Depictive Structure?

Abstract: This paper argues against definitions of depiction in terms of the syntactic and semantic properties of symbol systems. In particular, it's argued that John Kulvicki's definition of depictive symbol systems in terms of relative repleteness, semantic richness, syntactic sensitivity and transparency is susceptible to similar counterexamples as Nelson Goodman's in terms of syntactic density, semantic density and relative repleteness. The general moral drawn is that defining depiction requires attention not merely to descriptive questions about syntax and semantics, but also to foundational questions about what makes it the case that depictions have the syntactic and semantic properties they do.

I. Introduction

There are two kinds of philosophy of language, which address two different kinds of question. The first kind is descriptive: it answers questions about what kinds of syntax and semantics our languages have. Answers to these descriptive questions include, for example, the thesis that the semantic value of a name is its referent and the thesis that the meaning of a sentence depends on the meaning of its parts. The second kind is foundational: it answers questions about what makes it the case that our languages have the syntax and semantics that they do. Answers to these foundational questions include, for example, the causal theory of reference and the thesis that language is mediated by convention (Lewis, 1969, 204; Stalnaker, 1984, 32-35; 1997, 166-168).

Correspondingly, there are two kinds of question about the nature of depiction: descriptive questions about the syntax and semantics of pictures and foundational questions about what makes it the case that depictions have the syntax and semantics they do. The descriptive questions include, for example, the questions of whether or not the semantics of depiction is compositional and of whether depictive representation is analogue or digital. The foundational questions include, for example, the issue of whether depiction is mediated by resemblance or whether it is instead mediated by convention or

causation. This paper argues against purely descriptive – syntactic and semantic – definitions of depiction.

According to the platitude that depiction is mediated by resemblance the difference between depiction and other kinds of representation is a foundational issue about what makes it the case that depictions represent what they do. An important alternative – argued originally by Nelson Goodman (1968) and recently by John Kulvicki (2003; 2006) – is that the difference between depiction and other kinds of representation is a descriptive issue concerning the syntactic and semantic properties of symbol systems. As Goodman writes: '...whether a denoting symbol is representational [depictive] depends not upon whether it resembles what it denotes but upon its own relationships to other symbols in a given system' (1968, 226).

Goodman proposed that three properties are necessary and jointly sufficient for a symbol system to be depictive: syntactic density, semantic density and relative repleteness. The first part of the paper explains the nature of symbol systems and these properties of them, and argues that they are neither individually necessary nor jointly sufficient for a symbol system to be depictive. Goodman's definition was highly counterintuitive. As he himself wrote: 'This all adds up to open heresy. … Pictures may function as representations within systems very different from the one we happen to consider normal; colors may stand for their complementaries or for sizes, perspective may be reversed or otherwise transformed, and so on.' (Goodman, 1968, 230-231).

Although the problems with Goodman's proposal are familiar, understanding them is a preliminary requirement of understanding John Kulvicki's (2006) more sophisticated structural definition of depiction, which shows how the excesses of Goodman's position can be avoided while retaining the spirit of his approach. In particular, Kulvicki (2006, 41) proposes that the conditions of relative repleteness, syntactic sensitivity, semantic richness and transparency are jointly necessary and sufficient for depiction. Although it resolves many of Goodman's problems, I will argue in the second part of the paper that

Kulvicki's definition still fails to overcome the underlying problems of Goodman's definition, because it still fails to provide sufficient conditions for depiction.

The project of defining depiction syntactically and semantically may be difficult to implement in detail, but this will not convince many of the impossibility of implementing it in principle. Though I can offer no proof of it's impossibility, I will close by outlining some more principled objections to the project: I will argue that definitions of depiction in terms of syntactic and semantic properties of symbol systems overlook an important distinction between symbol systems in the abstract and symbol systems in use. Merely descriptive definitions of depiction, I will argue, are necessarily incomplete without an account of what makes a symbol system in the abstract a symbol system in use or, in other words, a foundational theory of depiction.

II. Syntactic and Semantic Density

A symbol system, according to Goodman's definition, is a set of characters correlated with a set of extensions (1968, 143). In the symbol system of Arabic numerals, for example, the characters are the numerals '1', '2', '3', '4', … and so on and the extensions are the numbers 1, 2, 3, 4, … and so on. The symbol system correlates '1' with 1, '2' with 2, '3' with 3, '4' with 4, … and so on. According to Goodman, alphabets, languages, notations, musical scores and various kinds of depiction are all symbol systems. Different kinds of symbol system are distinguished by differences in their syntactic and semantic properties; depictive symbol systems are supposed to be distinguished by syntactic density, semantic density and relative repleteness.

The first condition Goodman proposes is necessary for a symbol system to be depictive is syntactic density. A symbol system is syntactically dense, according to Goodman's definition, if and only if it has '…an infinite number of characters so ordered that between each two there is a third' (1968, 163). So, for example, the symbol system of an analogue clock is syntactically dense because between every two positions of its minute hand, which are the characters of the clock's symbol system, there is a third intermediate

position: the position of the clock's hand at 90.5°, for example, is a character between the positions of its hands at 90° and 91° (See Walton (1971) for this example).

