<u>Pictures, Perspective and Possibility</u>[1]

I

Depictions, like thoughts and sentences, distinguish between different ways things might be; the Mona Lisa, for example, represents Lisa by distinguishing amongst the various possible ways which Lisa might have looked. This motivates the application of possible world semantics – which has proved useful in the analysis of the content of language, thought, perception, fiction and so on – to depiction; it suggests that the content of the Mona Lisa, for example, should be analysed in terms of the possible worlds in which Lisa's appearance is as the picture portrays. This paper defends the combination of possible world semantics with a resemblance theory of depiction.

I will argue for three complications to the analysis of depictive content in terms of possible worlds. Firstly, perspective pictures require an analysis in terms of centred possible worlds, or ordered quadruples of orientations, locations, times and possible worlds. Secondly, depictions of a posteriori impossibilities require an analysis in terms of two-dimensional intensions, or functions from centred possible worlds to sets of possible worlds. And thirdly, depictions of a priori impossibilities require an analysis in terms of structured two-dimensional intensions, or ordered n-tuples of functions from centred possible worlds to objects and properties.

The application of possible world semantics to depiction deserves separate discussion for two reasons. First, special issues are raised by the platitude that depiction is mediated by resemblance: any analysis of depictive content ought to be consonant with this platitude. Second, the application of possible world semantics to depiction is a useful vehicle for assessing the analogy between depiction and other kinds of representation. I shall argue that the application of possible world semantics to

depiction supports both the platitude that depiction is mediated by resemblance and a strong analogy between depiction and other kinds of representation.

Two clarifications. First, the analysis of depictive content in terms of possible worlds requires no particular assumptions about their nature or existence. Possible worlds may, for example, be concrete entities like the actual world, abstract entities akin to numbers and sets, Meinongian inexistents, or merely useful fictions. Second, because 'depicts' is an intensional transitive verb, it and its cognates raise interesting problems for the application of possible world semantics to the analysis of linguistic meaning. It should be emphasised that because the subject of this paper is the content of depictions themselves, and not the words that describe them, no commitment is involved or intended to propositionalism about intensional transitives.[2]

In the next section, I introduce the analyses of depictive content in terms of possible worlds and argue that – despite appearances – it is consonant with the platitude that depiction is mediated by resemblance. In subsequent sections, I argue that the complications that have to made to the analysis of depictive content in terms of sets of possible worlds to accommodate perspective pictures and depictions of impossibilities are at least as substantial as those that have to be made to the analyses of linguistic and mental content, but that – despite appearances – those complications are all surprisingly consonant with the platitude that depiction is mediated by resemblance.

II

Depictions, like thoughts and sentences, represent particulars, properties and states of affairs. The Mona Lisa, for example, represents Lisa, the property of smiling, and the state of affairs of Lisa's smiling. But not all depictions represent particulars – not every painting of a horse, for example, is a painting of any particular horse. And although all depictions represent properties, different depictions may differ in what

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[2] See Howell (1974) and Ross (1997) for applications of possible world semantics to 'depicts' and Forbes (2006) for discussion of 'depicts' as an intensional transitive. Malinas (1991, 287-96) discusses the application of possible worlds semantics directly to depiction.

they represent without differing in the properties they represent – the property of being red, for example, may be the only property represented by both a picture of a red tablecloth and a close-up shot of a tomato soup.

It follows that a complete analysis of depictive content should be in terms of states of affairs. States of affairs, in turn, may be analysed as sets of possible worlds (Lewis, 1986, 185). The state of affairs of it's raining, for example, corresponds to the set of possible worlds in which it is raining. The state of affairs of a horse's grazing can be analysed as the set of possible worlds in which a horse is grazing: since different horses graze in different possible worlds, the state of affairs of a horse's grazing need not be the state of affairs of any particular horse doing so. Similarly, the state of affairs depicted by the Mona Lisa is the set of possible worlds in which – amongst other things – Lisa smiles.

A possible world is just a consistent and complete way that things might be. The actual world, for example, is a complete way things might be: it includes not just the earth, but also other planets, solar systems, galaxies, intergalactic space, and anything that actually exists. Other possible worlds include different planets and galaxies, but all of them are equally complete: there is no possible world which leaves any question undecided, since it is impossible for things not to be one way or another. Similarly, all possible worlds are consistent: no possible world answers any question inconsistently, since inconsistencies are impossibilities.

Prima facie, analysing depictive content in terms of sets of possible worlds is inconsonant with the platitude that depiction is mediated by resemblance, because depictions do not resemble sets of possible worlds in any relevant respects: intuitively, depictions resemble what they represent in respect of ordinary properties such as shape and colour, but sets of possible worlds do not have shapes and colours. There are, for example, red particulars, but red sets of possible worlds are no more possible than green numbers. So the fact that not all depictions represent particulars, seems to show that not all depictions resemble what they represent in relevant respects.

