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Essays on Communication

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ESSAYS ON COMMUNICATION

by

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ABSTRACT

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Shawn M. Simpson

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One of the central issues of contemporary philosophy and biology is the nature of

communication. Early accounts of communication tended to focus on just one side of the

communicative divide – the speaker side or the receiver side – and took as their starting point the

case of human language. Animal communication, historically, was largely treated as a special

case. Now things are different. Now it appears we might have a model that makes sense of sign

use in both the human and animal realms and brings together both sides of the signaling divide.

It's still to be seen, however, how much the model actually captures, especially the farther down

we go on the animal side, and it's still to be seen how well the model captures the human cases,

especially those around the edges. The purpose of this thesis is to explore the foundations of the

sender-receiver model and to show that it can cover more than was previously imagined. Topics

discussed include the nature of communication and signaling, animal communication, the nature

of meaning or content, the communicative nature of objects such as works of art, blueprints, and

maps, and the possibility of communication between groups and collective agents.

For DeeDee

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"Of all affairs, communication is the most wonderful"

John Dewey, *Experience and Nature* 1925

Introduction

The world is filled with many wonders, and one of those wonders is communication. It comes in many forms. In the form of a greeting to a friend, "How are you, Michael?"; in the form of a ring on a finger; in the form of a song or a painting; in the form of the roar of a lion.

One thing philosophers have hoped to do is understand communication: how it came about; its limits; what counts as a sign or symbol; and what it is for something to have meaning or content.

The history goes back at least as far as the ancient Greeks. Both Plato (429–347 BCE) and his student Aristotle (384–322 BCE) worried about meaning. In the *Cratylus*, Plato has the philosopher Hermogenes suggest that "no name belongs to a particular thing by nature" (360 BCE/1997, xiii). In, *On Interpretation*, Aristotle similarly claims that words and sentences get their meanings by "convention" (350 BCE/1941). Democritus (460-370 BCE) is thought to have held a similar view (Barnes, 1982; Duvick, 2007). And Epicurus (341–270 BCE), who came after all three, provided one of the first historical theories of language's origin. According to Epicurus, people first made certain primitive sounds in certain circumstances by a sort of instinct and some of these pairings simply caught on and expanded (Verlinsky, 2005). How that process worked, how things "caught on", was largely left unexplained.

Similar worries about language existed in the Eastern world. Around the 3rd century BCE, we find Chinese philosopher Xun Zi (or Xun Kuang 荀况) (310-220 BCE) writing that "Names have no predetermined appropriateness. One forms agreement in order to name things." (3rd c. BCE/2014, p. 239). In 6th and 7th century Tibet and India, Buddhist philosopher Dharmakīrti (600-660 CE), argued that words and objects were associated via a form of convention (Hugon, 2020). In the Islamic world, Abū Naṣr al-Fārābī (870–950 CE), in his work *Kitāb al-ḥurūf* (or *Book of letters*) suggests words signify what they do via community assent (Mahdi, 1990).

In the Middle Ages and Renaissance there were philosophers who wrote about signs too. St. Augustine (354-430 BCE) was one of them.[1] During the Enlightenment, English philosopher John Locke (1632-1704) wrote about meaning in his 1689 *An Essay Concerning Human Understanding*. And in 1781, French philosopher Jean-Jacques Rousseau (1712-1778), in his work *Discourse on Inequality,* wrote about gestural communication and whether meaning really could come about by agreement: "… a unanimous agreement would need to be proposed," he writes, "which means that speech seems to have been absolutely necessary to establish the use of speech" (p. 94).

It wasn't really until the 1800s, with the development of fields such as biology and archeology, that questions about communication really took off and in a way that people today would probably feel comfortable calling scientific. In 1871, Charles Darwin (1809-1882) made a note about communication in his book *The Descent of Man*, writing that perhaps "the survival of certain favored words in the struggle for existence is natural selection" (p. 91). Not much

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[1] See St. Augustine's *Confessions* (397 and 400 CE) and *de Magistro* (389 CE) for examples of his writing on language.

later, the *semiology* of Swiss linguist Ferdinand de Saussure (1857-1913) and the *semiotics* of American Pragmatist Charles Sanders Pierce (1839-1914) started to gain traction. Saussure and Pierce both had aspirations for a general theory of signs. Pierce's model is still employed in some corners of science, and bits and pieces of his theory are now part of the special lexicon of philosophers, but otherwise, in present day, his model has largely been abandoned. The story has been much the same for Saussure, though his work is still used in some areas of research in Europe, especially by researchers in France.[2] A bit later on, German philosopher and psychologist Wilhelm Wundt (1832-1920) tried to pick up where Darwin left off. Wundt's *Völkerpsychologie* (1900-1920) discussed both human and animal communication, hypothesizing that human language evolved from animal gesture.

Just before the First World War, philosophers began to take a different approach to questions about communication. Some turned to logic and formalization to try to understand meaning. The work of British philosopher Bertrand Russell (1872–1970) and the early work of Austrian philosopher Ludwig Wittgenstein (1889-1951) fits this description.[3] Other philosophers turned their focus to everyday speech. The works of English philosophers H. Paul Grice (1913-1988) and J. L. Austin (1911-1960) are examples here.[4] Either way, the move seemed to be one away from looking for a general theory of communication – one that handled the so-called formal *and* informal aspects of language – and instead one toward different

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[2] See Saussure's *Course in General Linguistics* (1916/2011), for an introduction to his ideas on signs. Original French title: *cours de linguistique générale*. The work is a collection of notes by Charles Bally and Albert Sechehaye on lectures given by Saussure at the University of Geneva between 1906 and 1911.
[3] Russell's 1905 essay "On Denoting" is a good example.
[4] See Austin's *How to Do Things with Words* (1962), for a contrast to Grice.

programs headed in somewhat different directions. Animal communication was largely treated as a special side topic, something that could be handled with a different theory and on its own.

In the 1960s, things started to change. In 1969, American philosopher David Lewis (1941-2001) published his book *Convention* and presented the beginnings of a model that, although formal, seemed to make room for explaining the informal aspects of communication emphasized by Grice and others. Still, Lewis didn't have much to say about non-human communication, and since his story relied on things such as intentions and beliefs, it's not clear what he would have said in all cases, especially apparent non-human ones. Later on, and sort of off to the side, in 1984, American philosopher Ruth Millikan's book *Language, Thought and Other Biological Categories* came out. There Millikan articulated a natural selection inspired "bio-semantics", bringing about a way of thinking about communication that was somewhat in line with the Lewis model but that at the same time made room for the non-human side of the problem. By the late 90s and early 2000s, American philosopher Brian Skyrms, in his books *Evolution of the Social Contract* (1996) and *Signals* (2010), and other researchers had expanded the Lewis framework in part by incorporating some of Millikan's insights. It was shown that now, among other things, Lewis's model could potentially be applied to both the human and non-human realms.

And yet, this new way of understanding communication – what has come to be known as the "Lewis-Skyrms model" or the "sender-receiver model" - still has plenty to be worked out.[5] Many of the foundational questions have yet to be answered. Do all the parts matter – sender,

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[5] Many people use the title "sender-receiver model" to apply to other similar but less fleshed out models of communication that are out there. I'll be using the term here to talk not about those models but about the Lewis-Skyrms model and my extended version of it.

receiver, signal? How do mental representations or intentions fit in – are these things essential to true communication? Can the model really be applied to animals and other non-human agents? What is the meaning or content of a sign according to the model? And how does the new model compare to those of, say, Peirce and Grice – perhaps the two most beloved and relied on models around? I'll discuss these issues and others in Chapter 1 of the thesis.

Another thing a good model of communication should be able to do is capture the cases on the periphery, the cases of communication outside the standard examples. A good question is how far the sender-receiver model goes. I discuss some off cases of signaling that test the boundaries of the model in Chapter 1, but the rest of the thesis tackles this question in detail. In Chapter 2, I look at the question of group communication. We talk about people and animals communicating all the time. Australian philosopher Peter Godfrey-Smith in a recent paper (Godfrey-Smith, 2014a) argues that signaling occurs even at the level of *cells*. And yet, just as people talk about signaling occurring at this sort of lower level, between the parts of a body, or at the (for lack of better words) base level, the level of the agents made up of those parts, people also often talk about communication going on at a higher level, at the level of groups of agents or collections of organisms or animals. One might wonder: is it ever actually fair to say, for example, that China (not Xi Jinping) sent a message to Russia (and not Putin), or perhaps that it was the group of magpies cawing and crowing together that warned me of that Grizzly bear? I'll discuss the possibility of group or collective communication in Chapter 2.

One of the problems with some of the older accounts of communication was their narrow focus on human speech or writing or abstract formalizations of it. American philosopher John Dewey once seemed to express this worry. In *Logic: The Theory of Inquiry* (1938), Dewey

writes about such theorizing, "…unless carefully interpreted it narrows unduly the scope of symbols and language, since it is not customary to treat gestures and diagrams (maps, blueprints, etc.) as words or sentences" (p. 284). What are we to make on these formal models, he seems to have wondered, of things such as works of art or maps, things which also seem to have meaning in some sense but in a way different from human languages such as Lakȟótiyapi (Lakota) or Spanish? In Chapter 3, I'll look at the communicative nature of art in a number of its various forms. Is art a form of communication in the fullest sense? If so, what is expressed by a work of art – by some song, or statue, or film? Is art something only created by humans or do non-human agents engage in communicative artistic behaviors? In this chapter, I'll also take a look at how groups and evolution might be involved.

