialism or essentialist accounts, the semantically and explanatorily fundamental entities are not ontologically dependent on concrete entities. We can formulate the two accounts as follows:

- Naturalist accounts: Modal propositions are true in virtue of the nature of the object x
- Abstractionist accounts: Modal propositions are true in virtue of the abstract worlds.

The immediate explanation for the truth of modal propositions in both of the cases is the abstract entities, nature or worlds. However, naturalist

[118]See Koslicki (2012), Hale (2013), Fine (1994), Lowe (2009).

views take those abstract entities to be ontologically dependent on concrete entities as opposed to the abstractionist ones. Does the difference between the abstractionist and naturalist account of truthmakers matter with regard to the conclusion of the debate? I will say no for three different reasons. The first reason is that in both of the cases we appeal to an abstract entity in order to explain the truth of a modal proposition, which shows that abstract entities are not suspected of being merely possible entities. Secondly, if we assume that only concrete entities are ontologically "worthy" of being actual, then any modal semantics based on a mathematical or a logical entity, would also be possibilist, since mathematical and logical entities are generally taken as abstract objects. Thirdly, abstract worlds are taken to be necessary entities in the theory we developed. Since they are necessary entities, they are not merely possible entities, which means that they also exist in the actuality. Therefore, even though naturalist accounts of truthmakers make the natures dependent on concrete entities, the difference does not make an abstract object a merely possible entity. They are still legitimate actual objects that explain *de re* modal truths, which shows that our theory is not greatly different from naturalist approaches from an actualist perspective.

Lastly, even though this account provides an alternative way to defend actualism, it does not provide answers to following problems. Firstly, it does not provide an answer to Bennett's or Menzel's criticisms for contingently non-concrete objects. It only shows that Linsky and Zalta's theory combined with abstract possible worlds as truthmakers can also be defended as an actu-

alist theory. Secondly, this theory also assumes necessitism, i.e., every object in the domain necessarily exists. However, by implementing truthmakers to our semantics, it tries to show that there is still room for a debate between actualism and possibilism in modal metaphysics as opposed to Williamson's arguments. So, rather than arguing against the debate between necessitism and contingentism, it shows that we can still have a debate between actualism and possibilism.

Conclusion

In conclusion, we have combined both of the metametaphysical assumptions by integrating our truthmaker theory with Zalta's Object Theory, namely that semantics is the guide to the metaphysics, and that an actualist approach should contain more metaphysical qualifications than merely existing in the domain. We have also showed that worlds—or other abstract entities— as the alternative explanatory source for *de re* modal claims are used in other actualist theories as well. Therefore, we can conclude that when Linsky and Zalta's theory is combined with the presented account it can be considered as a genuine actualist theory; because (1) we have another actual object that is an alternative source of explanation for *de re* modal claims which gives us the lacking metaphysical qualifications, (2) it can be integrated into our semantics.

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Appendix

The language of Quantified Modal Logics

- Individual Constants: $a, b, c, \ldots$
- Individual Variables: $x, y, z, \ldots$
- Predicates: $P^n, Q^n, \ldots$
- Propositional variables: $p, q, r, \ldots$
- Connectives: $\rightarrow$, $\neg$
- Quantificational Quantifiers: $\forall$, $\exists$
- Modal Operators: $\Box$, $\Diamond$

Axioms of Modal Logics

- Axioms: Axioms of propositional logic:
  - Axiom 1: $A \rightarrow (B \rightarrow A)$
  - Axiom 2: $(A \rightarrow (B \rightarrow C)) \rightarrow ((A \rightarrow B) \rightarrow (A \rightarrow C))$
  - Axiom 3: $(\neg A \rightarrow \neg B) \rightarrow ((\neg A \rightarrow B) \rightarrow A)$
- Axioms of First-Order Quantified Logic:
  - Axiom 4: $\forall x \phi \rightarrow \phi^{\tau}_{x}$, where τ is any term substitutable for x.
  - Axiom 5: $\forall x(\phi \rightarrow \psi) \rightarrow (\phi \rightarrow \forall x \psi)$, where x is not free in ϕ

- Axiom 6: $x = x$ [119]
- Axiom 7: $x = y \rightarrow (\phi(x, x) \rightarrow \phi(x, y))$, where $\phi(x, y)$ is the result of substituting y for some, but not necessarily all, occurences of x in $\phi(x, x)$, provided that y is substitutable for x at those occurrences.

- If we add the following axioms and the rules to the axioms above, we will have the SQML.
  - K Axiom: $\Box(\phi \rightarrow \psi) \rightarrow (\Box\phi \rightarrow \Box\psi)$
  - Barcan Formula: $\forall x \Box Fx \rightarrow \Box \forall x Fx$

- Rules
  - Modus Ponens(MP): If $\vdash \phi \rightarrow \psi$ and $\vdash \phi$, then $\vdash \psi$
  - Universal Generalization: If $\vdash \phi$, then $\vdash \forall\phi$
  - Rule of Necessitation: If $\vdash \phi$, then $\vdash \Box\phi$

- If we add the following axiom and drop the Barcan Formula, we will have the S5QML.
  - S5 Axiom: $\Diamond\phi \rightarrow \Box\Diamond\phi$

[119] Note that one can construct the S5QML without identity if one does not add the Axiom 6 and 7.

Satisfaction and Truth at a world in S5QML

- $\mathbf{f}$ satisfies$_{\mathbf{M}}$ $F^n\tau_1, \ldots, \tau_n$ with respect to(wrt) w just in case $< (\mathbf{d}_{\mathbf{M},\mathbf{f}(\tau_1)}, \ldots, (\mathbf{d}_{\mathbf{M},\mathbf{f}(\tau_n)})) > \in [\mathbf{V}(F^n)](w)$
- $\mathbf{f}$ satisfies$_{\mathbf{M}}$ $\neg\psi$ wrt w just in case $\mathbf{f}$ fails to satisfy$_{\mathbf{M}}$ ψ wrt w
- $\mathbf{f}$ satisfies$_{\mathbf{M}}$ $\phi \rightarrow \psi$ wrt w, just in case either $\mathbf{f}$ fails to satisfy$_{\mathbf{M}}$ ϕ wrt w or satisfies$_{\mathbf{M}}$ ψ wrt w
- $\mathbf{f}$ satisfies$_{\mathbf{M}}$ $\forall x\phi$ wrt w just in case for every **f'**, if $\mathbf{f} \approx$ **f'**, then **f'** satisfies$_{\mathbf{M}}$ ϕ wrt w
- $\mathbf{f}$ satisfies$_{\mathbf{M}}$ $\Box\phi$ wrt w just in case for every w, $\mathbf{f}$ satisfies$_{\mathbf{M}}$ ϕ wrt w
- ϕ is true $_{\mathbf{M}}$ at a world w just in case every assignment $\mathbf{f}$ satisfies$_{\mathbf{M}}$ ϕ wrt w
- ϕ is true $_{\mathbf{M}}$ iff ϕ is true $_{\mathbf{M}}$ at $w_@$