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Street Signs and Ikea Instruction Sheets: Pragmatics and Pictorial Communication

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Abstract A classical objection to pictorial communication is that pictures are intrinsically ambiguous and a picture, per se, can communicate an indeterminate number of different contents. The standard interpretation of this objection is that pictures are subordinate to language and that pictorial communication is parasitic on verbal communication. We argue that in many cases verbal communication presents a similar indeterminacy, which is resolved by resorting to pragmatic mechanisms. In this spirit, we propose a pragmatic approach which explains pictorial communication in terms of implicatures in a wide sense.

1 Introduction

A classical objection to the possibility of pictorial communication is that pictures are intrinsically ambiguous and a picture, per se, can be used to convey an indeterminate number of different contents. The standard interpretation of this objection is that pictures are subordinate to language and that pictorial communication is parasitic on verbal communication. In this paper we argue that in many cases verbal communication presents a similar indeterminacy, which is resolved by resorting to pragmatic mechanisms. In this spirit, we propose a pragmatic approach which explains pictorial communication in terms of implicatures.

In section 1 we present the traditional, Wittgensteinian objection to pictorial communication. Then we argue that pictorial communication does not differ from many examples of verbal communication, and pose the problem within the framework of a pragmatic approach. In section 2 we consider Ikea instruction sheets in order to investigate the role of Gricean conversational maxims and implicature generation in pictorial communication. A short conclusion follows. [1]

[1]We wish to thank Claudia Bianchi for reading and discussing an earlier version of this paper.

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2 Pictorial Communication

A classical objection to the possibility of communicating through pictures is well summarized by a philosophical dialogue included in *Insurmountable Simplicities* by Roberto Casati and Achille Varzi (2006). In this dialogue, a travel agent tries to convince a customer that all her problems with exotic and unknown languages could be solved with the aid of a *Traveler's Pictionary*, a small book of pictures representing all those objects and situations that might arise in a conversation during a trip abroad.

For example, the Pictionary includes figures of various kinds of bicycles, which could be useful to the traveler who wants to buy or rent one. In order to communicate, the agent says, it should be sufficient to choose the correct picture, and to show it to the interlocutor. At this point (as usual in all Varzi and Casati's dialogues) a third character, the meddler, intervenes in the conversation, and casts doubts on the effectiveness of this way of communicating: "Suppose you show me the picture with the right bicycle. […] How am I supposed to interpret your gesture? That you want to buy a bicycle like that? That you want to sell one? That you left your bicycle in the garage and now you want it back? Maybe you just remembered that your daughter has a bicycle like that one and you would like to share this memory with me … Or perhaps you meant to say: 'Look at this nice book of mine, it even has a picture of a bike!' I repeat: What happens after you have shown the picture with the right bicycle?". Again, let us suppose that "[a]long comes a tourist from Siberia who shows you the picture for 'buying' (and let us suppose we understand it is not the picture for 'selling'). Then she shows you the picture for 'bicycle.' What do you make of that? Perhaps the tourist intends to buy a bicycle, but perhaps she wants you to buy one. After all, she would have to use the same pictures in both cases, wouldn't she? And there are thousands of other possibilities. Perhaps she just wants to buy a picture of a bicycle (or she wants you to buy one). Or perhaps she is trying to tell you *not* to buy a bicycle because she thinks it could be dangerous".

In recent years, pictures and pictorial representations have received a great deal of attention in such fields as philosophy, psychology, artificial intelligence and cognitive science in general.[2] This paper is devoted to interpreting and discussing a specific philosophical argument concerning the possibilities and the conditions necessary for pictorial communication, which is well summed up in the above dialogue. This dialogue expounds a theme that recurs in the writings of the "second Wittgenstein". For example, in §23 of *Philosophical Investigations* (Wittgenstein 1953) the following observation is reported: "Imagine a picture representing a boxer in a particular stance. Now, this picture can be used to tell someone how he should stand, should hold himself; or how he should not hold himself; or how a particular man did stand in such-and-such a place; and so on".

[2] For some samples of the ample, (more or less) recent literature on these topics consider Abell and Bantinaki 2010; Albertazzi 2006; Anderson *et al*. 2002; Kulvicki 2006 and 2014, Tversky 2005 and the proceedings of the various editions of *The International Conference on the Theory and Application of Diagrams* (http://diagrams-conference.org/).

Of course, the meddler (and Wittgenstein) is right. However, it is also true that we use pictures to communicate[3] on many occasions and the problems pointed out by the meddler are unlikely to arise in practice: when we see the depiction of a bike, we usually have no trouble in understanding whether it means, for example, "bicycles on sale", "cycle lane" or "look, what a nice picture of my bike!" How can this happen? How is pictorial communication possible?

In pictorial communication, a sender uses pictures to intentionally communicate a certain content to a receiver. The task of the receiver is to reconstruct the communicative intentions of the sender by interpreting the pictures that the latter shows her. But the Pictionary examples show that, in order to understand the conveyed message, it is not sufficient to figure out what an image depicts (this constitutes, in synthesis, the "Wittgensteinian" objection of the meddler).