The final chapter of the thesis, Chapter 4, looks at maps, blueprints, and other communicative devices. Maps are somewhat similar to certain works of art in that they seem to have a *depicting* function – that is, they seem to show how things are. And yet, maps also usually seem to be primarily oriented toward use in navigation – to show how to get somewhere. Blueprints and models similarly seem to have some other primary communicative purpose to them aside from depiction – instruction perhaps. How does all this work from the point of view of the sender-receiver model? Are things like maps, blueprints, and other devices really communicative in some way, do they really fit here?

These are the topic explored in this dissertation – the nature of communication, its foundations and its boundaries, how it works and how it gets started, its many uses and its many forms.

Chapter 1. Signs, Signals, and Meaning

In this chapter, I lay out the basic details of the sender-receiver model. In Section 1, I look at

how the model works, how it has been developed so far, and then I make a few suggestions for

improvement of my own. I ask questions about the model's details – do all the parts matter? Is

there always a clear separation between the parts? How does communication come about? In

Section 2, I compare the model to other popular theories of communication. Does it cover the

phenomena they cover? Does it do a better job? What does it say about some of the problems

raised by those other models? Does it solve them or dissolve them? In Section 3, I take a look at

some cases that stretch the boundaries of the model. Are these cases of communication too?

What are we to make of cases that seem to fit the basic set-up but don't clearly involve

communication?   For example, how is handing you a note different than handing you a glass of

water? In Section 5, I look at the issue of meaning. What counts as meaning from the

perspective of the sender-receiver model? Do any of the old theories of meaning fit in? Are

there any other lessons to be learned from thinking about meaning from the perspective of the

model? There is also a coda section appended to the end of the chapter that follows up on some

lines of thought regarding meaning that are a bit to the side of the main discussion but still worth

pondering. What are we to say of sender-receiver systems that carve up the world in different

ways? If a lion could speak, could we understand it? And where does truth fit into this broader discussion?

1.1 The Sender-Receiver Model

The setting is Washington DC, 1972. Investigative journalist for the *Washington Post* Bob Woodward needs to meet with his informant, codenamed "Deep Throat", to discuss his latest findings on the Watergate break-in. To communicate this to his informant, Bob moves a certain potted plant from one side of his apartment's balcony to the other. Deep Throat drives by, sees that the plant has been moved, and so then heads to a pre-specified location where he meets Woodward to discuss his findings - in the actual case, at parking space D32, beneath the Oakhill Office Building in Rosslyn, Virginia.

What we have here is a simple case of communication. What has to be going on for this sort of thing to work? In his dissertation, later 1969 book *Convention*, American philosopher David Lewis presented a model meant to answer this question. As Lewis saw it, there had to be a *sender* (in our case, Woodward) and a *receiver* (here, Deep Throat). There had to be something being used as a *sign* (the potted plant). There had to be *states of the world* (here, Woodward needing to meet or not) that the sender can observe and that matter in some sense to both individuals. And the receiver had to be able to observe signals from the sender and in turn perform some *act* that has consequences for them both (in the real-world case, meeting Woodward at the garage or going home).

Lewis showed that if a sender and receiver have complete common interest – that is, they agree on what the receiver should do in each state of the world - and they both know this, and they know that they both know this, and so on[6], then if they're rational, certain combinations of strategies of sending and reacting to signals will be a *Nash equilibrium* – in other words, will be such that neither sender nor receiver could do any better by doing something different on their own.[7] Lewis called these strategy combinations "signaling systems" and he called the situations they arise in "signaling games" – a throwback to Wittgenstein's very similar concept of a "language game".[8]

In the Woodward-Deep Throat case, the signaling system there is the combination of Woodward moving the plant only when he needs to meet and Deep Throat heading to the garage only when he sees the plant has been moved. Notice, though, that Woodward could have chosen either side of the balcony as where he should place the potted plant if wanted to call a meet up. What we get with signaling systems then is also a sort of *conventionality*. There is a sense in which the potted plant signaling system could have worked either way, a sense in which Aristotle and Hermogenes seem to be right.

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[6] This sort of iterated knowledge is often known as "common knowledge".

[7] In game theory, a Nash Equilibrium – named after American mathematician John Forbes Nash, Jr. - is a set of strategies for the players in a game, one for each player, such that no player has a good enough reason to change their strategy given their preferences and given that the other players are sticking to their strategies. See Nash (1950, 1951), for the original introductions to the idea of a Nash equilibrium.

[8] In his 1953 book *Philosophical Investigations*, Wittgenstein describes a language game involving builders: "The language is meant to serve for communication between a builder A and an assistant B. A is building with building-stones: there are blocks, pillars, slabs and beams. B has to pass the stones, in the order in which A needs them. For this purpose they use a language consisting of the words "block", "pillar" "slab", "beam". A calls them out; — B brings the stone which he has learnt to bring at such-and-such a call. Conceive this as a complete primitive language." (Part 1, paragraph 2).

The ideas are very close. The main difference is that the sender-receiver model fills in the details. Wittgenstein doesn't talk explicitly about the role of payoffs and by what mechanisms communication might come about – although, he does mention that a receiver has "learnt" to do what it does. It might not be too far off to think of the sender-receiver model as roughly a more refined version of Wittgenstein's project.
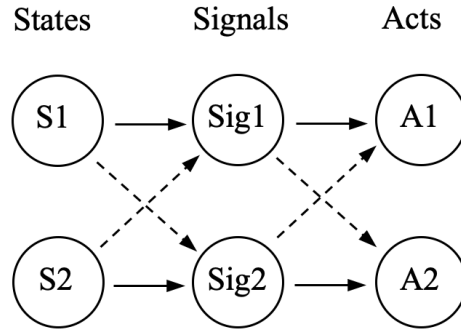
Figure 1.1. A basic signaling system lattice. Let *S1* be Woodward needing to meet, *S2* be Woodward not needing to meet, *Sig1* be potted plant on the left, *Sig2* be potted plant on the right, *A1* be head to the garage, and *A2* be keep driving. The black and dashed arrows then represent the two possible signaling systems in the Deep Throat Case.

Describing Lewis's model more formally, signaling games include a set of possible states of the world, a set of possible signals, and a set of possible receiver actions. The key is the two rules followed by the sender and receiver: a sender rule we might call f_s that maps states to signs and a receiver rule f_r that maps signs to acts. Sender rules can be things like: *send signal X in every state of the world*, or *signal randomly*; however, a sender may also follow a rule specifying a certain signal for each state. A similar story applies to the receiver side. Receiver rules can be things such as: *perform act X for every signal*, or *act randomly*; but, again, receivers may also follow a rule to perform specific acts for each signal. The combination of any sender and receiver rule gives us a mapping from states to acts. Here's one way to illustrate an abstract mapping of this sort, this time with sender and receiver in the picture.
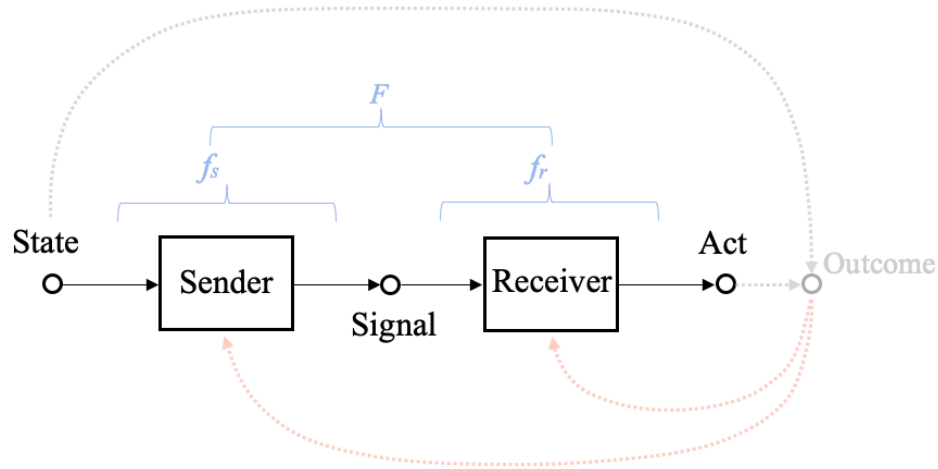
Figure 1.2. A basic sender-receiver configuration. f_s is a sender rule, mapping states of the world to signs. f_r is a receiver rule, mapping signs to acts. F is the resulting mapping from states to acts. The pink dashed line represents reinforcement from the interaction.[9][10]

In the 1996 and 2010 books *Evolution of the Social Contract* and *Signals*, Brian Skyrms showed that conventional signaling like Lewis's can arise and be maintained in a number of ways beyond rational choice, including reinforcement learning, natural selection, and even some forms of copying and imitation.[11] What's important is that the actions of the receiver in some way "feedback" and influence subsequent signaling acts of the sender, and likewise in the other direction.[12] The actions of one must have consequences for the other. Now, signaling of the Lewis sort can be seen to occur in less complex organisms – apparently possibly even in things like fireflies, plants, and cells. I'll discuss these cases in more detail in just a moment.