Semantic density – the second condition Goodman proposes is necessary for depiction – is like syntactic density, except it applies to the extensions rather than the characters of symbol systems. A symbol system is semantically dense, according to Goodman's definition, if and only if there is 'an infinite number of compliance-classes [extensions] so ordered that between each two there is a third…' (1968, 153). So, for example, the symbol system of a clock is dense because between every pair of times, which are the extensions of the symbol system, there is a third intermediate time: three o'clock, for example, is between six o'clock and twelve o'clock.

There is a lacuna in these definitions as stated, since Goodman fails to specify which ordering of the characters of a symbol system is relevant to whether it is dense (Bach, 1970, 130). In the mathematical sense, any arrangement of the members of a set count as an ordering of that set. The set with members a, b and c, for example, has six orderings: abc, acb, bac, bca, cab and cba. This holds no matter how arbitrary the arrangement or ordering and regardless of whether it is capable of being written down. Although numbers, for example, are naturally given in ascending order beginning with $1, 2, 3, 4, …$ and so on, any other arrangement, no matter how unnatural, also counts as an ordering of the numbers.

In the second edition of *Languages of Art*, Goodman addresses this problem by writing that '…the ordering in question is understood to be such that any element lying between two others is less discriminable from each of them than they are from each other.' (1976, 136). So, for example, 'b' is not ordered between 'a' and 'c' in the relevant sense because 'b' is not less discriminable from 'a' and 'c' than 'a' and 'c' are from each other. The position of the clock's hand at 90.5°, however, is between 90° and 91°, since it is easier to distinguish 90° and 91° from each other than it is to distinguish either from 90.5°. And half past twelve is between twelve and one o'clock, because it's less discriminable from both of them than they are from each other.

Syntactic density is not a necessary condition for a symbol system to be depictive. Chess diagrams, for example, are not syntactically dense because there are only a finite number of characters in the system. The number of diagrams is limited by the fact that there is a maximum – excluding diagrams representing impossible positions – of thirty-two figurines which may occupy only sixty-four squares. Although large, the number of characters in the symbol system is not infinite, and so there is not an infinite number of characters so ordered – let alone ordered in the sense relevant for syntactic density – such that there is a third character between every pair of characters in the symbol system.

Moreover, chess diagrams are not syntactically dense because there are some pairs of diagrams such that no diagram is less discriminable from either of them than they are from each other. Even if it's conceded, for example, that the diagram of the position in which white's king's pawn is advanced one square is less discriminable from both the diagram of the opening position and the diagram of the position in which white's king's pawn is advanced two squares than they are from each other, there's no diagram which is less discriminable from both the diagram of the opening position and the diagram of the position in which white's king's pawn is advanced one square than they are from each other, since there are no diagrams in which figurines are between squares.

Likewise, the symbol system of chess diagrams shows semantic density is not a necessary condition for a symbol system to be depictive. The symbol system of chess diagrams is not semantically dense because its extensions are positions of the pieces on the board, of which there is only a finite number and because since an arrangement in which a piece overlaps two squares does not count as a position in the game, there are some positions such that no position is less discriminable from either of them than they are from each other. There's no position, for example, which is less discriminable from the opening position and the position in which white's king's pawn is advanced one square than they are from each other, since there are no positions in which pieces are between squares.

The same underlying point can be made with other examples. Bach (1970, 126), for example, makes a similar point with the example of '…a scheme in which each picture is composed of circular dots at a limited number of permissible places such that they do not overlap, and [such] that each dot is of one of a finite number of distinct colours and sizes.' However, Bach concedes that this example is not compelling because it does not correspond to any symbol system actually in use. Similarly, Kulvicki (2006, 26) suggests that digital photography is a counterexample to syntactic and semantic density, since the pixels in digital photographs cannot occupy positions between adjacent pixels, just as the figurines in chess diagrams cannot occupy positions between adjacent squares.

III. Relative Repleteness

Relative repleteness is the third condition that Goodman holds is individually necessary and jointly sufficient with syntactic and semantic density for a symbol system to be depictive. One symbol system is less replete relative to another, according to Goodman's definition, if and only if '...the character constitutive aspects under the first are properly included among the character constitutive aspects of the second' (Goodman, 1968, 230). Euler diagrams illustrating only the overlap of sets, for example, are less replete than similar diagrams used to illustrate both overlap and size of sets, because the relative size of an inscription's circles is irrelevant to which Euler diagram it inscribes but highly relevant to the diagram it inscribes in the system which represents both overlap and size.