But although there are no relevant resemblances between depictions and states of affairs, there are relevant resemblances between depictive and depicted states of affairs, which mirror the more ordinary resemblances which obtain between particulars. Two states of affairs resemble each other – in the relevant sense – if they share the property of being states of affairs of something's having a property. A painting of a red tablecloth, for example, cannot resemble a state of affairs in respect of being red, but the state of affairs of the painting's being red does resemble the state of affairs of the tablecloth's being red, because both are states of affairs of something's being red.

<div align="center">III</div>

Many pictures represent what they do from a particular viewpoint or perspective: profile portraits, for example, represent their subjects from their sides, rather than their fronts. The analysis of depictive content simply in terms of sets of possible worlds, as Jeff Ross (1997, 73-97) has shown, is unable to accommodate perspective pictures. To illustrate the point, Ross (1997, 73) uses the following two pictures:
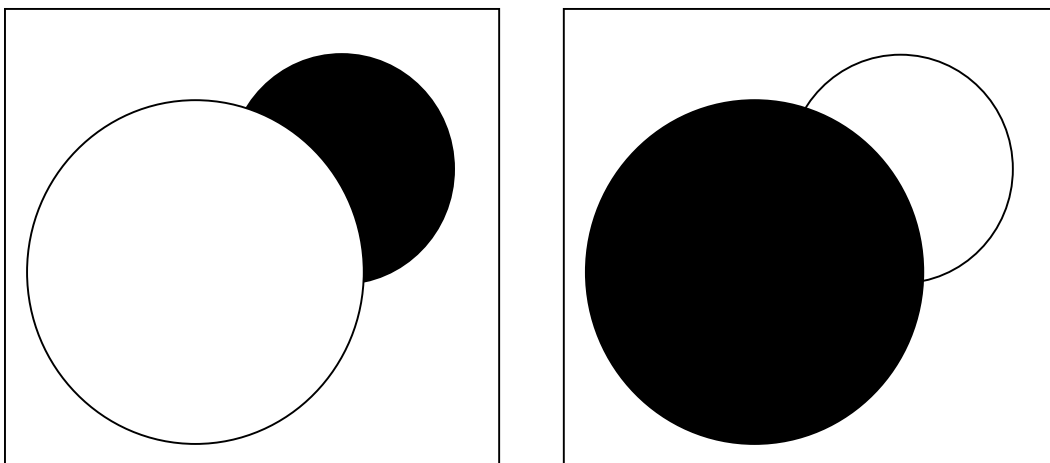
Whereas the first picture represents a white sphere in front of a black sphere, the second picture represents the same spheres from the opposite direction, with the black sphere in front.

There is an obvious difference in content between the two pictures, but there is no difference in the set of possible worlds they represent. Every possible world in which the white sphere is in front of the black sphere is also a possible world in which, from

another perspective, the black sphere is in front of the white sphere. And every possible world in which the black sphere is in front of the white sphere is also a possible world in which, from another perspective, the white sphere is in front of the black sphere. So every possible world in which the first picture is accurate is a possible world in which, from another perspective, the second picture is accurate: the two pictures represent the same set of possible worlds, but differ in content.

This is an important difficulty for analysing the content of depictions as sets of possible worlds. However, as Ross (1997, 75-6) points out, the problem is not unique to depictive representation. The analysis of the contents of thoughts in terms of possible worlds, for example, also has to be revised to accommodate beliefs with egocentric content. In the next few paragraphs I will explain, following Ross, the solution to the problem of accounting for egocentric content in general and then the application of that solution to depiction. Section four will then discuss the compatibility of that solution with the platitude that depiction is mediated by resemblance.

Consider the example, due to Lewis (1979, 139), of two gods. One lives on the tallest mountain and throws down mana; the other lives on the coldest mountain and throws down thunderbolts. Both gods know everything about which possible world they inhabit: for example, both know they inhabit a possible world with two gods, one on the tallest and one on the highest mountain. However, neither god is omniscient, because both gods are ignorant about which god they are: neither god knows whether he is the god on the tallest mountain who throws down mana or the god on the coldest mountain who throws down thunderbolts.

Because the gods already know which possible world they inhabit, their lack of knowledge cannot be analysed as ignorance about which world is actual; rather, their ignorance is about their location within the world. The solution to the problem is to analyse contents as sets of ordered triples of locations, times and possible worlds. When the gods know the time and everything about their world, the content of their knowledge can be characterised as a set of two triples. The world and time coordinate of each triple is the same, but the location coordinate is different: one triple's location coordinate is the tallest mountain whereas the other's is the coldest mountain.