Some semiotic approaches have tried to explain pictorial communication in analogy with linguistic communication (where linguistic communication is accounted for in terms of the so-called "code-model" – see Sperber and Wilson 1986/1995, sect. 1.1): they have attempted to identify a more or less metaphoric articulation of pictures in symbols, whose meaning is then conceived as a sort of a code-message pairing. Consider, for example, the renowned analysis of the photographic picture in a pasta advertisement proposed by Roland Barthes (Barthes 1964). He identifies a number of "signs", that are analyzed in terms of a "signifier" (*signifiant*) and of a "signified" (*signifié*). So, for example, the signifier *tomato and pepper* (together with the red, green and white shades of color that are dominant in the picture) is associated with the signified *italianity*, the signifier *open bag* is associated with the signified *return from the market*. And so on.

Likewise, in this paper we will analyze pictorial communication in analogy with linguistic communication, but following a profoundly different path: we propose a *pragmatic* approach according to which, given for example the picture of a bicycle, the fact that it is used to communicate "bicycles on sale" rather than "cycle lane" is explained in terms of implicatures. An implicature is information that the speaker intends to communicate and that can be inferred from a certain utterance, but which is neither explicitly stated in it nor logically entailed by it. Our claim is that the notion of implicature can be extended to pictures. The picture of a bike explicitly represents a bike,[4] and, depending on the context, it could be used to implicate "bicycles on sale" or "cycle lane", etc.

The pragmatic theory developed by Paul Grice (1975) aims to explain how a receiver understands what the utterance of a speaker *means* in a given context, beyond what her words explicitly *say* in virtue of their literal meaning. For example, in certain contexts the sentence *I am very tired* could be uttered to communicate the message *I'd prefer not to go out tonight*, even if this content has little to do with the literal meaning of the uttered

[3] In most such cases, pictures are accompanied by words, or communication (partially) rests on some form of convention, which in turn has been achieved through language. However, cases of purely pictorial communication are conceivable. Consider for example the picture of a bike used to communicate "bicycles on sale here". Or, as a somewhat more anomalous example, consider a silent film without intertitles. Here too we are dealing exclusively with images (albeit *moving* images). And such a film could surely be used to communicate some message (to tell a story, for example - although not *every* story, of course). (For an interesting approach to cinematographic communication in line with our proposal, see Donati 2006.)

[4] Here we take it for granted that the picture of a bicycle represents a bicycle, and we do not consider the problem of explaining how this can happen, nor do we commit ourselves to a particular notion or theory of iconicity. In other words, here we do not take into account the problem of explaining iconic depiction, but we simply assume that pictures iconically represent certain objects or certain states of affairs.

sentence. Grice starts from the assumption that, in communicative interactions, a relation of rational cooperation is established between the sender and the receiver in order to achieve successful communication. According to Grice, such a rational cooperation relation can be spelled out in terms of the four well known *Gricean conversational maxims*, which will be presented in section 2 below. These maxims reflect the rational expectations of an agent concerning the communicative moves of her interlocutor.

In this perspective, communication is not reduced to the coding and decoding of messages. The interaction between a sender and a receiver is a much more complex phenomenon, and involves articulated inferential processes. In particular, according to Grice's inferential approach to communication:

1) the sender produces a clue of what she intends to communicate; this clue can be verbal (the utterance of a sentence, or, more in general, of a linguistic expression), or non verbal (a gesture, a facial expression, a silent pause, a picture), or a combination of both.
2) on the basis of this clue, of her previous knowledge and of the context, the receiver infers what the sender means.

So, sentences do not *encode* (complete) meanings; rather, they are complex clues of the meaning that the sender intends to communicate.

Grice proposed his theory to account for verbal communication. However, we shall argue that this approach is not limited to verbal language; it can also be applied to other forms of communication (and, in particular, to pictures). In Gricean terms, in the case of linguistic communication we can distinguish between an "utterance meaning" (the explicit meaning of the uttered sentence) and a "speaker meaning" (the meaning that the speaker intends to communicate with that utterance). Something similar happens with pictures. In the case of pictures, the "utterance meaning" is intrinsically incomplete (as is stressed by the meddler's objection). But when a picture is used to communicate in a specific context, the receiver inferentially completes its meaning on the basis of the context and of various hypotheses concerning the intentions of the sender.

In this section of the paper we adopt a rather general notion of implicature, which is compatible with various (either neo- or post-Gricean) approaches to pragmatics, such as, for example, Sperber and Wilson's theory of relevance (Sperber and Wilson 1986/1995; Carston 1988 and 2004).[5] In the next section we shall propose an analysis of

[5] Here a clarification is appropriate. It could be objected that (at least some of) the examples of pictorial communication described in this paper should not be considered implicatures in the strict sense, because they are more akin to other pragmatic phenomena, such as *implicitures* (Bach 1994; 2006) or *explicatures* (Carston 1988, 2004). In the last few decades the Gricean notion of implicature has been reconsidered by many researchers and various, more fine-grained, intermediate distinctions have been proposed, lying between explicit meaning and implicatures in the strict sense. According to Kent Bach, for example, an *impliciture* is a completion of what is explicitly said (e.g. when somebody says that *Some cats are black* to communicate that some *but not all* cats are black); Bach reserves the use of the term implicature only to those cases in which what is implicated is completely separate from what is said (e.g. when I say that *I am very tired* to communicate that I'd prefer not go out for dinner tonight). However, the situation is still controversial and, although various proposals have been made, a univocal and definitive view has not yet emerged (see e.g. Jaszczolt 2010; Davis 2010). Therefore, since this aspect is not essential for our current concerns, we prefer to stick with the original, rather general notion of implicature. In any case, even admitting that in some cases we may use pictures to communicate through Bach's *implicitures* (rather than implicatures in the strict sense), this does not affect our main thesis, i.e. the pragmatic, "Gricean" (in a wide sense) nature of many aspects of pictorial communication.

some aspects of pictorial communication that more closely fits the original Gricean approach.