Three clarifications. First, characters, according to Goodman's definition, are sets of inscriptions, where inscriptions are just representational noises, sounds, marks and so on (1968, 131). So, for example, in the symbol system of the alphabet, the letters are defined as the set of their inscriptions: 'a' is the set of inscriptions of 'a', 'b' the set of inscriptions of 'b', 'c' the set of inscriptions of 'c' and so on. So the character constitutive aspects of a symbol system are the features of inscriptions which are relevant to whether they are a member of a set which constitutes a character in that system. Shape, for example, is a character constitutive aspect of the alphabet, because the shape of an inscription is relevant to whether or not it is a member of a set which constitutes a letter.

Second, symbol systems cannot be relatively replete simpliciter, but only replete relative to other symbol systems. Black and white photography, for example, is replete relative to line drawing but not relative to colour photography, because shading is relevant to which photographs but not which line drawings are inscribed and colour is relevant to which colour photographs but not which black and white photographs are inscribed. So being depictive, according to Goodman, is a matter of degree: a syntactically and semantically dense symbol system is more depictive than another if and only if the former is replete relative to the latter. As he writes, 'A simple graphic diagram and a full-blown portrait differ from each other in degree but contrast sharply with a description' (1968, 231).

Third, relative repleteness, as Goodman defines it, is not necessary for a symbol system to be more depictive than another, since, in contrast with his intentions, symbol systems neither of which include all of the other's character constitutive aspects are classified as equally replete (Kulvicki, 2006, 22). A symbol system which employs both red and blue shapes, for example, should be more replete than a symbol system which employs only green shapes, since more properties matter to what is represented by the characters of the former. But since red and blue are character constitutive aspects of only the former and green is a character constitutive aspect of only the latter, neither's character constitutive aspects includes the other's.

Kulvicki suggests an alternative definition of relative repleteness to address this problem. One symbol system is more replete than another, according to Kulvicki's (2006, 33) definition, if and only if they have syntactically relevant properties in common and the former has more syntactically relevant properties not in common with the latter than the latter with the former. So the system which employs red and blue shapes, for example, is more replete than the system which employs only green shapes, since shape is relevant in both and the former has more syntactically relevant properties not in common with the latter – red and blue – than the latter with the former – just green.

Syntactically relevant properties, according to Kulvicki's definition, are the properties of inscriptions upon which character membership supervenes or, in other words, the properties which must be changed in order for which character an inscription inscribes to change. Shape and orientation are syntactically relevant properties of the alphabet, for example, because which letter an inscription inscribes supervenes on its shape and orientation. No change in which letter an inscription inscribes is possible without a change in either the inscription's shape, orientation or both: a 'b' cannot become a 'q' unless its orientation changes and an 'o' cannot become an 'x' unless its shape does.

But relative repleteness even as defined by Kulvicki is not necessary for a symbol system to be more depictive than another either. Compare, for example, chess diagrams – which are depictive – with the algebraic system for recording chess positions – which is not depictive, or less depictive. Syntactic identity in the diagrammatic system supervenes on the colour of figurines and their position on sixty-four squares, whereas syntactic identity of characters in the algebraic system supervenes on the colour of figurines and their position adjacent to sixty-four coordinates. Since both systems have sixty-four properties not in common with the other, neither is replete relative to the other.

The same underlying point can be made with the example of digital pictures, which are less controversially depictive. Compare, for example, digital photography – which is depictive – with a coordinate system for recording the same information – which is not or less depictive. The syntactic identity of digital photographs supervenes on the colour of pixels and their position in the photograph, whereas syntactic identity in the coordinate system might supervene on the colour of pixels and their position adjacent to coordinates. Since both systems record the same information, the number of coordinates and positions in the photograph is the same, so neither system is replete relative to the other.

IV. Insufficiency of Goodman's Definition

The example of the analogue clock, which I used to illustrate the definitions of syntactic and semantic density, shows that syntactic and semantic density aren't sufficient for a

symbol system to be depictive. The clock is syntactically dense because it possesses an infinite number of characters so ordered that between each two is there a third: the position of the clock's hand at 90.5°, for example, is a character between the positions of 90° and 91°. Similarly, the clock is syntactically dense because it possesses an infinite number of extensions so ordered that between each two there is a third: twelve o'clock, for example, is between one o'clock and eleven o'clock. But the clock is not depictive.

An elaboration of the example of the clock shows that syntactic and semantic density are not even jointly sufficient with relative repleteness. Imagine a clock such that, as well as the direction of the hour hand representing the hour and the direction of the minute hand representing the minute, the thickness, colour, shape, length and other properties of the clock's hand represent the second, date, year and other properties of the time. The symbol system to which this complex clock belongs is much more replete than the symbol system to which an ordinary clock belongs, but the symbol system of the complex clock is not at all more depictive than the symbol system of the simple clock (Peacocke, 1987, 405).