One clarification. Lewis and Ross (1997, 75-83) both characterise egocentric belief in terms of the self-ascription of properties rather than triplets of locations, time and worlds. The later proposal was originally suggested by Quine (1969); Lewis (1979, 147) argues that the two views turn out to be equivalent. Ordered triples of individuals, times and worlds are often used rather than triples of worlds, times and locations: I prefer locations to individuals because I prefer to leave open the question of whether or not the point of view in some pictures is inhabited by any individual.[3] For convenience, ordered triples of locations (or individuals), times and worlds are called centred possible worlds.

The difference in content between the picture of the white sphere in front of the black sphere and the black sphere in front of the white sphere can be analysed as a difference in the location coordinates of the centred possible worlds in the sets they represent. The possible worlds coordinates of the centred possible worlds in the sets represented by both pictures are the same, but the location coordinates differ: the location coordinates of ordered triples in the set represented by the first pictures are locations to which the white sphere is closer, whereas the location coordinates of the ordered triples in the set represented by the second are locations to which the black sphere is closer.

One complication. The following four pictures illustrate that accommodating all examples of differences in perspective requires centred possible worlds to be defined as ordered quadruples of locations, orientations, times and possible worlds:
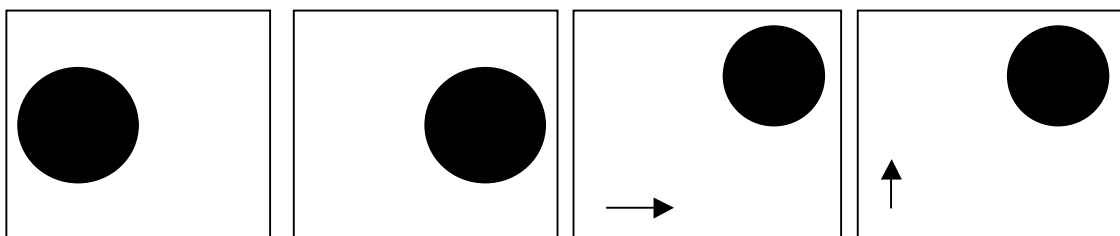
The first two pictures represent respectively a sphere to the left and the same sphere to the right. They both represent the sphere from the same location: the difference in

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[3] See Walton (1990, 337-48) and Currie (1995, 170-9) for discussion of this issue.

content is produced instead by a difference in orientation, as illustrated by the arrows in the second two pictures.

Similar examples show that the contents of thoughts and sentences must also be defined as ordered quadruples of locations, orientations, time and possible worlds: a change in orientation can change the truth of the sentence 'the sphere is to the left', for example, even while location, time and possible world are kept constant. Alternatively, if centred possible worlds are defined as ordered triples of individuals, times and possible worlds, then orientations may be dispensed with (in the analysis of linguistic, mental and depictive content) on the grounds that orientation and location may both be determined by the direction in which the individual is faced at the relevant time and possible world.

IV

Analysing depictive content in terms of sets of ordered quadruples of orientations, locations, times and possible worlds, instead of as sets of possible worlds simpliciter, is not as completely straightforward as it is for the case of egocentric beliefs. Egocentric beliefs represent that the believer is located at the centre of one of the centred possible worlds corresponding to their beliefs; in the case of pictures, this would suggest that what is depicted is the onlooker instead of, as it should be, what they look on. Perspective pictures do not represent that people are located at certain points of view, but the way things look to people when they are seen from those points of view.

Ross recognises and tries to address this problem in the following remark: "We are saying that the content of pictures, given that it includes viewpoint, must be represented as a property. But notice that what a picture *depicts* is certainly not its content-property. We shall say that a picture *represents* the property in question." (Ross, 1997, 85). Ross suggests that the problem can be solved by simply introducing a technical use of 'represents', but the problem seems to me to be deeper than this, because even if a picture does represent the viewpoint in a technical sense, an account is still required of what it depicts in the non-technical sense.

Depictive representation is not representation of the properties of viewers, but the representation of the properties of depicted objects. To solve the problem of how things can be represented by pictures from particular points of view, properties have to be found which the things have from some points of view but not others. In the case of the pictures of the black and white spheres, a distinction must be drawn between the white sphere having the property of being in the foreground and the black sphere having the property of being in the foreground. I will argue in the rest of this section that the problem can be resolved by accepting a slight and intuitive revision of the standard analysis of properties in terms of possible worlds.