Note that, as in the case of linguistic expressions, there is no reason why a (more or less) "incomplete" expression (i.e. a phrase that does correspond to a complete sentence) cannot be used to convey some implicature (consider for example a pedlar's cry, which may be regarded as performing the same function as a shop sign). In a similar case, the hearer first figures out the literal meaning of the expression (not necessarily a proposition), then calculates its implicatures.

Of course, this does not amount to denying that conventional elements play an important role in pictorial communication. For example, let us consider street warning signs. It is evident that the shape of the danger warning signs (an equilateral triangle with a red border in Europe, a yellow diamond in the United States and in many other extra-European countries) is fully conventional. But, once it has been assumed that the triangle (or the diamond) conventionally means "danger …", "warning …", "pay attention to…", many things must still be explained in order to understand what a sign aims to communicate. Consider the examples in Figs. 1, 2 and 3.

They communicate very different messages. Figure 1 is used to convey *Danger: a train could hurt you* (i.e. *a train could be dangerous for you*), whilst Fig. 2 is assumed to mean *you could hurt children* (i.e. *you could be a danger for children*). Figure 3 does not mean *Danger, there are skidding cars* (or *you could be a danger for some skidding car*), but *Danger, your car could skid*. These differences are in no way explicit in what the signs communicate, so to speak, *literally*. Rather, these are inferences made by the receiver on the basis of contextual knowledge and shared assumptions. For example, we all share the assumption that, in "normal" contexts, trains are usually more dangerous to cars then vice versa. But one can imagine different contexts in which the same signs may be used to convey a different meaning. For example, in some context, the sign in Fig. 2 could be used to communicate *Warning, dangerous kids* (on these points, see the discussion of Figs. 4 and 5 below).

It could be objected that all the signs in Figs. 1, 2 and 3 are fully conventional: you learned them at driving school, and when you see them in the street, you already know how they must be interpreted, without the need for any inferential process. This is surely the case, but their interpretation should be possible even leaving aside their

Fig. 1 Warning sign: rail crossing without safety arm

Fig. 2 Warning sign: children crossing

conventional coding and without any explicit learning. Consider, for example, the signs in Figs. 4 and 5 (Colors Magazine 2009).

You have probably never encountered them before, and you did not learn them on the basis of some explicit convention. However, it can be supposed that you will interpret them "correctly" without any effort. What makes this interpretation possible is, once again, your knowledge of the world, according to which you know that it is usually tanks that are potentially dangerous for cars (and not vice versa), whilst generally cars are potentially dangerous for squirrels. Of course, there could be contexts in which the opposite is the case: imagine for example a military history museum packed with precious specimens of ancient tanks, or an area infested by fierce mutant squirrels. The fact that such signs as *Danger, tanks* or *Danger, squirrels* are ambiguous and that their interpretation depends on the context testifies against the hypothesis of image interpretation as a decoding process. Moreover, in the terms of Grice's theory, we could say that in such cases (part of) the content transmitted by a picture - e.g. *Danger, a tank could hurt you*; or *Danger, you could hurt a squirrel* - can be *cancelled*, i.e. it can be eliminated by changing the context. This complies with the hypothesis that pictorial communication is based on *implicatures* - see the following section below - since the possibility of being cancelled is a peculiar trait of (conversational) implicatures.

As a further example, consider danger signs used in building sites. They too are conventional and codified, but most of us have never explicitly learned them. However, it is plausible that, in "normal" contexts, we have no problem in "correctly" interpreting them: the "natural" interpretation of Fig. 6 is *Danger, falling objects could hurt you* (and not *Danger, your hammer could fall* or *Danger, don't damage falling objects*); Fig. 7 reasonably means *Danger, you could fall* (and not *Danger, watch out for falling humans*).[6]

In some respects, this may suggest that the meddler of Casati and Varzi's dialogue is right. Pictures are ambiguous, and each picture can be used to communicate an indeterminate number of different messages.[7] On the other hand, in real situations this

[6] Note that in the latter example an arrow also appears, i.e. a further conventional element that is very common in pictorial communication. We shall return to this in the following section.

[7] Note that *indeterminate* does not mean *unlimited*. Of course, a given picture cannot be used to communicate everything. And if we use a picture of a bike, then presumably we have the intention of communicating something concerning bikes. Rather, *indeterminate* here means that there is an open set of possible messages that can be conveyed, which is not fixed a priori, and which depends on contextual factors.

Fig. 3 Warning sign: slippery road

indeterminacy usually vanishes and the context allows us to easily pick up the "correct" interpretation. In §23 of *Philosophical Investigations* (Wittgenstein 1953) a passage can be found which is somehow analogous to the above mentioned example of the boxer's picture: "I see a picture; it represents an old man walking up a steep path leaning on a stick. How? Might it not have looked just the same if he had been sliding downhill in that position?" But here Wittgenstein points out: "Perhaps a Martian would describe the picture so. I do not need to explain why *we* do not describe it so" (ibid.). In other words: this picture is ambiguous, but its ambiguity disappears as it is situated within a certain context of shared assumptions and goals. This is exactly what happens in most cases of pictorial communication.