Another counterexample to the sufficiency of Goodman's analysis is enthusiastically mentioned by Goodman himself, who writes that '…colours may stand for their complementaries or for sizes, perspective may be reversed or otherwise transformed, and so on.' (Goodman, 1968, 231). The system in which colours stand for their complements, for example, is syntactically and semantically dense because, regardless of whether the colours represent themselves or other colours, there are an infinite number of colours so ordered that between every pair there is a third. And the system has the same degree of repleteness as more ordinary systems of pictorial representation, since the same features – namely colour – are relevant to which character an inscription inscribes.

Richard Wollheim (1980) argues that although they meet the conditions of Goodman's analysis, examples of this kind – where what the colours or parts of a picture represent is systematically jumbled – are not depictive, and so counterexamples to the sufficiency of density and relative repleteness for depiction. Although jumbled up systems are extremely odd, I'm not convinced that they're not depictive, because their oddity seems

to me to consist in their being examples of less realistic depictive systems, rather than examples which are not depictive at all. But it's important to keep these examples in mind, because they play an important part in motivating Kulvicki's analysis of depiction (Kulvicki, 2006, 24-5), which is the focus of the following sections.

One response to the counterexamples to the necessity of Goodman's definition leads to a third problem with its sufficiency. Catherine Elgin and Goodman (1988, 123-31) have argued that although the symbol system of chess diagrams is neither dense nor replete, the symbol system of chess diagrams is included in the larger symbol system of depiction, which is dense and replete. The symbol system of chess diagrams, for example, is included by the symbol system of depiction in that its set of characters and its set of extensions are subsets of the set of characters and the set of extensions of the system of depiction as a whole; and this system is syntactically and semantically dense because those sets are ordered so that between every pair of members there is a third.

However, as Elgin and Goodman admit (1988, 128), all symbol systems are included by symbol systems which are syntactically and semantically dense and all syntactically and semantically dense symbol systems include symbol systems which are not syntactically and semantically dense. The symbol system of quotation in which letters represent themselves, for example, is not syntactically and semantically dense, but it is included in a symbol system of samples of handwriting, in which inscriptions represent their exact look and shape (Elgin and Goodman, 1988, 28). So interpreted in this way, semantic and syntactic density are trivial conditions: I will argue later that this kind of triviality reflects an underlying problem which recurs for most purely structural definitions of depiction.

V. Syntactic Sensitivity and Semantic Richness

In the last three sections I argued the three conditions proposed by Goodman – syntactic density, semantic density and relative repleteness – are neither individually necessary nor jointly sufficient for a symbol system to be depictive. In the next three sections I'll argue that, even though they overcome some of the problems for the necessity of Goodman's

three conditions, the four conditions proposed by Kulvicki (2006, 41) – relative repleteness, syntactic sensitivity, semantic richness and transparency – are not necessary or sufficient for depiction either. Finally, I will use a distinction between symbol systems in the abstract and symbol systems in use to argue that purely syntactic and semantic definitions of depiction of any kind cannot succeed.

Kulvicki suggests that semantic richness and syntactic sensitivity, instead of semantic and syntactic density, are necessary conditions of depiction. A symbol system is semantically rich, according to Kulvicki's definition, if and only if '...there are at least as many possible denotations [extensions] in the system as there are syntactic types [characters] in that system.' (Kulvicki, 2006, 38). The symbol system of Arabic numerals, for example, is semantically rich because there are at least as many numbers as there are numerals: every numeral represents a unique number. Similarly, the symbol system of chess diagrams is semantically rich, because the number of positions represented is the same as the number of diagrams – there's a unique position for every diagram.

Kulvicki (2006, 38-39) introduces the condition of semantic richness into his definition of depiction in order to exclude icons such as, for example, those used on computer desktops. Many different pictures of waste paper baskets, for example, all represent the same folder of deleted items and many different pictures of compact discs all represent the compact disc drive. Because relative repleteness and syntactic sensitivity only address syntactic aspects of symbol systems, they fail to register the semantic poverty of systems such as this. But because semantic richness addresses the extensions as well as the characters of symbol systems, it is able to exclude the symbol system of desktop icons on the basis of its semantic poverty.

I disagree with Kulvicki that desktop icons are not depictions, so I regard desktop icons as a counterexample to the necessity of semantic richness for a symbol system to be depictive. However, I'm also prepared to concede that this disagreement is not substantive. There is a difference between desktop icons and other kinds of depiction, and I agree with Kulvicki that this difference adheres in the fact that desktop icons are not

semantically rich, whereas most other kinds of depiction are semantically rich. Once this difference is recognised, the question of whether or not desktop icons should be classed with other kinds of depiction – unlike the questions raised below – is merely a matter for verbal stipulation, rather than substantive debate.

A symbol system is syntactically more sensitive than another, according to Kulvicki's definition, if and only if 'the changes in SRPs [syntactically relevant properties] sufficient for a change in syntactic identity in the latter are properly included among the changes in SRPs sufficient for a change in syntactic identity in the former' (2006, 35). Euler diagrams illustrating the overlap of sets, for example, are less sensitive than similar diagrams used to illustrate both overlap and size of sets, because the relative size of an inscription's circles is irrelevant to which Euler diagram it inscribes but highly relevant to which diagram it inscribes in the similar system used to represent both overlap and size.