The analysis of properties in terms of possible worlds is motivated by a problem for an extremely naïve theory of properties: the analysis of properties as the sets of objects that possess them. The property of red, for example, is analysed as the set of red things. The problem with this analysis is that it cannot distinguish between properties which happen to be possessed by all the same things. The property of being a creature with a heart differs from the property of being a creature with a kidney, for example, but the analysis of properties in terms of sets cannot distinguish them, because it so happens that the set of creatures with a heart and the set of creatures with a kidney are the same.

This problem can be resolved by analysing properties as functions from possible worlds to extensions, which take each possible world to the set of things possessing the property at that world. So the property of being green, for example, is analysed as the function which takes the actual world to the set of things which are actually green and other possible worlds to the sets of things which are green in those worlds. This analysis can distinguish between the properties of being a creature with a heart and being a creature with a kidney, for example, because the functions associated with each property take possible worlds in which not all creatures with hearts have kidneys to distinct sets.

Since the set of possible worlds in which the black sphere is in the foreground is the same as the set of possible worlds in which, from a different perspective, the white sphere is in the foreground, a function from possible worlds to the set of things that are in the foreground in that world cannot provide a property the representation of

which can distinguish between the two pictures. More generally, if properties are functions from possible worlds to extensions, it is not possible to distinguish between different properties that things may have from different perspectives within the same possible worlds.

This problem can be resolved by analysing properties as functions from centred possible worlds, rather than possible worlds simpliciter, to extensions, which take each ordered quadruple of orientation, time, location and possible world to the set of things possessing the property in question relative to that orientation, time location and world (Egan, 2006, 509-13). The property of being in the foreground, for example, can be analysed as a function which takes centred possible worlds in which the white sphere is closer to the location coordinate to extensions including the white sphere and centred possible worlds in which the black sphere is closer to the location coordinate to extensions including the black sphere.

So. Perspective pictures can be accommodated by taking the content of a depiction to be the set of centred possible worlds in which the depicted objects have the depicted properties, where those properties are functions from centred possible worlds to extensions, rather than functions from possible worlds simpliciter to extensions. The content of the picture of the white sphere in front of the black sphere, for example, is the set of centred possible worlds relative to which the white sphere has the centred property of being in front of the black sphere; the content of the picture of the black sphere in front of the white sphere is the set of centred possible worlds relative to which the black sphere has the centred property of being in front of the white sphere.

Originally, introducing centred possible worlds may have seemed to be problematic for the claim that depictions resemble what they represent. But the introduction of the corresponding centred properties reveals some attractive features of the combination of the resemblance theory of depiction with the claim that the contents of depictions are sets of centred possible worlds. The natural suggestion is that pictures from particular points of view resemble what they represent because they share centred properties with what they represent. Depictions resemble what they represent because they possess centred properties relative to the intended position of the viewer which

the represented objects possess relative to the point of view represented by the picture.

V

The introduction of centred possible worlds shows how perspective pictures, even though they require an important revision, can be easily accommodated within the spirit of the possible worlds framework. Impossible pictures, on the other hand, seem more threatening: the possibility of pictures of impossibilities is an obvious difficulty for the analysis of what pictures are of in terms of possibilities. Similar difficulties arise for pictures of necessities and pictures with distinct but necessarily connected subjects. The problems divide into two kinds: depictions of metaphysical or a posteriori and of logical or a priori impossibilities and necessities. Sections five and six deal with the former kind of example. Section seven will deal with the latter.

Inexistence and identity are the two main sources of a posteriori necessities and impossibilities. The inexistence of unicorns, for example, is known only empirically. Nevertheless, it is empirical knowledge of a necessary truth, since it follows from the fact that unicorns do not exist that unicorns could not have existed, because although there are numerous possible but inexistent horned horse-like species, no one of these species is uniquely entitled to be identified with the unicorn (Kripke, 1980, 156-8). It follows that depictions of unicorns – and other inexistents whose essential properties are unspecified – are depictions of impossibilities, and their content cannot be analysed in terms of the sets of possible worlds in which they are accurate, since they aren't accurate in any.

Similarly, it was an empirical and a posteriori discovery that Hesperus – the brightest star in the evening – is Phosphorus – the brightest star in the morning. Nevertheless, it was an a posteriori discovery of a necessary truth, since it follows from the identity of Hesperus and Phosphorus that Hesperus and Phosphorus are necessarily identical (Kripke, 1980, 97-105). Imagine a star chart produced before the discovery that Hesperus is Phosphorus, which depicts them as simultaneously possessing different locations. The analysis of depictive content in terms of sets of possible worlds predicts that the content of this depiction – and all other depictions of a posteriori

impossibilities – is the empty set, since there are no possible worlds in which the depiction is accurate.