The standard interpretation of such Wittgensteinian remarks is that pictures are always subordinate to language, and pictorial communication is parasitic on verbal communication, in the sense that linguistic communication is assumed to be conceptually prior to pictorial communication, and pictorial communication is conceived as possible only if linguistic communication is already taken for granted (but see Nyíri 2006 for a different point of view). However, it is interesting to note that we often use words in exactly the same way as pictures are used in the above examples. Let us consider a further danger sign (Fig. 8), in which verbal language is used instead of pictures.

Fig. 4 An unconventional warning sign

Fig. 5 An unconventional warning sign

The Italian phrase *Attenzione alla testa* should be translated in English as *Watch your head* (or *Mind your head*). But unlike English, Italian does not specify the possessive adjective, i.e. it is not specified whose head must be minded.[8] (This fact is not idiosyncratic of Italian. Also in the Spanish *Cuidado con la cabeza* the possessive adjective is omitted. In French both *Attention à la tête* and *Attention à votre tête* can be accepted.) So, *Attenzione alla testa* is intrinsically ambiguous, and, in different contexts, can be interpreted in different ways. For example, Herodias could have said *Attenzione alla testa* to Salomè to mean *Pay attention not to drop* (*not to lose, not to impair* ...) *the head of St. John the Baptist*. Or, in French, the executioner Sanson could have said *Attention à la tête* to a careless sans-culotte in front of the scaffold, to mean *Watch out for the severed head of the former Louis XVI; pay attention that it does not hurt you.*[9]

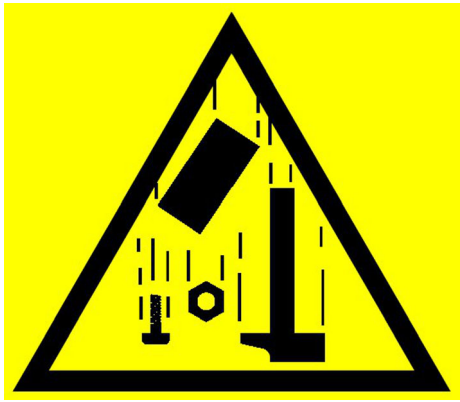
Of course, if compared to pictures, natural language allows a much more fine-grained specification of what is communicated at the level of explicit meaning (i.e. without resorting to pragmatic implicatures). Language can *say* many things that a picture cannot depict. This is the case of logical vocabulary. A picture cannot *represent*, for example, disjunctions, implications or universal quantification, whereas of course language can. In such cases, pictures can resort only to pragmatic mechanisms.[10] Consider implication, for example. The traffic sign in Fig. 9 intends to communicate

[8] The literal English translation of *Attenzione alla testa* should be *Mind the head*.

[9] Of course, the English phrase *Mind your head* also poses similar problems of ambiguity, due to the context sensitivity of the possessive *your*: what does "*your* head" mean? The head that is part of yourself? The one that you possess because you bought (or found, or severed) it? And so on. Indeed, possessive constructions are examples of context dependent expressions (Bianchi 1999), and this makes different interpretations possible, in analogy to the examples mentioned in the text.

[10] Or to conventional devices, such as, in the case of negation, crossed out pictures.

Fig. 6 A building site sign



that, *if* it rains, *then* the road is slippery. But this is not *said*; it *is implicated* by juxtaposing the two pictures.

Analogously, in Fig. 10 two pictures are juxtaposed to implicate that *if* the square button is pressed, *then* water flows from the tap.

But in linguistic communication we often do not feel the need for a fine-grained specification of explicit meaning. Consider again the sign in Fig. 8: *Attenzione alla testa* is a perfectly acceptable (and complete) expression in Italian; and, once situated in a specific context, we usually consider the message expressed by this sign as clear and satisfactory. So, in general, there are many linguistic utterances that are fully acceptable and effective, even if they present problems of "indeterminacy" similar to those of pictures.

Examples of such "indeterminacy" are contextual expressions, i.e. those linguistic expressions whose explicit meaning is incomplete: what they communicate partially depends on the context in which they are used (Bianchi 1999; Clark 1992). Compound nouns (Downing 1977; Green 1989) belong to this category. Compare the following examples: *greasy hair shampoo*, *long hair shampoo*, *dandruff shampoo*, *pet shampoo*, *lice shampoo*, *avocado shampoo*, *dog shampoo*. All these expressions have a similar structure. But the meaning they convey differs considerably and does not entirely

Fig. 7 A building site sign

Fig. 8 A verbal warning sign

depend in a compositional way on their syntactic structure and on the meaning of their components: usually, a greasy hair shampoo is a shampoo that stops your hair being greasy, but a long hair shampoo is not a shampoo that stops your hair being long; a pet shampoo is a shampoo for washing pets, but a lice shampoo is not a shampoo for washing lice; an avocado shampoo is a shampoo that smells of avocado, but a dog shampoo is not a shampoo that smells of dog. And so on. The analogy with the signs in Figs. 1, 2, 3, 4, 5, 6 and 7 is evident. It could be objected that the above noun examples are idiomatic (i.e. lexicalized and conventional) expressions. In some cases this is certainly true. But, in general, compound nouns are productive: they form a potentially infinite set, and we can always generate (and understand) new ones (Green 1989, p. 118). So, their understanding cannot always depend on explicit conventions: in the appropriate context we can easily (and correctly) understand compound nouns that we have never encountered before. This is analogous to the case of pictorial signs: surely some of them (such as the traffic signs in Figs. 1, 2 and 3) are fully conventional, but we can also easily understand unconventional signs, such as those in Figs. 4 and 5.