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[9] Does ignoring the signal count as an act? In some games it will be impossible – given the set up – for a signal to be ignored. In other games, there will be room for this sort of option to be built into the model. I hope this will become clearer as I go on.

[10] Figures 1.2, 1.4, 1.5 and 1.6 are inspired by and adapted from figures appearing in Shen (2020) and Godfrey-Smith (2013b, 2014b).

[11] Wittgenstein writes in his notes from 1937: "The origin and the primitive form of the language game is a reaction; only from this can more complicated forms develop. Language – I want to say – is a refinement, 'in the beginning was the dead'" (1980, p. 31). The last quote is a reference to Goethe's Faust, Part 1 (In the Study). Wittgenstein's thoughts here, though vague, seem to be heading in the sort of direction suggest by Skyrms.

[12] Must this always be the case – are there never one-off exchanges? This will be explained in just a moment.

Roughly, twenty years before Lewis, American scientist Claude Shannon (1916-2001) was interested in communication but approached it from a different direction. Shannon's work was on statistical theories of information flow in mechanical systems, such as telephone circuits, which in the early days were likened to the goings on in the brain.
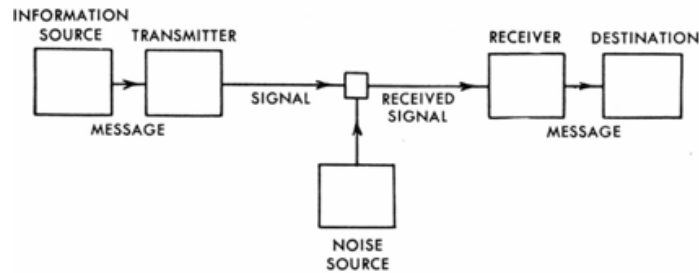
Figure 1.3. Shannon's schematic diagram of a general communication system. Adapted from "A Mathematical Theory of Communication" by C. E. Shannon, 1948, *Bell Systems Technical Journal, 27*(3), p. 380.

A signal, says Shannon, *carries information* whenever the state of the sign *reduces uncertainty* about the state of the source – in our case, the state of the world. When the value of one variable is predictive of another, he says, they are linked by what he calls *mutual information*. This sort of information is everywhere. A mountain lion track in the sand is a good predictor of the recent presence of a mountain lion. Smoke carries information about fire. To use some of Skyrms's examples, even fossils carry information about past life, and cosmic background radiation information about the early stages of the universe. Shannon's insight fits well into the general Lewis set-up. A sender or receiver can even in a sense *create* mutual information simply by following the sender or receiver rule they follow. If a sender, for example, always sends a certain signal in certain states - Julie always yells "Car!" when she sees there is a car about to hit someone - then that signal now carries information about the state of the world the sender has observed – you now can predict what Julie has seen when she yells "Car!" Similarly, if Julie

always looks around quickly when someone yells "Car!" and only when someone does so, now you can predict reliably what signals Julie has received when you observe her quickly looking around.

As I said, Lewis assumed *complete* common interest in his picture. Of course, there's a whole spectrum of interest, including *complete conflict of interest,* where agents have completely opposing preferences. For a while it was thought that in stronger cases of conflict, informative signaling could not get off the ground. A recent paper by Spanish philosopher Manolo Martínez and Peter Godfrey-Smith, however, presents a counter-example (Martínez & Godfrey-Smith, 2016). Most cases of signaling in nature will be instances of *partial* common interest that lie somewhere between the two extremes. For a real-world example, consider the vervet monkeys (*Chlorocebus pygerythrus*) of the Amboseli forest in Kenya who have developed a signal that seems to mean roughly "Leopard!". A sender vervet can sit up in a tree and observe whether a leopard is approaching. If a leopard is approaching, it is best for him and his partners if the sender sends the "Leopard!" signal since then his partners can run up a tree and out onto a thin branch the leopard can't get to, allowing the vervets to survive and so the whole group to live happily ever after (or at least for some time). But suppose that there are more than the two possible states we've just assumed – leopard approaching and no leopard approaching. Suppose that sometimes there is no leopard approaching but there is also a rival male vervet approaching, one who wants to challenge the sender vervet for his place in the social hierarchy. It could be the case that the sender is aware of this and that he would rather he keeps his place in the hierarchy than possibly lose it. And it could be that the rival would prefer to have a chance to challenge the sender vervet than miss such an opportunity. Now suppose that a rival vervet coming to challenge a sender vervet is not too common an occurrence or that the threat of a leopard is

extremely weighty. It could now come to be that a sender vervet uses the "Leopard!" call to get his friends and the rival to stop what they are doing and run up a tree even when there is no leopard so that he (the sender vervet) can prevent the rival vervet from carrying out his social hierarchy disrupting deeds. Here we could have a case of signaling that is maintained despite a lack of complete common interest. It is maintained because either the deceptive use of the alarm call is not frequent enough to make receivers ignore it or because the consequence of not listening to it and possibly getting killed by a leopard outweighs the benefit of sticking to one's social hierarchy disrupting plans despite one's preference otherwise to challenge the dominant male. This sort of signal use was observed in a vervet named Kitui, by American anthropologists Dorothy L. Cheney and Robert Seyfarth (1990). They believe Kitui's signaling this way was intentional since Kitui did it repeatedly and it benefited him.

If a receiver doesn't get anything out of a signal or is deceived too much, however – think of the boy who cried wolf - and the cost or risk of not listening to the signal is low enough for the receiver, then the receiver will simply stop paying attention (if it can), in which case the sender will then have no reason to keep sending signals the way it does, the result being that communication breaks down. Cheney and Seyfarth (1988, 1990) observe this too. Vervets learn to ignore unreliable senders of their own species and others. In general, the less common interest between the agents, the less stable their communication.[13]

Just how broadly does Lewis's model apply? Does the model capture *all* of our pre-theoretic intuitions about signaling? On Lewis and Skyrms's views, senders observe *states of the world*. But consider the case of the rowboat and the coxswain. This case is apparently due to

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[13] For another analysis of games with partial common interest, see Crawford and Sobel (1982) and Godfrey-Smith (2013a). See Sterelny (2003), for a similar point.

American philosopher Kevin Zollman but discussed in print by Godfrey-Smith (2014a, 2014b). The coxswain calls out the stroke, and the two rowers use that call to coordinate their rowing. Does this case fit the model? Supposing that the cox is not sensitive to feedback from the rowers and has no private information about states of the world (that is, that there are no states the cox is observing), this case does not seem to fit the Lewis model. The cox is more like a weird natural sign. Receivers can make this odd sign a cue of each other's actions too in virtue of how they respond to it – for example, if a receiver always rows when the cox yells "Stroke!", then the signal "Stroke!" can become a sign carrying mutual information in the Shannon sense of the receivers' actions, and this can be helpful to their partner. But this is still getting away from the classic sender-receiver setup and arguably not a *signal*, an instance of communication. Godfrey-Smith (2014b) points out that we approach something like the Lewis model if we imagine instead that one of the *rowers* calls the stroke. In this case, it might be argued that the *state* the sender is observing is something like their own intention to row. But, as Godfrey-Smith notes, another way to describe this case could be to say that agents are coordinating *acts* with *acts* rather than *states* (even internal states) with *acts,* where here the only difference between an "act" and a "state" is that a state is something not chosen by one of the agents whose choices are being modeled. The use of signs to achieve *act-to-act*, as opposed to *state-to-act*, coordination might be drawn something like this:
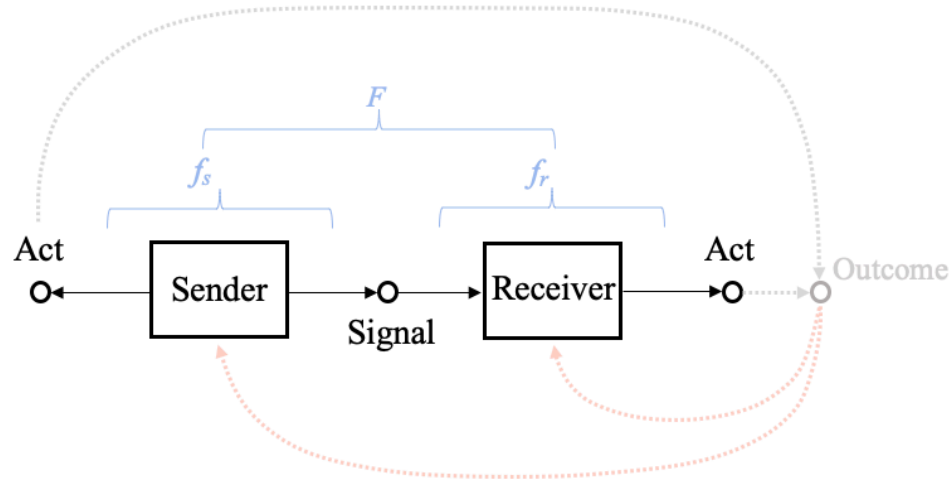
Figure 1.4. A sender-receiver system with act-to-act coordination. f_s: sender's rule, mapping acts to signs. f_r: receiver's rule, mapping signs to other acts. F: the resulting mapping from acts to acts.