Kulvicki argues that syntactic sensitivity is a necessary condition for a symbol system to be depictive. Take, for example, a picture containing a word. Any change in the syntactic identity of the word would result in a change in the syntactic identity of the picture, since it would cease to be a picture of that word. But some changes in the syntactic identity of the picture – such as changes in the font or size of the depicted word – would not change the syntactic identity of the word, since the picture would continue to depict the same word. So the syntactically relevant properties of the word are properly included in the syntactically relevant properties of the picture (Kulvicki, 2006, 34-5).

But syntactic sensitivity is not a necessary condition for a symbol system to be depictive. Compare, for example, the symbol system of chess diagrams with the symbol system of the alphabet. Neither symbol system's syntactically relevant properties includes the syntactically relevant properties of the other: whether an inscription is of the letter 'b', for example, can change without changing whether it inscribes a chess diagram, and vice versa. So the property of being an inscription of the letter 'b' is a syntactically relevant property of the alphabet, but not of chess diagrams. Likewise, the property of being an

inscription of the opening position's diagram is a syntactically relevant property of chess diagrams, but not the alphabet. Neither system is more sensitive than the other.

Since character inscription in both symbol systems supervenes on shape and orientation, it might be responded that the syntactically relevant properties of both symbol systems are shape and orientation, rather than properties like being an inscription of 'b' or being an inscription of the opening position's diagram. But this still does not make either one of the symbol systems more syntactically sensitive than the other, because in this case the syntactically relevant properties of both symbol systems are exactly the same, and so the syntactically relevant properties of neither symbol system are properly inclusive of the other's. On both construals it follows that the alphabet and chess diagrams are equally syntactically sensitive, but chess diagrams are depictive and the alphabet is not.

VI. Transparency

A symbol system is transparent, according to Kulvicki's definition, if and only if for every inscription of a character in the system which represents another inscription, the former inscription is of the same syntactic type as the latter (Kulvicki, 2006, 53). So, for example, photography is supposed to be transparent because, according to Kulvicki, photographs of photographs have the same syntactic properties as the photographs they are of. Just as a photograph of a snowfield is white, for example, a photograph of a photograph of a snowfield is also white. So photography, according to Kulvicki, is depictive because photographs are relatively replete, syntactically sensitive, semantically rich and transparent.

Kulvicki (2006, 64) concedes that, strictly speaking, not all depictive symbol systems are transparent. Blurry photographs of photographs, for example, are not always syntactically identical to the photographs they are of, since some of a photograph's syntactically relevant properties may be obscured or slightly changed by a blurry photograph of it. However, Kulvicki argues that although blurry photographs of photographs are not identical in their syntactically relevant properties with the photographs they are of, they

are still very similar in their syntactically relevant properties to the photographs they are of. So although Kulvicki concedes that transparency is not necessary for depiction, he still maintains that approximate transparency is.

A severer problem for the necessity of transparency is that many pictures of pictures don't share all the intuitively syntactically relevant properties of the pictures they are of: taking a photograph of a photograph at a forty-five degree angle, for example, distorts the width of shapes on the photograph's surface, in a way that intuitively results in a change to the photograph's syntactically relevant properties, and certainly in a change to what it represents. Kulvicki's response is to argue that there is a kind of 'bare bones' (2007, 59) content which both photographs share, and that the different surface properties of the two photographs are not syntactically relevant because they don't produce a difference in bare bones content.

The condition of transparency enables Kulvicki (2006, 61-2) to neatly exclude the examples of jumbled up symbol systems which purport to demonstrate the insufficiency of Goodman's definition. The symbol system in which colours represent their complements, for example, is not transparent, because representations of representations in that symbol system are not syntactically identical to the representations they are of: representations of red representations, for example, differ in their syntactic properties from red representations, because colour is syntactically relevant but representations of red representations are green whereas red representations are red.

VII. Insufficiency of Kulvicki's Definition

Transparency alone is not a sufficient condition for a symbol system to be depictive. Take, for example, a symbol system of quotation in which letters represent themselves, so that 'a' represents 'a', 'b' represents 'b', 'c' represents 'c' and so on. This symbol system is not depictive, but it is transparent: inscriptions of letters in the system are of the same syntactic type whenever one represents the other, since 'a' represents 'a' and 'a' is of the same syntactic type as 'a', 'b' represents 'b' and 'b' is of the same syntactic type as 'b'

and so on. Since the symbol system of using letters to represent themselves is transparent but not depictive, transparency is not a sufficient condition for depiction.