One way to escape this problem would be to argue that the chart does not really represent the impossibility of Hesperus and Phosphorus possessing different locations, but merely represents the possibility of the brightest star in the evening possessing a different location from brightest star in the morning. Similarly, one may argue that pictures of unicorns do not represent any particular impossible species, but merely the general possibility of the existence of horse-like animals with horns. In general, apparent depictions of impossible states of affairs concerning particulars can be reconstrued as depictions of possible states of affairs concerning generalities.

But this strategy obscures an important distinction. There is an important difference in content, for example, between a depiction of Pegasus flying and a depiction of a flying horse – but no horse in particular – which closely resembles Pegasus. Similarly, there is an important difference in content between depictions of stars with certain properties, and of particular stars with which we are familiar: depicting Hesperus is different from merely depicting a star – but no particular star – which rises in the evening. The strategy of arguing that apparent depictions of a posteriori impossible states of affairs concerning particulars are really depictions of possible states of affairs concerning generalities obscures these distinctions.

This problem can be solved by maintaining that depictions of a posteriori impossibilities really do depict states of affairs which concern particulars, but arguing that they do so under modes of presentation which merely concern generalities. So a depiction of Pegasus' flying, for example, differs from a depiction of a horse's – but no particular horse's – flying because the depiction of Pegasus' flying depicts an impossible state of affairs corresponding to the empty set, whereas the depiction of a horse's flying does not do so, even though they both depict these different states of affairs under the same mode of presentation.

Similarly, modes of presentation can accommodate differences between depictions of a posteriori impossibilities. Although depictions of unicorns and depictions of werewolves, for example, both depict the same impossible state of affairs, they do so

under a different mode of presentation: the former represents the impossible state of affairs under a mode of presentation involving horns and horse-like features, whereas the latter represents the impossible state of affairs under a mode of presentation involving teeth and wolf-like features. In the next section, I aim to clarify this proposal and reconcile it with the platitude that depiction is mediated by resemblance.

VI

Prima facie, the introduction of modes of presentation into the analysis of depictive content is problematic for the platitude that depiction is mediated by resemblance. Depictions of a posteriori impossibilities, for example, seem to resemble neither the impossible states of affairs they depict nor the abstract modes of presentation under which those states of affairs are represented in any relevant respect. However, I will argue in this section for a two-dimensional theory of modes of presentation which is naturally and intuitively reconcilable with the platitude that depiction is mediated by resemblance.

Depictions of a posteriori impossibilities might, if things had turned out differently, have been depictions of possibilities. If, for example, it had turned out that the brightest star in the morning and the brightest star in the evening were distinct, then the chart which represents Hesperus and Phosphorus as having different locations would have represented the genuine possibility of two other possible stars having different locations. Similarly, in other possible worlds in which a horned horse-like species does exist, depictions of unicorns might have depicted the possibility of members of that species appearing in a certain way.

Just as the states of affairs depictions represent may be characterised by sets of possible worlds, the various states of affairs depictions might have represented may be characterised by two-dimensional intensions: functions from possible worlds to the set of possible worlds which a depiction would represent if that world were actual. The various states of affairs which the chart which represents Hesperus and Phosphorus as having different locations might have represented, for example, is characterised by a function which takes the actual world to the empty set, but possible

worlds in which the stars appearing in the morning and evening are distinct to sets of possible worlds in which those stars have the locations shown by the map.

Two-dimensional intensions determine which states of affairs depictions represent in each possible world, but they also determine one further state of affairs: the diagonal state of affairs is the set of possible worlds which the function takes to sets in which they're included. To illustrate, suppose there are just two possible worlds: *a* and *b*. In *a* the brightest star in the evening is the brightest in the morning, but in *b* it is not. The columns represent the states of affairs the chart would depict in *a* and *b*:

	a	*b*
a	0	0
b	0	1

The diagonal from upper left to lower right represents the diagonal state of affairs: in this case, the set of possible worlds in which the brightest stars in the morning and evening are distinct.

One clarification. In some possible worlds, what a picture would have depicted if that world were actual is completely irrelevant to its actual meaning (Schroeter, 2003). The chart representing that Hesperus and Phosphorus differ in location, for example, might have depicted sandwiches instead of stars, but sandwiches are irrelevant to its content. Resolving this problem requires either restricting the possible worlds involved to those compatible with the presuppositions of a representation's perpetrator and audience (Stalnaker, 1978) or arguing that a two-dimensional intension is part of a representation's actual content, which reflects the perpetrator and audience's understanding of how its truth depends on the facts (Chalmers, 2006).