Although Lewis didn't intend his model to cover such cases, I'll follow Godfrey-Smith in using the term "signaling system" to describe act-to-act cases like these as well.[14] Is there any rendering under which the original cox case, where the cox calls the stroke, could be considered a signaling system? This one is trickier. Godfrey-Smith (2014a) likens this case to a central pattern generator in the brain and seems to accept that we can call the sign in this example a signal despite the sign not apparently *standing for* or being *about* anything, and so not fitting the old Lewis-Skyrms version of the model (p. 5). I can vaguely see how a part could evolve in a larger system to "keep a beat" for other parts which then use that beat to work in tandem to perform actions benefitting the system as a whole. In that case, I'm inclined, as Godfrey-Smith seems to be, to apply the term signaling system – again, despite the sign not clearly having anything that it is *about*. But notice in this rendering there seems to be *some* sort of sensitivity on the sender side to feedback, albeit perhaps indirectly, and some assumption of sensitivity, as

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[14] See Robson (1990), for another example of this sort of set-up and use.

in the standard cases, on the receiver side. It's not just a cue case – there is some back and forth of some sort bringing about and maintaining the interaction. Godfrey-Smith seems to take a similar line in the cox case in (2014b) but without reference to the central pattern generator or a similar example. As I've argued, however, without sensitivity to feedback of some sort, this would appear to be more aptly described as just another weird cue situation, so it's not obvious what he has in mind here.

Godfrey-Smith (2014b) takes the cox case as a prompt to argue that probably the conception of signs as always *representing* or *standing for* something is a way of thinking that we need to move beyond, and I agree with him on that, though, I'll admit it's not obvious to me that the central pattern version of the cox case does not at the end of the day in some way involve a signal that has some sort of aboutness to it – I'm still on the fence about that. Even still, I think the general idea is right. If the cox signal is about anything at all, it's not obvious. Signals evolve over time and have unstable uses and meanings. Communication surprises us over and over again. Others might not feel so comfortable with such a move, think "aboutness" really matters. That's fine. Another way to look at cases like these might simply be to say that these things *create* states via their "tics" and "tocs" – a "tic" state and a "toc" state, where rowing, for example, might be appropriate for the "tic" and not rowing (or preparing to row again) preferable for the "toc", given the interests of agents using the sign and perhaps how they've interacted during those "states" in the past. Following Godfrey-Smith, my preferred way of handling cases

like these is to accept that in the real world the model will not always apply so neatly. Is it a

signal? Sometimes the answer will just be "Well, sort of."[15]
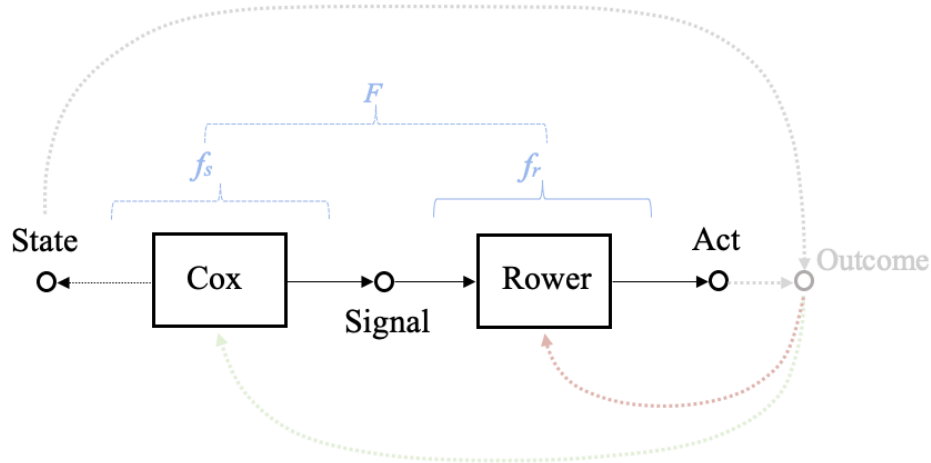
Figure 1.5. The coxswain system. The case involving the metronome-like cox might be
represented like this. The click and silence of the metronome are the "signals". There is
no state being observed by the metronome, but the clicking and silence of the metronome
creates two arbitrary states and these arbitrary states and their corresponding signals can
be used by receivers to coordinate action. Feedback in this case is indicated by a red
dashed line. The green dashed line represents the additional line of feedback that could
occur in a more complicated case.

I've been talking about cues. This is a word that biologists use. These are signs similar to the

Lewis model but not quite like the paradigm cases. These include what Grice called "natural

signs" – things like the mountain lion track or the smoke in the sky. Signs like these carry

mutual information, whether or not they confer some benefit to a receiver attending to them.

There is a connection of sorts between states or acts and signals here as well, but in these cases,

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[15] Someone might object: but isn't the difference here between the coxswain and the metronome case that calling the
stroke is a *command* and the metronome doesn't involve anything like that? Focusing on the case where the cox
"observes" no internal or external states, I want to say "No", yet the answer is a little more complicated. Yelling
"Stroke!" may *become* a command. But like the tics and tocs of the metronome, it is not a command (if any kind of
signal in the Lewis-Skyrms sense) unless the pattern of behavior has come about and is being maintained via a
feedback story of the sort I've been talking about.

there is no feedback to the sender-side, no matter what the receiver does. A version of the first

rower case fits in here, as I said, to some extent – though, in that case, there seems to be no clear

information naturally connected to the sender side as in most cues. In any case, configurations

such as these are, for lack of better words, incomplete examples of the set-ups in Figures 1.2 and

1.4.
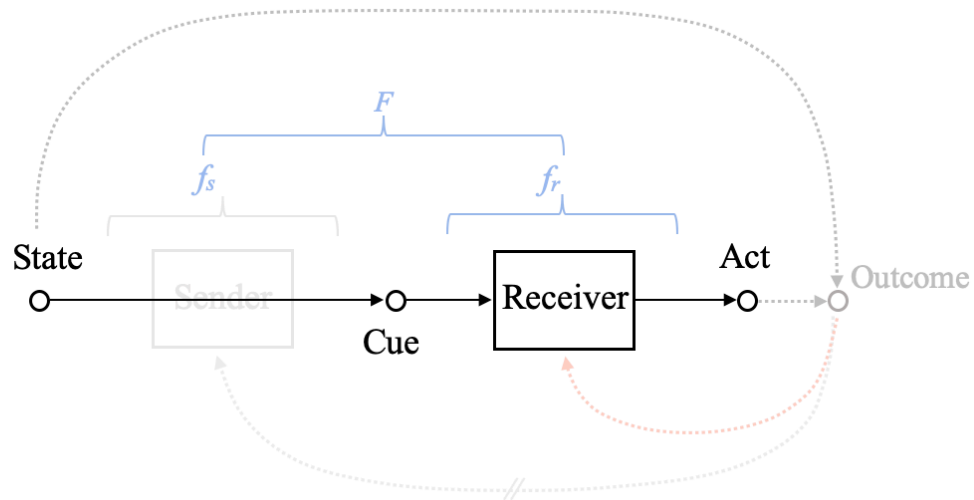
Figure 1.6. A cue configuration. A case in which the receiver's actions have no effect
on the future production of signs.

Again, although it may seem as though there is a sharp difference between all these cases, I think

it's best to see them as only a matter of *degree*. Some cues can be co-opted to some extent. For

example, when fencing became popular among upper-class German university students in the

early 20th century, some young men would self-inflict dueling scars on their faces in an attempt

to cash in on what those scars had come to represent in cue form: social class and bravery. There

are other ways the general model can come in degrees. The sender might have more signals they

can send than the receiver has actions they can perform. Skyrms (2010) and others note this

often. Godfrey-Smith (2014b) talks about receivers being more capable of changing their

signaling behavior than the sender or vice versa. One side might be more subject to error, or less reliable. The list goes on.

In the standard cases, separate objects play the roles of sender, sign, and receiver. But there may be cases where a line cannot be drawn so neatly or where one object can play more than one of the roles. An example of a case like this seems to be that of memory, where the receiver might be the sender but at a later time – for example if you write a note to yourself.[16] Godfrey Smith (2014b) provides the example of cells in our bodies. A genome, he argues, can be viewed as holding a memory of the structure of useful protein molecules, a memory that is for the cell at the cellular level and not for the greater organism of which the cell is a part – that is, the cell is the receiver and not the larger body. The cells read their genes and then produce a protein molecule or an RNA molecule serving another function in the cell. Cells carry on, read their genes, and divide and produce more cells which in turn contain these memories and do the same – the big picture result being the creation of a larger organism, but, again, the larger organism is not the one reading the genome. Who is the sender? I suggest looking at Godfrey-Smith's paper for a fuller explanation, but the rough idea is that there is no real sender. The genomes are really just highly complex cues, altered overtime by natural selection.

> Replication itself is more closely related to persistence; it is not analogous to
> inscription in the sense of the sender-receiver model. In DNA replication, a
> sequence is preserved, with slight modifications. DNA replication is not the
> creation of a sequence from some other source. Recombination has a special role,
> because it does give rise to sequences which did not exist before. But there is no

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[16] A good example of this is the film *Memento* (2000).

writing step in the sense of the model; there is no mechanism which executes a

mapping from states to signs (fS, from section 2), or a similar process whereby a

DNA sequence is produced from something else by the operation of an evolved

mechanism. Genetic material is shaped, but this occurs by means of mutation and

selection, a process in which some sequences are retained and others are lost, and

those that are retained are subject to mutation and recombination. The retention of

genetic information, especially across cell division, is an adapted process, as is its

use by a reader; its inscription is not.