3 The Case of Ikea Instruction Sheets

Ikea instruction sheets offer an example of pictorial communication whose justification is presumably similar to that given by the ingenuous travel agent in Casati and Varzi's dialogue: Ikea furniture is sold all over the world to people speaking many different languages. So, the goal is to reduce linguistic communication to a minimum in order to minimize translation costs and problems.[11] Also in this case, of course, pictures are enriched with conventional elements (such as arrows and numbers - we shall return to this at the end of this section). However, they are good examples of various mechanisms operating in pictorial communication, and in particular of the idea that pictorial communication is based on implicatures. In this section we propose an analysis of some aspects of Ikea instruction sheets, based on the account of (conversational) implicature generation originally developed by Grice.

As already presented in the previous section, the Gricean *cooperative principle* is articulated in four *conversational maxims*, namely:

> *maxim of quantity* - give as much information as is needed, and no more; do not make your contribution more or less informative than is required;

[11] It should be noted that in *Philosophical Investigations* (Wittgenstein 1953), just before the already mentioned example of the boxer picture (§23), the activity of "[c]onstructing an object from a description (a drawing)" is counted among the examples of language games. Here Wittgenstein seems to equate drawings and (linguistic) descriptions; and language games (in the Wittgensteinian sense) seem to include pictorial communication, and not to specifically presuppose only forms of linguistic (i.e. verbal) communication.

Fig. 9 Warning: if it rains, then the road is slippery

maxim of quality - be truthful; do not give information that you believe to be false or that is not supported by adequate evidence;
maxim of relation - be relevant, say things that are pertinent to the conversation;
maxim of manner - be clear, brief, and as orderly as you can in what you say; avoid obscurity, ambiguity, repetitions.

Such maxims reflect the rational expectations of an agent involved in a communication: when a rational agent is communicating with somebody, she expects her interlocutor to respect the maxims. So, when the uttered message apparently does not respect some maxim, the receiver tries to make sense of it by reconstructing the

Fig. 10 If the button is pressed, then water flows

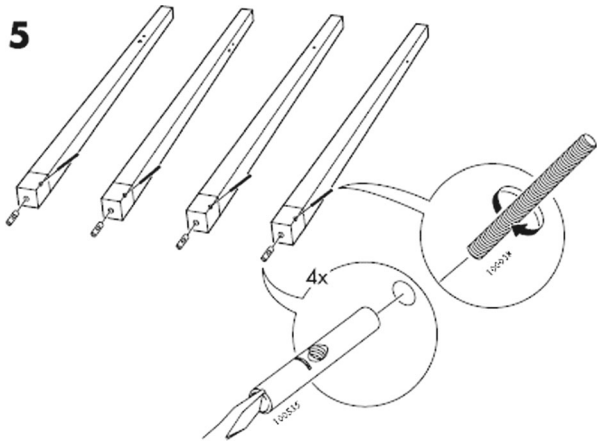


Fig. 11 An example of Ikea assembly instructions

intentions of the sender. This lies at the origin of a typical way of generating (conversational) implicatures: a sender can deliberately (and patently) violate some maxim, in order to implicitly communicate (i.e. to implicate) something that is not explicitly said in her message.

Analogously, if someone observing a picture assumes that it has been produced with a communicative purpose, then she automatically tries to make sense of its elements. If

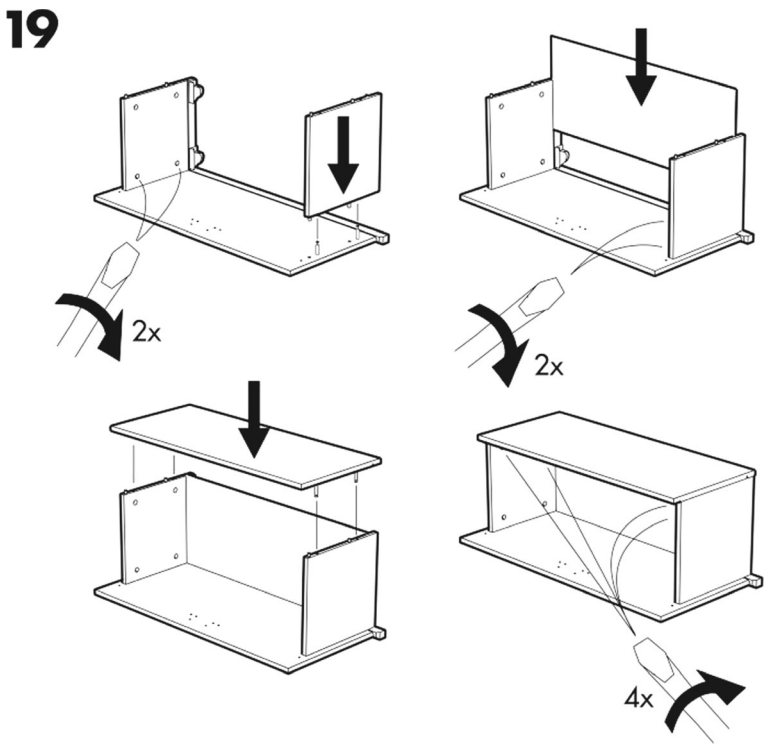


Fig. 12 An example of Ikea assembly instructions

something in the picture seems to violate the rules of a collaborative communication, then she tries to accommodate this apparent violation with the hypothesis that the sender has in any case the intention of communicating something.