Nor is transparency jointly sufficient for depiction in combination with syntactic sensitivity. Compare, for example, the symbol system of German letters representing themselves and the symbol system of English letters representing themselves. Since 'β' is a letter in German but not a letter in English there is one additional property – the property of being an inscription of 'β' – relevant to syntactic identity in the symbol system of German letters representing themselves than in the symbol system of English letters representing themselves. So the system of German letters representing themselves is both transparent and syntactically more sensitive than the system of English letters representing themselves, but not depictive.

One clarification. It may not seem obvious that the property of being an inscription of 'β' is a syntactically relevant property of the symbol system of German letters representing themselves, but this follows directly from the reflexivity of supervenience and Kulvicki's characterization of syntactically relevant properties of a symbol system as the properties upon which being an inscription of a character in the symbol system supervenes: since the property of being an inscription of 'β' supervenes on itself or, in other words, since there can be no change in the property of being an inscription of 'β' without a change in the property of being an inscription of 'β', being an inscription of 'β' is a syntactically relevant property of the symbol system of German letters.

The symbol system of German letters representing themselves is also replete relative to the symbol system of English letters representing themselves, because they have syntactically relevant properties in common – the properties of being 'a', being 'b', being 'c' ... and so on – but the symbol system of German letters representing themselves has one more syntactically relevant property – the property of being 'β' – not in common with the symbol system of English letters representing themselves than the symbol system of English letters representing themselves has – none whatsoever – which are not in common with those of the symbol system of German letters representing themselves.

Finally, the symbol system of German letters representing themselves is semantically rich: since the characters and extensions of the system are identical, the system has exactly as many characters as extensions. So the symbol system of German letters representing themselves is transparent, syntactically sensitive, relatively replete and semantically rich but not depictive. It follows that transparency, syntactic sensitivity, relative repleteness and semantic richness are not jointly sufficient for a symbol system to be depictive. Since syntactic sensitivity and relative repleteness aren't necessary either, Kulvicki's definition, like Goodman's, does not provide necessary and sufficient conditions for a symbol system to be depictive.

Three objections. First, it might be argued that quotation is a kind of depiction (Davidson, 1979), in which case the symbol system of German letters resembling themselves is depictive, and not a counterexample to the sufficiency of Kulvicki's definition. However, even if this theory of quotation were accepted, it would follow not only that the symbol system of German letters representing themselves is depictive, but that it is more depictive, because more syntactically sensitive, than the symbol system of English letters representing themselves. But if the symbol systems of English and German letters representing themselves are depictive at all, then they are depictive to exactly the same degree: neither is more depictive than the other.

Second, it might be argued that since the symbol system of German letters representing themselves is only slightly more syntactically sensitive and relatively replete than the symbol system of English letters representing themselves, the former is more depictive than the latter, but only slightly. However, some alphabets are much more syntactically sensitive, but no more depictive. The International Phonetic alphabet, for example, has one hundred and seven letters, including the twenty-three letters of the Latin alphabet. So the symbol system of International Phonetic letters representing themselves is transparent and semantically rich as well as much more syntactically sensitive and relatively replete than the symbol system of Latin letters resembling themselves, but no more depictive.

Third, it might be objected that – strictly speaking – quotation requires quotation marks, but that a symbol system of quotes representing the letters they enclose is not transparent, since the quotations would have syntactically relevant properties – such as the property of containing quotation marks – which the expressions they quote do not. However, the use of quotation marks for quotation is not obligatory – quotation marks are not required for quotation. Furthermore, although quotations in quotation marks are not syntactically identical to the expressions they quote they are still syntactically similar, and Kulvicki admits – in order to accommodate blurry photographs – that only similarity and not identity of syntactically relevant properties is required.

Kulvicki's appeal to bare bones content in response to the example of a photograph of a photograph from a forty-five degree angle also raises an additional problem with the sufficiency of transparency. As Kulvicki writes 'There is, after all, a whiff of circularity here, and if not that, then at least a worry that the choice of SRPs is motivated only by the conclusion that is being sought. It is certainly intuitive to call pictures that share all determinate shapes and colors alike syntactically and, hence, semantically. But pictures that differ in the ways that they can under arbitrary perspective maps do not intuitively share content.' (2006, 56-7). The worry is that syntactically relevant properties can be chosen in such a way as to make nearly any symbol system transparent.

The system of colours representing their complements, for example, is not transparent. But if the bare bones content and the syntactically relevant properties of pictures in the system were disjunctive properties such as being blue or orange, being red or green and being yellow or purple, then the symbol system would be transparent: a purple picture of a yellow picture, for example, would be syntactically identical with the yellow picture it is of, since both would share the syntactically relevant property of being yellow or purple and the bare bones content of representing something yellow or purple (Kulvicki, 2006, 61-2). So whether a symbol system is transparent and thus depictive depends, according to Kulvicki, on the characterization of its syntactically relevant properties.