In short, DNA's evolutionary embedding makes it an unsent sign, something

worth reading without having being written, even though it is very complex.

Rather than a write-read memory system, genetic memory systems comprise an

evolve-read system. (Godfrey-Smith, 2013, pp. 875-876)

Again, the way to think about the model is to realize that not all instances of signaling will fit so

nicely into the diagram in Figure 1.2 but instead that most communicative situations will lie

somewhere on a sort of continuum between the standard cases of the model and those less

amenable to being fit into the scaffolding the model centers around.

Finally, whether syntax can be made sense of by the sender-receiver model is a debate

that has been going on too. Arguably any general model of communication should be able to say

something about this.

A number of researchers have made progress on this question. American philosopher

Jeffrey Barrett at the University of California, Riverside (2007, 2009) models very basic

signaling games with signals composed of parts and where the order of parts can matter. American Shane Steinert-Threlkeld (2016, 2019) and German researcher Michael Franke (2014) offer more nuanced models. What's difficult is to get a game where not only are there parts and the order of parts matters, but where the individual parts have a corresponding meaning in some sense and where this result isn't somehow "baked into" the game.[17] Suppose we have a signal AB. We can have a game where AB ends up serving the same function as the signal BA. But we can also have a game where the order matters and so AB and BA mean different things. But it seems what we really want is something else. We want a game where the parts map to different meanings in a more complex way, a game where A means something like "Lion" and B means something like "Big", that way we can get signals like AB meaning "Big Lion" and AC meaning "Big Snake". More will have to be done before we get a model that accomplishes something like this. But it seems fair to say that a signaling system like this is more like what we have in mind when we are talking about whether a signaling system can have a syntax.

A recent attempt at an explication is due to American philosopher Ronald Planer (2019) and Planer and Godfrey-Smith (*forthcoming*). They suggest that what is important when we consider the question of syntax in signaling systems is a pair of three-way distinctions. They distinguish between *nominal, organized,* and *encoding* signals and signals that are *atomic, composite,* and *combinatorial*. *Atomic* signals are simply solo signals. So, consider the signals

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[17] This is a complaint sometimes levied against Barrett's models. Suppose we have a game with two senders and one receiver. Suppose one sender can see if there is a leopard or a snake and send A or B. The other sender can see whether it is big or small and send C or D. If different actions are required for different combinations (big snake vs. small snake vs. big leopard vs. small leopard) then a system can get off the ground where A is sent whenever there is a leopard and B whenever there is a snake and C whenever the entity is small and D whenever the entity is big. It might seem we have the sort of correspondence to meaning we are looking for (despite order of the signals not mattering), but the correspondence here is in a way forced by the set-up of the game instead of developing organically. What we want is for one sender to learn to send these sorts of signals on their own, to learn to combine signals and use particular atomic signals to stand for particular things.

in the Deep Throat case. There are no parts to them. It is not the case that, say, the color of the pot combined with the pot's location determines the meaning – it's just the location of the pot. *Composite* signals are signals that have more than one part. So, for example, the AB signal as opposed to an A signal; the plant location plus the plant color as opposed to just the location of the plant. A *combinatorial* signal is one where, according to Planer and Godfrey-Smith the "order", "sequence properties", or some other sort of relationship matters – so, for example, the order of AB mattering and resulting in a different meaning than the signal BA. *Nominal* signals are ones where there is no role for the relationships the parts of the signal might have to each other – so consider the case where AB and BA mean the same thing; or where whether the potted plant is yellow or red doesn't matter, just its location. An *organized* system is one where the relationship matters – so BA and AB mean different things. What an *encoded* system is is harder to pin down. Planer and Godfrey-Smith write: "When combinatorial signs have their meaning specified by an encoding principle that gives a semantic role to the sequence properties of signs, we have syntax" (p. 11). But this limits syntax to only cases of signals where there *is* a sort of sequence, and they are not clear on what they mean by that. Elsewhere in their paper they write that what matters is the "relation-between-relations" but this too is left unclarified. The two examples they give are of binary code and animal alarm calls. In the binary case, the sequence that matters seems to be the order in a list of 1s and 0s. In the alarm call case, the sequence seems to be the decibel level of the call. What matters in both is the mapping of the order in the list and the decibel level of the call systematically to some other relationship – so in the case of the animal call, the distance from the predator: the louder the call, the closer the predator. In Planer's paper, he also says that what matters is a "pattern" in the way states are mapped to signs, and that where the mapping is "completely haphazard" there is no encoding.

I have a number of worries about this analysis. First, it's not clear why "completely" in "completely haphazard" is important here – how haphazard can a mapping be and still count according to their analysis? I don't know and they don't say. Second, as I said, they don't really spell out exactly what they mean by "sequence" here and their analysis doesn't make clear why a "sequence" or "pattern" is really necessary. Consider the Woodward case again. Suppose Woodward made it so that not only did the plant's location tell Deep Throat that he wanted to meet but that the color of the potted plant corresponded to how soon Woodward needed to meet. Then there is a sequence in how soon Woodward needs to meet – from sooner to later – but there is *no* corresponding sequence in the colors – compare this to the alarm call case where there is a sequence in the call – decibel level – *and* the world – the distance of the predator. There would be a sequence in the Woodward signal if it were the *hue* of some color or the size of the plant that corresponded to the urgency of needing to meet, then we have a sequence that can be useful for receivers when it comes to predicting what, say, a potted plant of size *N* in location y means, or hue *H* of red means, but it's not.[18] Consider also the case where Woodward uses the color of the plant to indicate something other than some sort of "scalable" property, where by a scalable property I mean something that comes on a scale or spectrum – things like distance, time, weight. Suppose he uses the color of the plant to mean he wants to meet at the garage of that color. Here there doesn't seem to be a sequence in the nature of the signs – the size of the signs, their decibel volume, their hue - but there *is* still some sort of systematic mapping – from color to color.[19] We can even imagine Woodward using the yellow flower to mean the red garage (which

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[18] To my knowledge, Godfrey-Smith, in his course on Pragmatism at the Graduate Center, CUNY made the first suggestion that this might be a reason sequence mapping is helpful – that it allows for prediction of the meaning of not yet encountered signals.

[19] Cases such as these too could be helpful for predicting the meaning not yet encountered signals in a way similar to the sequence mapping cases.

in the real world might be a good thing for someone engaging in this sort of covert activity to do). I would suggest expanding encoding to include cases such as these also.

Another problem seems to be the case of the *composite-encoded* signal. Why must order or sequence matter for something to count as a case of syntax? This case has a systematic mapping of signal parts to other properties, has a "relation-between-relations" – A means "Lion" and 1 means "1 foot away" and so A1 means "Lion one foot away" but it is also such that 1A means the same thing. It's not obvious why a language that operated this way should not also be considered having a syntax. Some analyses of Latin, suggest that it works this way, that order doesn't matter – though, others disagree.[20] But it doesn't seem impossible to imagine a human language that would work this way. And it seems somewhat arbitrary to set these cases aside as cases of language without syntax.

There's more. Planer points out that in the case of binary the order matters but there are not unique atomic signals being mapped to unique things in the world. 1s and 0s are all there is in a binary stream and they are reused. So, compare 100010110 having a different meaning from 101111110 and the order mattering and ABCDEFGHIJ having a different meaning than ABCJIHGFE, where in the letter example the individual atomic parts are not being reused – A and B only appear once. Both kinds of signals can have mappings from parts to meanings, but one reuses signals and determines their meaning in some particular instance in part also by their *place* in the sequence and one doesn't do that. Planer points out that something similar but slightly different happens in natural language too. The word 'he' has a certain meaning in "Spencer told Kevin he went to the store" and that meaning is different when used in the

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[20] See for example Devine & Stephens (2006) and Spevak (2010).

sentence "Kevin told Spencer he went to the store". Of course, there is also something that is

somewhat the same in the meaning of 'he' in both cases – it has the sense of being about a man,

or refers to the person whose name comes before it.[21] But what is important is that what seems

to be going on is that the order of the parts can sometimes play a role in determining the meaning

of the parts as well. Compare this to the sentence "Connor likes the blues" where the order

doesn't seem to play a role in specifying the meaning of the parts. Planer suggests we extend

compositional encoded signals to fit these cases where order can have a role in determining

individual part meanings too. I'll add another slightly different case that I think we should

include as well. Consider the sentence "I went to the store". Here word order matters and the

parts map to specific meanings but the meaning of 'I' changes (in the sense of its referent)

depending not on what other words appear before it, its place in the order, as in the Spencer and

Kevin case or the binary case, but on *who sends* the signal. Probably there are other examples

out there that stretch the boundaries and expand the category, but I won't try to mention them all

here.

I'll consider one more reason I think the reliance on "order" and "sequence" is

problematic. I'll expand on this idea in Chapters 3 and 4 when I talk about art and maps.

Consider something like a grid system. A simple example is a 2x2 grid. As we saw, a signal

such as ABCD can be encoded and compositional. The order can matter and it can be that each

atomic part has a certain meaning it maps to in a systematic way. But a grid system can do

something similar.