Characterising the content of a depiction using a two-dimensional intension distinguishes between depictions of a posteriori impossibilities with different content, because different depictions of a posteriori impossibilities are associated with different diagonal states of affairs by their two-dimensional intensions. The diagonal state of affairs associated with the chart depicting Hesperus and Phosphorus, for example, is the set of possible worlds in which the brightest stars in the morning and evening are differently located, whereas the diagonal state of affairs of a picture

depicting unicorns is the distinct state of affairs of there being a horned horse-like species, even though the horizontal state of affairs of both is the empty set.

But characterising the content of a depiction using a two-dimensional intension also distinguishes between depictions of a posteriori impossibilities concerning particular and general states of affairs, because although depictions concerning particular and general states of affairs are associated with the same diagonal states of affairs by their two-dimensional intensions, they are associated with different horizontal states of affairs. A depiction of Pegasus grazing, for example, differs from a depiction of a winged horse, but no horse in particular, grazing, because the non-empty horizontal states of affairs associated with the former all concern particular horses, whereas the horizontal states of affairs associated with the latter do not.

Originally, characterising the content of depiction in terms of modes of presentation might have seemed problematic for the platitude that depiction is mediated by resemblance. But characterising modes of presentation as diagonal states of affairs resolves this prima facie inconsonance, by showing that the state of affairs of the picture's having a certain property may resemble the picture's diagonal state of affairs in respect of both being states of affairs of something's having a certain property. The state of affairs of Pegasus' portrait's being partly white, for example, resembles the diagonal state of affairs of a winged horse's being partly white, because they are both states of affairs of something's being partly white.

VII

The possibility of depicting logical or a priori impossibilities is more directly problematic for the analysis of depictive content in terms of possible worlds. Penrose's (1958, 31) triangle, for example, is a picture of an a priori, rather than a merely a posteriori, impossibility:
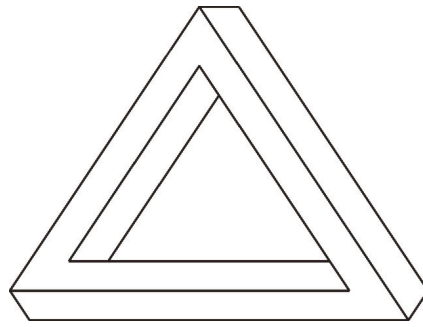
The depicted triangle does not exist in any possible world, nor would the picture have depicted an existent triangle if the world had turned out differently, so the content of the picture cannot be analysed as a set of possible worlds or two-dimensionally.

Impossible pictures like Penrose's triangle are a manifestation of a more general problem for the analysis of content in terms of possible worlds: just as it is possible to draw a priori impossibilities, it's possible to believe a priori impossibilities: a person who believes the premises but disbelieves the conclusion of a deductive argument, for example, believes an a priori impossibility. This is problematic for the analysis of the content of belief in terms of possible worlds, because there are no possible worlds in which all their beliefs are true, nor any possible worlds in which, had things turned out differently, their beliefs would have represented something true.

A natural solution to this problem is to argue that inconsistent beliefs divide into consistent partitions: although the beliefs of a person who believes the premises but disbelieves the conclusion of a deductive argument, for example, are logically inconsistent, that person's beliefs divide into consistent partitions corresponding to each premise and the conclusion's negation, and these partitions can be analysed in terms of sets of possible worlds (Stalnaker, 1984; Lewis, 1986, 34-5). Similarly, although Penrose's triangle is inconsistent, each part is consistent: covering any one of the picture's sides with a piece of paper reveals that the other two sides depict consistent parts of a triangle.

But not every depiction of, or belief in, a logical impossibility can be treated in this way. Take, for example, a picture of a straight line captioned 'square circle, side view' (Sorenson, 2002, 343). The picture depicts a logical impossibility – a square circle – but not by consisting of individually consistent parts whose combination is inconsistent: every part of the straight line depicts a part of the square circle which is

both straight and curved and therefore impossible. Since not even the parts of the straight line depicting a square circle depict possibilities, the inconsistent content of the whole cannot be analysed in terms of the consistent content of the parts.

Side view depictions of square circles do not succeed in representing impossibilities explicitly; the depiction is successful only by representing an impossibility at an angle from which it is invisible. This phenomenon is widespread: depictions which are not composed of consistent, but jointly inconsistent, parts all seem incapable of representing impossibilities explicitly. This suggests an odd disanalogy between depictive and descriptive representation, since sentences seem straightforwardly capable of explicitly representing impossible states of affairs. It seems to follow that depictions differ from descriptions not merely in whether they are mediated by convention or resemblance, but in the kind of contents that they have.