Let us consider the case of repetitions. According to Grice's maxims, repetitions should be avoided (maxim of manner). Therefore, if an observer encounters the repetition of similar elements in a picture, then she assumes that there is a communicative purpose in this. There are different possibilities to this end. For example, (i) the picture could simply communicate that we are dealing with many different exemplars of the same type of object. Alternatively, (ii) we could be dealing with the same object depicted at different times (e.g. in different phases of an assembly process). Or (iii) it could indicate alternative states of the same object. Examples of all such possibilities can be found in Ikea assembly sheets.

Figure 11 is an example of case (i). Here there are four similar elements that must be interpreted as the four legs of the table to be assembled. (In some situations, the fact that there are many specimens of a given item is instead expressed in a conventional way; this is the case, for example, of the balloon with the "4x" label in the same picture or of the analogous balloons in Fig. 14).

Figures 12 and 13 are examples of case (ii). In Fig. 12 the four pictures show four different phases of the assembly of a shelf; analogously, the upper part of Fig. 13 shows

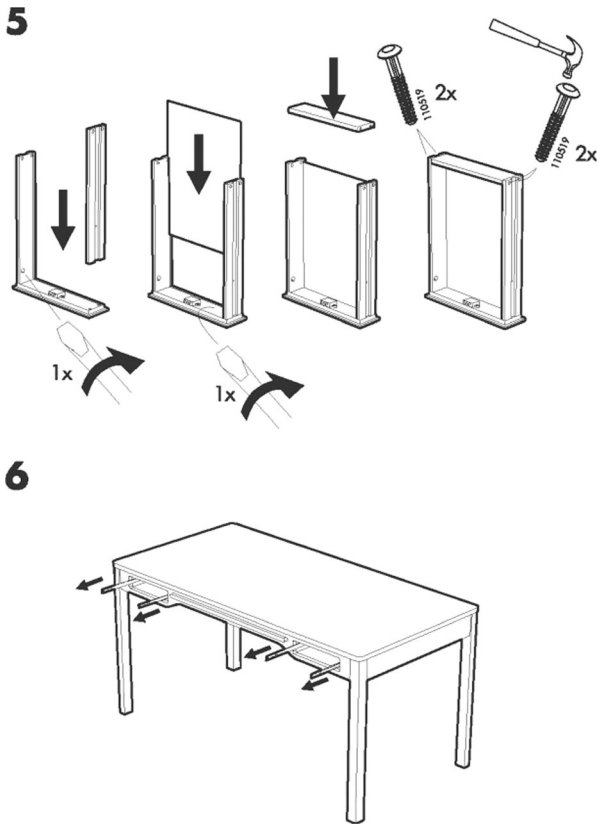


Fig. 13 An example of Ikea assembly instructions

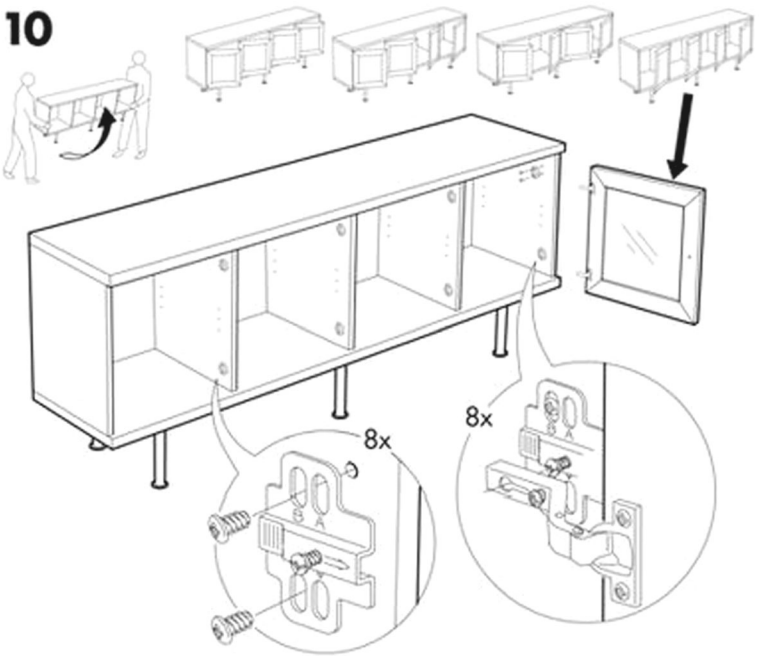


Fig. 14 An example of Ikea assembly instructions

four different moments of the assembly of a drawer. (This is by far the most widespread use of repetition in Ikea sheets - and, more in general, in assembly instruction pictures.)

Figure 14 exemplifies case (iii): here the four small pictures on the right of the upper part of the figure correspond to four alternative possibilities for assembling the cupboard doors.

It must be noted that in all the above examples there is no explicit or conventional mark that helps in distinguishing between such different interpretative possibilities. The correct interpretation is left entirely to the pragmatic inferences of the observer.

Other cases of apparent violation of conversational maxims can be found in assembly sheets. Consider for example the reciprocal dimensions of picture elements. The screws in the upper part of Fig. 13 are abnormally large if compared to the dimensions of the drawers. This can be considered as a violation of the maxim of quality: it is *false* that such huge screws are involved in the assembly process. But the observer easily infers that this is a way to show the shape of the screws in greater detail, in order to distinguish them from similar elements.[12] Analogous considerations hold for the reciprocal dimensions of the large cupboard in the center of Fig. 14 and the small pictures above it.