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[21] Planer does not mention this aspect of the example, that words like 'he' still seem to maintain *some* part of their meaning despite the difference in what words come before them. Rather he simply says that the meaning changes. I'm not sure if he'd disagree with me here, but I consider this subtly worth pointing out.
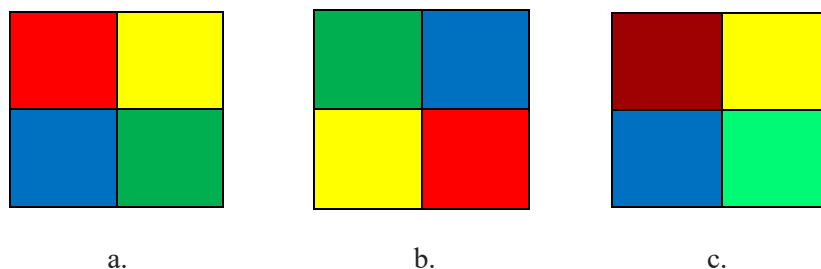
Figure 1.7. Encoded combinatorial grids.

The grid from Figure 1.7a can have a meaning different than the grid from Figure 1.7b and it can

be that the meaning is not just a matter of combination but also composition yet where in this

case composition is extended to mean the "arrangement" (for lack of better words) of the parts in

a two-dimensional sense, not just in a one-dimensional sense – that is, in the sense of from left to

right, in the sense of a place in a sequence like the 1s and the 0s. "Order" just seems like the

wrong word to use in the grid case. And we can further imagine that the hue of the squares

matters too. It might be that the hues map in a systematic way to certain meanings, in which

case the grid from Figure 1.7a will have a content different than that from Figure 1.7c despite

having the same colors in the same arrangement. I can even imagine this sort of situation being

expanded further to include three-dimensional examples and possibly more.

To me, this makes syntax seem like a tricky category with many possible variations. My

take on all this is that maybe it's just better to drop the talk of syntax. Maybe it's just better to

say a signal is "nominal and combinatorial" or "composite and organized" and makes use of

sequence or not or some other systematic mapping or has this odd feature or that, and leave it at

that, rather than spend our time trying to define a term like syntax that is so unclear and so

historically mired in debate. Some won't like this, but it seems to me that everything that needs

to be said is said when we describe things in terms of "encoded and combinatorial" or whatever

anyway, and sometimes the job of philosophy is to show that old ways of thinking, old concepts, aren't always reducible or worth keeping.

Some have hoped to use syntax as a way to argue that only humans use "true language" – whatever that is. This observation instead reorients us to asking whether animals use "encoded combinatorial" signals or "encoded organized" signals or whatever instead. Planer and Godfrey-Smith don't include anything other than human language sentences and genes in the box on their chart listed under "encoded combinatorial", so presumably they think animals don't. I don't know whether any animals do have encoded combinatorial language, but even if they don't it doesn't mean animals don't *communicate.* That they do in the sender-receiver sense is clear. But if one decides to call combinatorial encoded signals and only those "true language" and so conclude that animals don't use language, that's their choice, though I don't see a motivation for it.

How might a story of the development of some of these more complicated signals go, signals with a sort of sequence or other features? Planer and Godfrey-Smith provide a couple examples. In the case of a signal involving a sequence, they suggest the following. An animal is able to distinguish whether a certain predator is around, and it develops a particular signal for this. This is just like a basic signaling game. But suppose that perhaps the closer the predator is the louder the sender animal just happens to send its alarm. It could be that it just does this out of panic, not because it's trying to communicate anything by the decibel level. But if receivers start to notice this correspondence between decibel level and distance and take advantage of this fact, then there can be a back and forth such that eventually you get a signal that maps to a particular animal *and* that also has a mapping from decibel level to predator distance.

A story like the one above could get even more complicated. Suppose that instead of the decibel volume of a call mapping to distance it maps to size of the predator. The louder the bigger. If size matters to receivers, something like this could get off the ground in the same way as earlier. But suppose distance mattered too and senders for whatever reason had a tendency to send the signal more times in a row the closer the predator. Then we could get a signal with *two* systematic mappings. Numbers of repetitions of the call mapping to distance and decibel level of the call mapping to size.

How about a call with sensitivity to order in its parts? This case is more imaginative, but it still tells a *how possibly* story.[22] Suppose there are multiple kinds of predators and that those predators can come in a variety of colors. Suppose further that receivers can do well by responding to the presence of certain types of predators with certain actions and certain color predators with other actions but that if they could distinguish the color *and* type of predator, that there is an action for that combination that is even better than doing one of the color or predator type actions, that is, that there is an ideal *color-predator* action. It could be that one sender is able to observe the color of the predator and another is able to distinguish the type. Perhaps originally only one sender is around at a time, and so a system develops with unique signals for unique predator types and another system develops with unique signals for unique colors. But then suppose both senders are sometimes around. A receiver could become sensitive to the combination of information it is now receiving and learn that combining the signals allows it to pick out the more ideal action. Perhaps it's even the case that one type of sender tends to send its information first (maybe color is easier to distinguish from a distance than type of animal or vice versa). Then we can get receivers who might end up becoming sensitive to combination and

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[22] This story is adapted from Planer (2019).

order. Over time, it could be that we get a sender who is in a position to be able to observe both color and type. Now we can get a system going where a sender sends a certain ordered pair of signals distinguishing a particular color and type of predator and a receiver uses that ordered information to act appropriately. And this can go yet even further. Suppose also that senders tend, as in the earlier story, to make louder calls the closer the predator is but that they do so not with one of the unique signals for the predator types and colors but with a grunt at the end of their calls that they just for some reason tend to append to the end of their signals. We can imagine that the grunt was always there but that it never carried any information in the previous games and so was never used by receivers to inform their actions. Now we get a signal with order *and* a systematic mapping. The signals can say something like "Red lion 5 feet away". I know there are no red lions – hence the game being imaginative – but it still shows us how in a simply way something like this might evolve. What we get is that it is possible for compositional encoded signaling to evolve within the sender-receiver model. Granted this is a very basic sort of compositional encoded signal. But more sophisticated signalers will be able to arrive at compositional and encoded signals in more interesting ways.

That's it for my introduction to the sender-receiver model. What's essential is the focus on both sides of the signaling equation – the sender side and the receiver side – and the co-evolution of sender and receiver rules. As I said, the model is a fairly new one, and it's still being developed. It's come a long way since Lewis. But I think now with at least this much in our background we can go on and start answering some more interesting questions.

1.2 Comparisons

There are two views of communication that I would like to compare the sender-receiver view to: the general Gricean view and the Peircean view. The selection isn't random. I choose Peirce because of his continued use in other disciplines, especially scientific disciplines, and his model being another attempt at a general theory of signs. I choose Grice because of the wide acceptance of his take or some version of it by many in the philosophical community today. One version of the Gricean view I will look at in particular is the so-called *ostensive-inferential* model, put forward by American anthropologist Thom Scott-Phillips in his recent book *Speaking Our Minds* (2014). The views are also worth looking at because of their differing approaches to handling questions of meaning. As we'll see, Pierce tends to focus on the receiver side of signaling and Grice on the sender side.

1.2.1 C. S. Peirce

Let's start with the semiotic theory of American philosopher and pragmatist Charles Sanders Peirce. Peirce revised his theory of signs a number of times over his career, but the main idea remained basically the same. Roughly, to be a sign is to be *used* as one. "A sign," writes Peirce, "is something which stands to somebody for something in some respect or capacity" (1931-1958, vol. 2, p. 228). He calls what a sign stands for its "object", where this is, well, an object – a book or a chair, for example. The "somebody" a sign stands to Peirce calls its "interpretant", where this is something like a receiver or reader, someone who (or something that) "uses" a sign.[23] The thing playing the role of a sign, what some people call the "sign-vehicle", Peirce calls the

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[23] Peirce also frequently uses this word to talk about interpretations or the process of interpretation.

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"representamen". He sometimes calls these "signs" too, but strictly speaking, a sign is more than

just a sign-vehicle – it's an entire representamen-object-interpretant triad, and each part is

essential. We might represent Peirce's model this way:
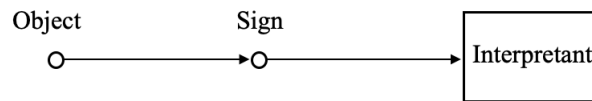
Figure 1.8. Peirce's semiotic model.

For Peirce, signs come in three kinds: *icons, indexes*, and *symbols*. Icons signify their objects in

virtue of similarity or resemblance and according to Peirce are the easiest signs to use,

resemblance being something that is simply just very simple for us to recognize. Peirce's classic

example of an icon is a realistic painting or drawing functioning as an icon of its object, but the

resemblance involved in an icon doesn't always have to be visual – I could say "meow" anytime

I wanted to signal the presence of a cat, there could be a phonetic resemblance (Peirce 1868, ss.

11-14). Indexes signify their objects in virtue of spacio-temporal correlation and are thought to

be slightly more difficult to recognize due to the receiver having to notice and learn the

correlation. A common example given of an index is smoke as an index of fire. In this

particular case, the correlation supporting the relationship is the result of physics and chemistry –

in Peirce's terms, there is a "real connection" between smoke and fire. And yet, the correlation

grounding an index doesn't always have to be so strong. Peirce seems to admit of arbitrary

indexes, indexes not "really connected" to their objects. An example of this sort of index might

be the alarm of a smoked detector indicating smoke and fire. Indexes "really connected" to their

objects Peirce calls "natural signs", where these include, he says, things such as genuine crying and laughter and other "physical symptoms" (Peirce, 1885, p. 181).