I do not want to argue here that Kulvicki's own choice of syntactically relevant properties

is arbitrary, but it does seem plausible that if it is non-arbitrary, part of what makes it so is not a purely descriptive question about the syntax and semantics of depiction, but a partly foundational question about why depictions have the syntax and semantics they do. This kind of problem seems to be a reoccurring one for purely descriptive definitions of depiction: varying which symbol systems or syntactic properties are under consideration can show that apparently substantive conditions can be trivially met. In the next section, I will suggest this is a symptom of a deeper problem for descriptive theories of depiction, which arises from their avoidance of foundational questions.

VIII. Symbol Systems

I have discussed six syntactic and semantic properties which are plausibly necessary, sufficient or jointly necessary and sufficient for a symbol system to be depictive. But neither syntactic density, semantic density, relative repleteness, semantic richness nor syntactic sensitivity are necessary for a symbol system to be depictive. Nor is syntactic density, semantic density and relative repleteness or relative repleteness, syntactic sensitivity, semantic richness and transparency jointly sufficient for a symbol system to be depictive. Despite their sometimes striking ingenuity, jointly necessary and sufficient conditions for depiction were not delivered by any of the syntactic and semantic conditions considered. Both Goodman's and Kulvicki's definition are unsuccessful.

But this does not show conclusively that a successful analysis cannot be supplied by similar syntactic or semantic properties. The conditions discussed in this paper are just some of the many possibilities that ingenuity may construct. Furthermore, it's open for proponents of structural definitions of depiction to argue that the examples I have given are misdescribed: it might be argued, for example, that the symbol system of chess diagrams is actually not depictive, or that symbol systems in which letters represent themselves actually are depictive. Worse, some of these disputes may be merely verbal. So although the arguments I have given so far may be successful in detail, they do not secure the conclusion that a descriptive definition of depiction is impossible in principle.

Nevertheless, I want to conclude by suggesting that no definition of depiction as a kind of symbol system can succeed, no matter what syntactic and semantic properties of symbol systems are specified. A symbol system, according to Goodman, is a set of characters correlated with a set of extensions or – in other words – a function from characters to extensions. A function is any mapping between two sets which delivers a single member of the second set for every member of the first: the function of doubling, for example, takes every member of the set of natural numbers to another member of that set: it takes 1 to 2, 2 to 4, 3 to 6, ... and so on. Every mapping between sets, no matter how arbitrary, is a function, so every arbitrary mapping from characters to extensions is a symbol system.

So there's a sense in which it's trivial that all depictions belong to symbol systems, since it's trivial that there are functions which take depictions to what they represent. And since there are typically many different functions which take a depiction to what it represents, there is a sense in which which syntactic and semantic properties a depiction has is also trivial, because each depiction will belong both to many symbol systems which have and many symbol systems which lack those syntactic and semantic properties. Although, for example, the symbol system of chess diagrams is not syntactically dense, chess diagrams belong to other symbol systems which are syntactically dense, because there are symbol systems which include additional characters between the diagrams.

Likewise, the symbol system of colours representing their complements is not transparent, but the characters of this symbol system also belong to another symbol system, in which being a colour or its complement represents the disjunctive property of being a colour or its complement, which is transparent. Although not every symbol system is transparent, every representation trivially belongs to the transparent symbol system characterized by the function which takes each representation to itself, so there's a sense in which every representation is transparent. And in general, because there are numerous different kinds of functions from characters to extensions, nearly all syntactic and semantic properties are liable to be possessed by a representation relative to some symbol system.

This problem may be avoided by distinguishing between symbol systems in the abstract –

functions from characters to extensions – and symbol systems in use – functions from characters to extensions which are used in communication (Lewis, 1975; Schiffer, 1993). Both the function from each English sentence to its meaning and the function from each English sentence to the meaning of its negation, for example, are symbol systems in the abstract, but only the former and not the latter is a symbol system in use, because only the function from English sentences to their meanings and not the function from English sentences to the meanings of their negations is actually used in communication.

Similarly, although the function from chess diagrams to what they represent is used in the illustration of chess positions, the function which takes the Mona Lisa to Socrates and Socrates' portrait to Lisa is not used for any kind of communication, so although both are symbol systems in the abstract, only the former and not the latter is a symbol system in use. And because only the former and not the latter symbol system is a symbol system in use, there's a sense in which the syntactic and semantic properties of the former system matter to whether or not the characters in that symbol system are depictions, whereas the syntactic and semantic properties of the latter system – no matter what semantic and syntactic properties they are – are irrelevant.

So distinguishing between symbol systems in the abstract and in use avoids the problem of purely syntactic and semantic conditions being trivially met, because although every character belongs to some syntactically dense, semantically dense and relatively replete symbol system in the abstract, not every character belongs to a dense and replete symbol system in use. Chess diagrams, for example, belong to a symbol system in use which is neither syntactically nor semantically dense, but belong only to symbol systems in the abstract which are syntactically and semantically dense. A definition of depiction should characterise not only the syntactic and semantic properties of depictive symbol systems, but also the difference between symbol systems in the abstract and in use.