However, this apparent disanalogy between depictive and descriptive content can be more neatly explained by the platitude that depiction is mediated by resemblance, which suggests that a picture represents a property explicitly if and only if the depictive resembles the depicted states of affairs in respect of both being states of affairs of something's having that property. So the Mona Lisa, for example, represents Lisa's colour explicitly, because the Mona Lisa resembles Lisa in colour, but represents that Lisa is smiling only implicitly, because since the painting does not possess the property of smiling, the Mona Lisa does not resemble Lisa in this respect.

It follows from this characterisation of explicit representation of properties that depictions cannot represent thing's having inconsistent properties explicitly, because depictions cannot resemble things in respect of having inconsistent properties. A straight line, for example, can resemble a square circle in respect of appearing like a straight line from the side, but a straight line cannot resemble a square circle in respect of being both square and circular, because it cannot be both square and circular. The straight line depicts that the square circle appears straight from the side explicitly, but depicts that it is both square and circular only implicitly.

One clarification. Since depictions resemble what they represent only in respect of explicitly represented properties, the resemblance of a depiction to what it represents

does not determine which properties it represents implicitly. In the case of the line which depicts a square-circle, the implicit representation of the property of being both square and circular is derived from the content of the caption, whereas in the general case the implicit content of a depiction derives from its perpetrator's intentions: linguistic captions may be used to communicate those intentions in contexts, like that of the square-circle, where they otherwise wouldn't be obvious.

Even the implicit depiction of impossibilities is problematic for the analysis of depictive content in terms of possible worlds. According to that analysis, the content of a depiction is the set of possible worlds in which it is accurate, but since impossibilities do not occur in any possible world, the analysis predicts that every depiction of an impossibility has the same content: the empty set. Since neither the straight line depicting a square circle nor the straight line depicting a triangular hexagon, for example, are accurate in any possible world, both depictions are predicted to represent the empty set, when in fact what they represent is obviously different.

There are two options for dealing with this problem. The first option is to replace the analysis of depictive content in terms of sets of possible worlds with an analysis in terms of sets of worlds simpliciter, by allowing the inclusion of impossible – incomplete and inconsistent – as well as possible worlds.[4] This would accommodate depictions of inconsistencies straightforwardly, since depictions of different inconsistencies would depict different sets of impossible worlds. The set of worlds represented by the straight-line depicting a square-circle, for example, would include impossible worlds in which there is a square-circle, whereas the set of worlds represented by the straight-line depicting a triangular hexagon would not.

The introduction of impossible worlds can naturally accommodate the resemblance of depictions to what they represent, by enabling properties to be reanalysed as functions

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[4] Malinas (1991, 288) argues for an analysis of depictive content in terms of situations or incomplete (but not inconsistent) worlds. Malinas (1991, 288) also defines situations in terms of ordered tuples of objects and properties, making his proposal a combination of the two options discussed here.

from ordered quadruples of locations, orientations, times and worlds – possible or impossible – simpliciter to extensions. A depiction which represents a triangle as equilateral but not equiangular, for example, represents the triangle as having a property characterised by a function which takes all possible worlds (and other coordinates) to sets of triangles which are both equilateral and equiangular, but which takes some impossible worlds (and other coordinates) to sets of triangles all of which are equilateral but some of which are not equiangular.

However, the introduction of impossible worlds does have some costs. Because possible worlds are consistent and complete, the rules of classical logic hold within them, so that analyses in terms of possible worlds provide an analysis of an ill understood phenomenon in terms of an extremely well understood phenomenon. The possibility of depicting a horse, but no particular horse, for example, is explained by the possible worlds analysis without appealing to non-particular horses in other possible worlds, whereas the possibility of depicting an impossible horse is explained by the impossible worlds analysis only by appealing to impossible horses in the impossible worlds.

The second option is to analyse the content of depictions by introducing more fine-grained contents than sets of possible worlds, such as ordered n-tuples of objects and properties (Soames, 1987). A line that depicts a square circle on its side, for example, may depict the ordered quintuple of an object, the property of being square, the property of being circular and the centred property of being viewed from the side. Although ordered n-tuples of objects and properties are more fine grained than sets of possible worlds, the proposal remains close to the analysis in terms of possible worlds, because each ordered n-tuple of objects and properties determines a set of possible worlds in which the relevant objects possess the relevant properties.

There is an interesting disanalogy between the application of this strategy to language and its application to depiction. In the case of language, the elements of the structure represented by a sentence correspond to words and expressions of the sentence: the content of conjunctions, for example, is the ordered triple of the truth-function for conjunction and the content of each of the conjuncts. The objects and properties represented by depictions, in contrast, do not correspond neatly with parts of the

picture. This is not problematic since, as Soames points out, "Although this systematic assignment of structure to semantic contents is appealing, it goes beyond what is required…" (Soames, 1987, 226).