Symbols, according to Peirce, signify their objects in virtue of "convention" or an agreed upon "habit of use" and are the most difficult signs to use.[24] Unlike icons and (most) indexes, symbols are connected to their objects arbitrarily, which is to say they are connected neither by some similarity to their objects nor some physical connection to them. Symbols are also sometimes referentially displaced. In other words, unlike indexes, symbols might be present in the absence of their objects (for example, I might talk about my cat even when he's not around).

As I said, according to Peirce (and many modern interpretations of his model), symbols are the most complex of the three kinds of signs. One common idea is that the three kinds of signs are related hierarchically – indeed Peirce thought this. Symbols, so the thought goes, are constructed upon indexes, and indexes upon icons. You've got to be able to use the less complex sign forms before you can use the more complex ones. And so, the development of sign use follows a certain pattern or sequence, one in which you start off with icons and - in the human case - end up with symbols. Later researchers have accepted this hierarchy (Hovers et al., 2003) and (Rossano, 2010) and other have seen it – and the supposed fact that only humans use symbols – as evidence that symbol use requires an advanced level of cognitive sophistication, perhaps involving things like intentions, mind-reading, or common knowledge. American anthropologist Terrence Deacon adopts a position of this sort in his book 1997 book *The Symbolic Species*.

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[24] Sometimes written "general effective rule", "disposition", or "law".

So how does the theory compare with the Lewis-Skyrms model? Let's start with the

basic structure. Right away there are some fairly obvious differences between the two views.

Peirce's view is basically a theory of the *receiver* side of the configuration in Figure 1.2. Unlike

Lewis and Skyrms, Peirce isn't concerned with the relationship between sign production and sign

use. He's more concerned with *interpretation*, with how the receiver gets a grip on the meaning

of signals. The work of Donald Davidson in the 60s and 70s shares some similarities to this

approach. A further difference can be seen in what is on the left-hand side of the signs in two

configurations – states of the world vs. objects.

Consider again the rowboat case. The coxswain calls out the stroke, and the two rowers

use that call to coordinate their rowing but there is nothing internally or externally the coxswain

is observing. Again, there doesn't seem to be a state of the world being referred to, at least in the

Lewis sense. And I don't see how you could construe the case to be about an object either.   Is

there an object in the Peircian sense in this modified case that the signal is about? Not

obviously. Saying that the signal refers to the caller's intention to stroke (is that an object?) or to

the boat or oar seems a stretch, and I don't see any other plausible candidate.

How about icons, indexes, and symbols? Are there analogs in the sender-receiver view?

Indexes are like the cues or natural signs in Figure 1.6. However, cues or natural signs won't

always have senders unless we count *the world* or some part of it as the sender – and yet even

then the right process of co-evolution and feedback won't be there. It's also not the case that

these signs must refer to a Peircian object. The color of the leaves might be a good indicator of

the weather or the time of year (who is the sender here?), and these – the weather, the time of

year - are not obviously objects in the Peircean sense and in fact seem to be better characterized

as states of the world or something else altogether.[25] Many Peircian objects will be like this –

this is not something specific to the case of the autumn leaves. And, again, although it might

seem that there is a sharp difference between paradigm and partial cases of signaling systems as

Peirce's framework makes it appear, really it is only a matter of degree. We saw this in our

discussion earlier about things like genomes and memory.

Is there a place for icons and symbols in the Lewis model as well? Here is what I take to

be a plausible account of icons. A sender might be able to create or happen to have on hand

signals that resemble particular things or states of the word he observes. He might notice that

receivers are prone to certain reactions when something resembles something else. Noticing

resemblances of certain sorts is plausibly evolutionarily beneficial, so this is not out of the realm

of possibility. Once it is the case that individuals are using resemblance as indicators of a sort it

becomes a useful and exploitable fact, such that on the production side you become sensitive to

this. You take advantage of this tendency and hijack the already trained up reaction. Now you

get something like a classic sender-receiver system. You get people using certain signals

because they know they will be reacted to in a certain way. Of course, this is going to be a

matter of degree. And it could go both ways. It could be that senders are for whatever reason

inclined to send signals that resemble the state of the world – to initially say "meow" for the

presence of a cat - and receivers simply have to learn this.

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[25] One might worry that I'm taking the notion of an "object" to literally here. Isn't lightening an index of thunder?
Unfortunately, it's just not clear how literal one should take Peirce to be on this matter. He wasn't very clear in his
own writing on this.

Now symbols. This case is easy. I take it as obvious that signals in the sender-receiver sense are good analogues of Peirce's symbols. Just like symbols, they are conventional, and they seem to be capable of displacement.

What does all this say about the famous Peircian hierarchy? Are symbols really a good sign of cognitive sophistication and require things like intentions? And what does this say about the idea of a sequence where the more complicated signs depend on the less complicated ones?

I hope it is clear from what's already been said in this chapter that symbols are *not* good indicators of cognitive sophistication. The sender-receiver model shows us that signals (symbols) arise in even the simplest signaling systems, even in cells. I said I'd discuss fireflies and plants too. Consider the *Photinus* genus of firefly. It's been observed that females of certain *Photinus* species send off a particular flash when they are sexually receptive. Males of the species notice this flash and fly over to the females to reproduce. Successful interactions in these games keeps the signaling system going (Stanger-Hall & Lloyd, 2015). The mating signal of the *Photinus* firefly is a symbol in the Peircean sense. It's conventional (a different flash pattern could be used). And yet, I think most would agree that fireflies do not have the kind of cognitive sophistication researchers suggest is necessary when they talk about symbols.

For a case involving plants, consider the beautiful colors observed on the leaves of many trees in autumn. In 2001, English evolutionary biologist W. D. Hamilton proposed that these might serve some sort of signaling function. Recent studies have suggested that for at least some species this might be true. Biologist Marco Archetti ran a study revealing that aphids (*Dysaphis plantaginea*) avoided apple trees (*Malus pumila*) with red leaves in autumn and that the fitness of the aphids in spring was lower on trees with red leaves than green ones (Archetti, 2009). The

same study also found that trees with red leaves tended to be lower quality hosts and tended to be more susceptible to fire blight, a disease caused by *Erwinia amylovora*, a bacterium transmitted by aphids and other insects. There seems to be room for a plausible co-evolutionary story here too. Trees that developed red leaves had a better chance of avoiding infection and therefore surviving. Aphids that avoided trees with red leaves had a better chance of successful reproduction. Have that game play through enough generations, and you get colored leaves functioning as a signal.[26] Again, the signal is a symbol in the Peircean sense. It seems to be conventional (presumably some other color or sort of signal could have evolved). And, again, I take it most researchers would probably agree that trees do not have the kind of cognitive sophistication many have suggested is necessary for sign use. What we get is that the cognitive sophistication hypothesis of symbols just doesn't bear out.

Are symbols built upon a foundation of icons and indexes? That was another hypothesis we were considering in this section. Godfrey-Smith (2014b) argues that they are not, that symbols are not built upon a foundation of icons and indexes. I think he is right in one sense but wrong in another. His argument is that symbols (signals) simply arise ready-to-go as a product of the sender-receiver process; they don't get there by senders and receivers first going through some sort of Pierce-like transition story of sign use. He takes it for granted that if we've understood the sender-receiver model, then we will see this too. Consider again the fireflies. Pairings of receptive females who send a flash and males who fly over to investigate propagate

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[26] Fungi might even exhibit signaling. Some researchers have suggested, for example, that some bioluminescent fungi might use their glow to attract insects who then get the fungi's spores on them and disperse the spores when they leave (Oliveira et al., 2015).

the species and the signaling behavior. Fireflies didn't have to first recognize some sort of icon and then also some sort of indexical relationship.

Godfrey-Smith does go on to say, however, that a transition of the sort described by Peirce isn't totally implausible, sometimes. A sender and receiver might come to see that a sign has a specific indexical content and then recruit that index for symbolic purposes. When this happens, he says, there is a sort of transition. But a move from supposedly lesser to more complex forms of signs use isn't always necessary. For an example, consider a tribe making clothing out of the materials available in their area. Another tribe might come to notice that anyone visiting them wearing that sort of clothing is a member of that tribe. The first tribe might notice this and so, despite other materials being available for making clothing, continue to make clothing in that style so as to signify their tribal membership.

I think the transition story Godfrey-Smith tells is plausible. However, I think that in assuming a certain understanding of Peirce he missed a version of the hierarchy view that appears to hold some weight. It is a version that Deacon endorses in *The Symbolic Species* (1997) – though, with a bit more cognitive machinery added.