As already noted, in pictorial communication many conventional elements are often employed, such as arrows, crosses and numbers. But here too we do not have to deal with rigid conventions that associate a specific meaning to a particular pictorial element. In most cases, such "conventional" elements presuppose an inferential

[12] This is a paradigmatic example of a conflict between two competing conversational maxims: a truthful depiction of the screws in terms of their reciprocal dimensions with the drawer would entail omitting important details, thus violating the maxim of quantity.

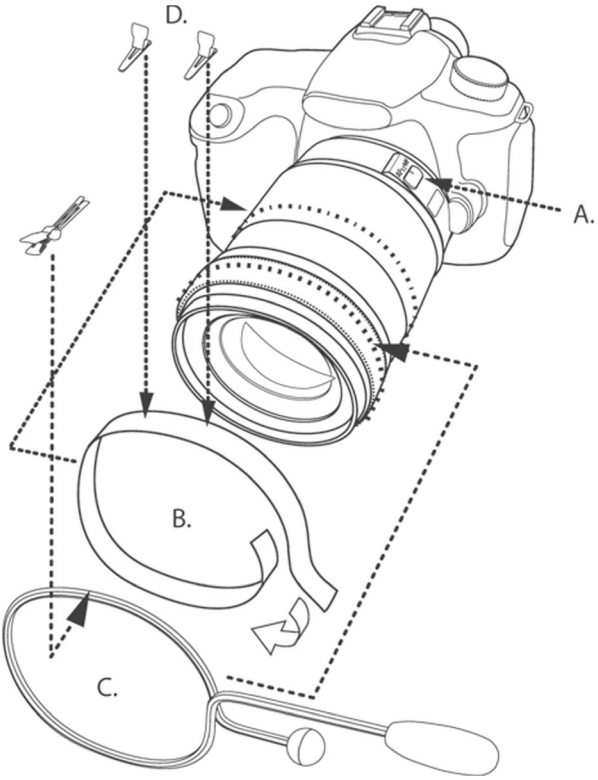


Fig. 15 The use of arrows in instruction sheets: an example

interpretation process on behalf of the receiver. By way of an example, let us consider arrows. Wittgenstein (1953, §454) remarks that "The arrow points only in the application that a living being makes of it". And arrows can point in many different ways. Consider for example Figs. 11, 12, 13 and 14. Here arrows are used to represent movement - they suggest how some element should be moved during the assembly process: the screwdriver must be rotated clockwise, the bottom of the drawer must be pushed down, and so on.

In Fig. 15 arrows are used to show the final position of the elements of the assembly. In other examples, arrows are employed to highlight some detail of the picture. In Fig. 16 they are used to associate numbers to the components to be assembled. Also in these cases, the correct interpretation is usually selected by the interpreter of the picture on the basis of pragmatic inferences without the help of any explicit convention.

4 Conclusions

In conclusion, it is certainly true that pictures are intrinsically ambiguous and that pictures, per se, can be used to convey an indeterminate number of different contents. But sentences, and in general, linguistic utterances, also often function as pictures in this respect: in such cases linguistic explicit meaning is incomplete, and it can be completed through recourse to pragmatic inferences. The same happens in pictorial