But which symbol systems in the abstract are symbol systems in use is not a descriptive question about the syntactic and semantic properties that symbol systems actually use, but a foundational question about what makes it the case that we use symbol systems

with certain syntactic and semantic properties rather than others. English, for example, is a symbol system in use rather than merely a symbol system in the abstract because we have a convention of speaking and writing in English: it is this convention which makes it the case that English, rather than some alternative, is our language. So even if depiction is to be defined as a kind of symbol system, as Goodman and Kulvicki propose, this definition still has to address foundational questions about the nature of representation.

It might be argued that proponents of structural definitions can meet this obligation merely by maintaining that which depictive symbol systems, like which languages, are used is mediated by convention (as in Bennett, 1971). This would preserve the claim that depictions differ from descriptions only in the descriptive syntactic and semantic properties of the symbol systems to which they belong, while avoiding the charge that they have failed to address foundational questions about what makes it the case that depictive symbol systems have the syntax and semantics they do. But the distinction between symbol systems in the abstract and symbol systems in use raises two further and more serious objections to structural definitions, which can't be side-stepped in this way.

Firstly, while it is trivial that all depictions belong to symbol systems in the abstract – it is trivial that there are functions from depictions to what they represent – it is false that all depictions belong to symbol systems in use – functions from characters to extensions which are used in communication. Although an improvised sketch, for example, trivially belongs to a symbol system in the abstract which takes it to what it represents, the Mona Lisa to Lisa and the world map to the world, this symbol system – and any other symbol system to which the improvised sketch belongs – is not a symbol system in use, because nobody uses this symbol system in communication. The fact that the Mona Lisa depicts Lisa is irrelevant to the fact that the improvised sketch depicts what it does.

Note that this counterexample cannot be avoiding by adding that which depictive symbol systems, like which languages, are used is mediated by convention because the example of an improvised sketch is also an example of depiction in the absence of convention: this is part of what makes such a sketch an improvisation. Nevertheless, the counterexample

might be avoided by arguing that since improvised sketches are used to represent what they do, it is trivially the case that the function from improvised sketches to what they represent is a symbol system in use, as well as in the abstract. In general, it might be argued that any function from representations to what they represent is a symbol system in use, as well as a symbol system in the abstract.

But although I'm willing to concede that a symbol system need not be conventional to be a symbol system in use, I'm not willing to concede that merely being a function from representations to what they represent is sufficient for a symbol system to be a symbol system in use. Take, for example, the function which takes Chinese sentences to what they represent in Chinese and English sentences to what they represent in English. If merely being a function from representations to what they represent is sufficient, then this function is a symbol system in use. But the gerrymandered nature of this function rightly suggests that it is merely a symbol system in the abstract, and not in use.

This point also undermines Goodman and Elgin's (1988, 129-31) suggestion that their conditions should be applied only to distinguishing the full pictorial symbol system – the function which takes every picture to what it represents – from the full linguistic system – the function which takes every sentence to what it means. This suggestion presupposes that the function which takes every picture to what it represents is a symbol system in use but, given the diversity of kinds of pictorial representation, this seems unlikely: the function which takes every picture to what it represents is as gerrymandered as that which takes Chinese sentences to what they represent in Chinese and English sentences to what they represent in English.

Secondly, just as whether or not a symbol system in the abstract is a symbol system in use depends on whether it's used in communication, whether or not a symbol system is depictive can vary according to how it is used. If the symbol system of chess diagrams, for example, were used by people who failed to notice the resemblance of the diagrams to the positions they illustrate or whatever other syntactic and semantic properties of the system are relevant, but instead used the diagrams as if they were unstructured words for

the various positions, then the symbol system would cease to be depictive without any change in its abstract syntactic and semantic properties. If this is possible, then whether a symbol system is depictive cannot be defined in syntactic and semantic terms alone.

Similarly, the symbol system of letters representing themselves isn't depictive because although all the characters in that symbol system resemble their extensions, it is not for this reason but because of precedent that this symbol system is preferred over others as a method of representing the letters. But if the symbol system of letters representing themselves was preferred because of their resemblance to themselves, it seems it would count as a depictive symbol system. So whether or not a symbol system is depictive does not depend purely on the abstract syntactic and semantic properties of the symbol system, but also on the way the system is used within a population: whether a symbol system is depictive cannot be defined in terms of its syntactic and semantic properties alone.

In terms of the distinction drawn at the beginning of this essay, questions about the nature of depiction are not descriptive questions about the syntax and semantics of pictures, but foundational questions about how depiction is mediated. As Kulvicki writes '…one appealing direction in which to proceed is to claim that facts about us … contribute to determining which representational systems are pictorial … After all, a merely structural analysis of representational systems must fail to take into account how and by whom such representational systems are used…' (Kulvicki, 2006, 42). From this perspective, the platitude that depiction is mediated by resemblance seems a much better starting point than syntactic and semantic properties for the project of defining depiction.[1]

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