One clarification. Since the objects and properties represented by a picture may not correspond neatly to its parts, the appearance of the picture may not be sufficient to determine which structured state of affairs it represents. However, this problem is a manifestation of a more general problem, which is that what pictures resemble is insufficient to determine what they represent. In general, this problem for the analysis of depiction may be resolved by combining resemblance with the communicative intentions of the perpetrator: similarly, which structured states of affairs a picture depicts depends not only on which it resembles, but on which is intended.

Ordered tuples of objects and properties are fine-grained enough to distinguish between the content of all necessarily equivalent depictions only if it is possible to distinguish between the necessarily equivalent properties represented. The content of a depiction of an equiangular triangle can only differ from the content of a depiction of an equilateral triangle, for example, if it is possible to distinguish between the properties of equiangularity and equilaterality, since if equiangularity and equilaterality are the same property, there is no difference between ordered tuples of objects and properties containing equiangularity and those containing equilaterality.

The solution is to introduce structured properties as well as structured states of affairs. Structured properties and relations are ordered tuples of unstructured properties and relations. So equiangularity, for example, can be analysed in terms of an ordered tuple containing the property of being an angle, whereas equilaterality can be analysed in terms of an ordered tuple containing the property of being a length: since the unstructured properties of being an angle and being a length are distinct, so are the structured properties of being equiangular and equilateral and structured states of affairs constituted by ordered tuples of objects and those properties (Lewis, 1986, 56-7).

Since non-particulars do not exist, non-particular states of affairs cannot be analysed as ordered n-tuples of non-particulars and properties. Instead, non-particular states of

affairs must be analysed as ordered n-tuples of properties and higher-order properties of properties (Soames, 1987, 224). The state of affairs of something's grazing, for example, can be analysed as the ordered pair of the property of being a horse, and the higher-order property of being instantiated. The state of affairs of a horse's grazing can be analysed as the ordered triple of the property of being a horse, the property of grazing, the higher-order relation of being co-instantiated, and so on.

Depictions of non-existents are also problematic for analysing depictive content in terms of structured states of affairs. If Holmes does not exist for example, then the content of a depiction of Holmes smoking cannot be analysed as the ordered pair of Holmes and smoking, because there is no such ordered pair. In general, depictions of non-existents cannot be analysed in terms of ordered tuples of non-existent objects and properties, because there are no ordered tuples of non-existent objects and properties. The analysis of depictive contents as structured states of affairs cannot distinguish between depictions of different non-existents with the same properties.

The solution is to combine structured states of affairs with the two-dimensional solution to the problem of depicting a posteriori impossibilities, by redefining the two-dimensional intension of a picture as a function which takes each (centred) possible world to the ordered tuple of objects and properties the picture would represents if that possible world were actual (Chalmers, forthcoming). So the two-dimensional intension of a depiction of Holmes' smoking, for example, is a function which takes counterfactual possible worlds to ordered pairs of detectives called 'Holmes' and the property of smoking, but the actual possible world, at which no such detective exists, to the ordered pair of the empty set and the property of smoking.

VII

The application of possible world semantics to the contents of depiction requires revision to cope with depictions in perspective and depictions of metaphysical and logical impossibilities, but the revisions that are required are close to the spirit of the possible worlds framework and consonant with the platitude that depiction is mediated by resemblance. The success of these revisions in defending the application of possible world semantics to depiction supports the continued pursuit of those

strategies for resolving the similar problems which arise for the analysis of the contents of thought, language and fiction in terms of possible worlds, rather than revisions which depart more radically from the spirit of the possible worlds framework.

Whatever revisions need to be made – even if they depart markedly from the analyses discussed in this paper – the examples discussed here suggest that most plausible analyses of depictive content will be consonant with the platitude that depictive representation is mediated by resemblance. The reason is that whatever complications are introduced into the analysis of depicted states of affairs, similar complications will need to be made to the analysis of properties, so that depictive will always resemble depicted states of affairs in respect of both being states of affairs of thing's having certain properties. Whatever theory of depictive content is right, that theory seems likely to support the platitude that depiction is mediated by resemblance.

Similarly, whatever revisions need to be made – even if they depart markedly from the analyses discussed in this paper – the examples discussed here suggest a strong analogy between the content of depictive and other kinds of representation. The reason is that whatever complications are introduced into the analysis of depictive content, analogous complications will need to be made to the analysis of linguistic, mental and other kinds of representation. The few disanalogies – such as the correlation between the structure and content of linguistic representation and the inability to depict impossibilities explicitly – discovered in this paper were either incidental or arose from the platitude that depiction is mediated by resemblance.

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