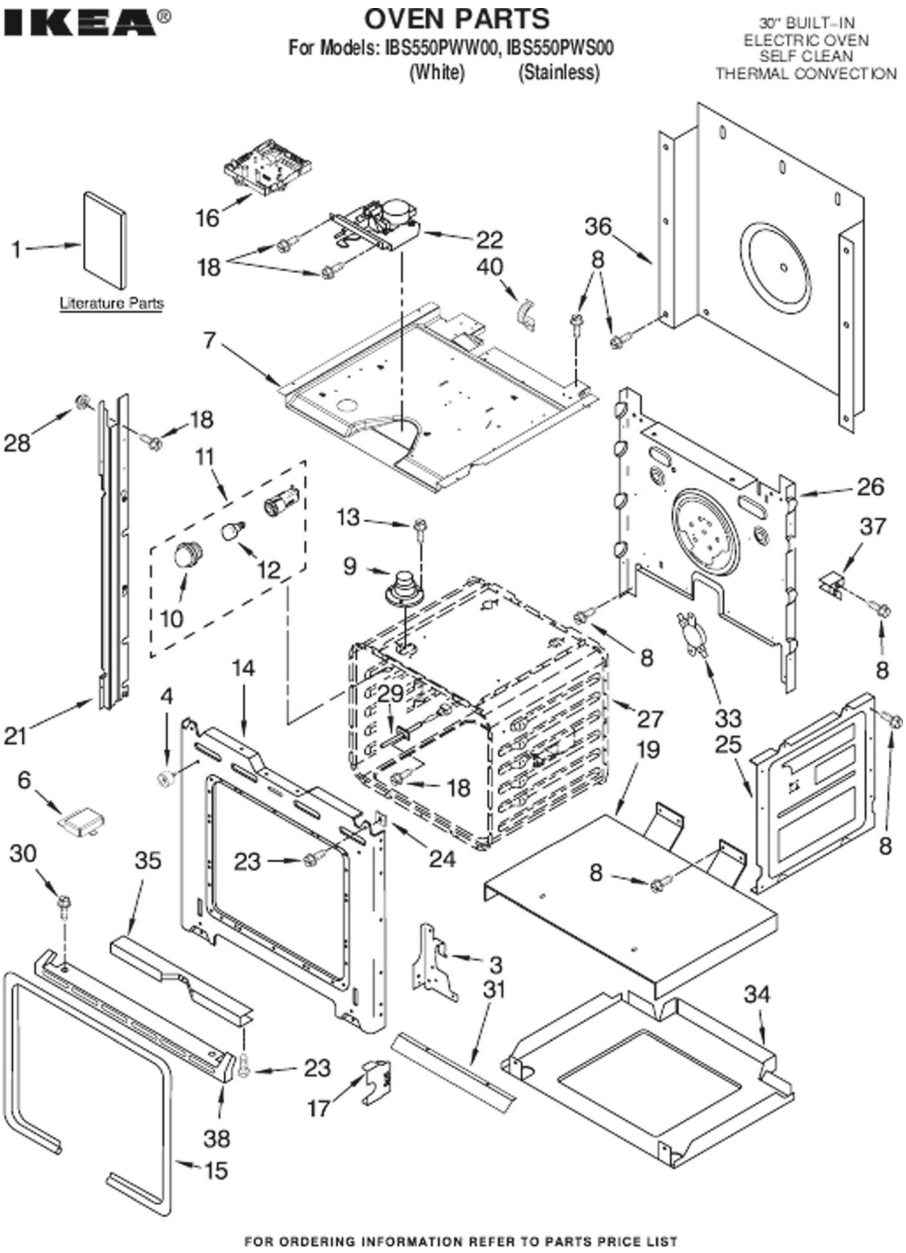


Fig. 16 The use of arrows in instruction sheets: an example

communication. So, our claim is that pictorial communication is not parasitic on language. It depends on pragmatic abilities, and pragmatic abilities are not specifically linguistic; rather, they pertain to some sort of general "communicative competence" of human beings. Of course, this does not amount to denying that natural language allows a much richer and more fine-grained specification of explicit meaning than pictures do.

So, in many cases, language can be used to disambiguate pictures. But often this is not perceived as necessary, because contextual information together with pragmatic inferences are sufficient to do the job. Rather, we sometimes use pictures and linguistic utterances in exactly the same way in order to communicate.

References

Abell, C., and K. Bantinaki (eds.). 2010. *Philosophical perspectives on depiction*. Oxford: Oxford University Press.

Albertazzi, L. (ed.). 2006. *Visual Thought*. Amsterdam: Benjamins.

Anderson, M., B. Meyer, and P. Olivier (eds.). 2002. *Diagrammatic representation and reasoning*. London: Springer.

Bach, K. 1994. Conversational impliciture. *Mind and Language* 9(2): 124–62.

Bach, K. 2006. The top 10 misconceptions about implicature. In *Drawing the boundaries of meaning: Neo-gricean studies in pragmatics and semantics in honor of Laurence R. Horn*, ed. B. Birner and G. Ward, 21–30. Amsterdam: John Benjamins.

Barthes, R. 1964. Rhétorique de l'image. *Communications* 4: 40–51.

Bianchi, C. (1999), "Three forms of contextual dependence", in P. Bouquet et al. (eds.), *Modeling and Using Context. Second International and Interdisciplinary Conference*, CONTEXT '99, Trento, Italy, September 9–11, 1999, Proceedings, Springer, Berlin, pp. 67–76.

Carston, R. 1988. Implicature, explicature, and truth-theoretic semantics. In *Mental representations: The interface between language and reality*, ed. R.M. Kempson, 155–181. Cambridge, UK: Cambridge University Press.

Carston, R. 2004. Explicature and semantics. In *Semantics: A reader*, ed. S. Davis and B. Gillon, 817–845. Oxford, UK: Oxford University Press.

Casati, R., and A. Varzi. 2006. *Insurmountable Simplicities. Thirty-nine Philosophical Conundrums*. New York: Columbia University Press.

Clark, H. 1992. *Arenas of language use*. Chicago: The University of Chicago Press. Ill.

Colors Magazine (2009) (ed.), 1000 *Signs*, Taschen, Köln.

Davis, W. (2010), "Implicature", *Stanford Encyclopaedia of Philosophy*, http://plato.stanford.edu/entries/implicature/.

Donati, S. 2006. *Cinema e Conversazione*. Siena, Italy: Prospettiva Editrice.

Downing, P. 1977. On the creation and use of English compound nouns. *Language* 53: 810–842.

Green, G.M. 1989. *Pragmatics and natural language understanding*. Hillsdale, NJ: Lawrence Erlbaum.

Grice, H.P. (1975), "Logic and conversation", in D. Davidson, G. Harman (eds.), *The Logic of Grammar*, Dickenson, Encino, CA, pp. 64–75.

Jaszczolt, K.M. (2010), "Defaults in semantics and pragmatics" (revised version), *Stanford Encyclopaedia of Philosophy*, http://plato.stanford.edu/entries/defaults-semantics-pragmatics/.

Kulvicki, J. 2006. *On images: Their structure and content*. Oxford: Clarendon.

Kulvicki, J. 2014. *Images*. London: Routledge.

Nyíri, K. 2006. Wittgenstein's philosophy of pictures. In *Wittgenstein: The philosopher and his works*, ed. A. Pichler and S. Saatela. Frankfurt: Ontos Verlag.

Sperber, D., Wilson, D. (1986/1995), *Relevance: Communication and Cognition*. Second edition 1995, Blackwell, Oxford.

Tversky, B. (2005). "Visuospatial reasoning". In *The Cambridge handbook of thinking and reasoning*, eds. K. Holyoak and R. Morrison, 209–241. Cambridge: Cambridge University Press.

Wittgenstein, L. 1953. *Philosophische Untersuchungen*. Oxford: Blackwell.