The reading goes like this. For a sender or receiver in even a paradigm model to get signaling off the ground, they have to be able to recognize a sign as being a *kind* of sign, as a *token* of a *type*. If the game involves a red flag and a blue flag, the sender and receiver have to be able to tell that a red flag is a red flag (and not a blue flag) and a blue flag is a blue flag (and

not a red flag). This is one kind of iconic relationships signs have on the Peircian model, and this is the interpretation Deacon takes of them in his book:[27]

> …as human children become more competent and more experienced with written words, they gradually replace their iconic interpretations of these marks as just more writing with indexical interpretations supported by a recognition of certain regular correspondences to pictures and spoken sounds, and eventually use these as support for learning to interpret their symbolic meanings. In this way they trace a path somewhat like the archeologist learning to decipher an ancient script.
>
> (1997, p. 74)

On this reading, icons have a sort of *dual* iconicity. That is, for Peirce not only is a drawing of a cat an icon of that cat, if identical drawings were made, they would be icons of that cat and of each other (the drawings) as well.[28] What matters is simply that there is some abstract resemblance - that they are this shape, or blue, and so on.

Now take a look at indexes again. On this new understanding, to use a mountain lion track as an index of a mountain lion, you must first be able to tell that what you are seeing is a mountain lion track, that it is a token of a type of sign, that it is a mountain lion track and not a bear track. And so, being able to use indexes requires first being able to "recognize" in some sense one sort of "iconic" relationship.

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[27] One might object: "But a red flag doesn't stand for a red flag. It's not an iconic sign of a red flag." Perhaps, but this *is* one use of the term 'iconic' that Peirce and Deacon use. Whether they *should* use it that way is a different matter.

[28] Again, one might disagree with this way of understanding iconic relationships, but it is the one Peirce and Deacon take.

Now symbols again. To use, say, one flag as a signal for one state and another flag as a signal for another, agents must build and learn something like an indexical relationship, they must notice a correlation between the world, the sign, and various actions – though, not necessarily a strong spacio-temporal correlation. And, again, to do any of that we would need icon use of the sort already mentioned.[29]

So, it seems there is plausibly some motivation for a Peircean sequence or hierarchy – at least, if we take what appears to be Peirce and Deacon's interpretation. But is it also true that each level of the sequence requires more cognitive sophistication? As I said, signals (or Peirce's symbols) can arise apparently even at the level of cells, even in fireflies. In that case, it seems doubtful that signal (symbol) use is a mark of some significant new level of cognitive sophistication found only in humans. But some philosophers think things like "intentions" matter when it comes to communication. Fireflies, they will argue, cannot *intend* that something – in their case, some flash they emit - mean something, whereas humans can, and this is important. Let's look now at some views that take a position like this.

1.2.2 H. Paul Grice

English philosopher Hebert Paul Grice is famous for his work on language, most notably his 1957 essay "Meaning" and 1967 lecture "Logic and Conversation". Grice approached questions

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[29] I say not necessarily a strong correlation mainly because of things like cases where it's beneficial to have a high false-alarm rate. Here the correlation might be stronger between the sign and something that causes false positives than the thing the sign is really about.

of language from an "ordinary language" point of view, looking at how people actually use language and how they talk about it.

In the essay "Meaning", Grice looked at the way people use the verb 'to mean', and he noticed that people, at least in the West, tend to use it in roughly two ways. In the first case, people used it to talk about what he called "natural meaning" (or "meaning$_N$"). They do this when they say something like "Those clouds mean rain" or "That shed snakeskin means there's probably a rattler around". There's supposed to be a sort of "natural" connection – hence the name - between the sign and whatever it is about. This kind of meaning is contrasted with "non-natural meaning" (or "meaning$_{NN}$"), which we see talked about when we say things such as

'Green' means "go"   or   The word 'Hola' means "hello"

This sort of meaning is conventional, and, as most Griceans see it, occurring only at the human level.

Are there analogues to natural and non-natural meaning in the sender-receiver model? I think it's fair to say that natural meaning maps fairly well onto the sort of setup in Figure 1.6, the sender-receiver model involving just the ride-hand side. These are the cues involving mutual information such as the mountain lion track. They are similar to Peirce's indexes. One difference here, however, between the sender-receiver view and the general Gricean view, is that on the sender-receiver view, things like Grice's natural signs will come in degrees – natural signs and non-natural signs will be on a sort of continuum.

Why do Griceans tend toward thinking the continuum view is wrong, that there is some significant difference between so-called natural meaning and non-natural meaning? And how

does this aspect of Grice's view square with the sender-receiver model? One reason motivating

a distinction is the involvement of *intentions* – the intentions of senders and receivers. We talk

about people *intending* to say this or that or about someone recognizing my *intention* to

communicate something. But we don't talk about fire *intending* that the smoke it emits mean

"Fire". And people disagree about whether to use the language of intentions to describe the

behavior of animals and other non-human creatures. Grice and other philosophers debated what

sort of intentions were important here. I don't want to wade into that debate right now. But

Grice and those who adopt a view like his seem to more or less universally agree that at least

some sort of intentions are important, and I don't think that it is crucial for the point I want to

make in just a moment, that we takes sides on the issue right now.

So how does the basic idea that intentions are important square with the sender-receiver

model? Recall that Lewis's early version of the model relied on intentions. Intentions, then, at

least cleanly fit the basic model at the human level. In *Signals*, however, Brian Skyrms extended

the basic Lewis model and argued that, intentions or not, if the model applied via other

mechanisms – reinforcement learning, imitation, evolution - then what you had was a signal and

so also counted as communication.[30] What should a Gricean think or someone who thinks

intentions are important but who is also interested in using the sender-receiver model? Recall

again that the model apparently even applies to *fireflies, plants, and cells*. How can a Gricean

handle these cases? I see four options. One option is to accept the sender-receiver view and to

hold onto intention-based semantics, the result being accepting that beliefs and intentions of

some sort – perhaps increasingly less sophisticated sorts - go all the way down. Another option

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[30] I will not deal here with the issue of whether these extensions are defensible. I think the arguments and models provided by Skyrms and colleagues are good and convincing. For those interested in following up on the issue, I recommend Skyrms's book *Signals* (2010).

is to accept the two views but reject the analysis of the cases - and yet many of the non-human cases seem fairly good. A third option is to say that both human and non-human signaling involves communication of some sort but that the two cases are still in some way fundamentally different, perhaps because the human cases involve intentions (or more complicated intentions) and non-human cases don't. But then notice that the two cases – the human case and the non-human case - would still both count as communication, it's just that human communication is on this view special because of the (kind of) intentions involved, where why intentions themselves are special here is yet to be spelled out – we could call the human case communication$_{NN}$ and the non-human case communication$_N$ if we really wanted to. Finally, one could reject the sender-receiver view in order to maintain that only humans *really* communicate, perhaps because one *already* accepts that we're the only ones with beliefs and intentions and that those are essential for communication. But then this last option seems question begging.

Another way to look at it might be to wonder if this is all just the wrong way of thinking about things. Perhaps it's not a question of when there are or aren't intentions behind a signal or mental life in the communicators because communication and mental life - as Dewey seemed to think – go together. I can see the beginnings of a sort of deflationary view, though I won't try to develop the view here. Beliefs are cashed out in terms of input and output rules and the dispositions of agents given previous inputs and outputs. Having an intention is roughly to be in the right input condition and have the right disposition. Chinese philosopher Jian Shen has developed a formal model of a view very similar to this which also possibly makes room for a distinction between indicative and imperative signals, signals that say how things are vs signals that say what to do (Shen, 2020). Other attempts to distinguish indicatives from imperatives have been made by Huttegger (2007) and Zollman (2011). One way forward might be to think

about imperative signals as signals that have just one output and go straight from signal reception to reaction. Imperative signals are signals that when received with other signals lead to a different action than they would when received alone. It could be that the imperative and indicative nature of a signal comes in degrees – the more signals that can be received before taking action, the more indicative. But it seems more work needs to be done in this area.

Grice is also famous for his *cooperative principle* and a distinction between what he called *utterance meaning* and *timeless meaning*. The basic idea behind the cooperative principle is that for communication to work, speakers (senders) must typically observe four particular maxims of conversation. The first maxim is *quality*, according to which one is supposed to say only what is true and backed by evidence. The second is *quantity*, where the aim is be as informative as required and no more or less. The third is the *maxim of relation*, which amounts mostly to making sure what you say is as relevant as possible. And the fourth is the *maxim of manner*, which amounts to being as clear and brief as possible.

The distinction between utterance meaning and timeless meaning has to do with what a speaker means by a signal in some particular instance and what the signal means conventionally. Timeless meaning is supposedly built from utterance meaning. After using a signal a certain way enough (utterance meanings), it develops a conventional meaning (the timeless meaning). Once there's a conventional meaning, speakers can notice this and then use it to their advantage - for example, to lie or to make a joke.

How does all this look from the point of view of the sender-receiver model? The model doesn't have anything explicit to say about these maxims, but I can see how they might fit in. In the standard cases, it seems fair to say that these maxims are followed (or at least not violated).

The agents tend to learn to send the signal that is true or for which they have evidence (*maxim of quality*), the signal that is most informative (*quality*), the signal that is most relevant (*maxim of relation*), and they do so in a straightforward manner (*maxim of manner*). Of course, again, these are stripped down models. With elaboration, exceptions will emerge. An example here is a recent paper by Martínez (2015) showing signaling arising and being maintained despite what appears to be continual deception. And in fact, Grice himself noted that these maxims were not meant to be followed perfectly in all cases.

How about the utterance and timeless meaning distinction? This seems to fit into the model to some extent too. Signals will have a conventional sort of use – a maintained pairing of inputs, signals, and outputs - and this use will be determined in part by past and continued uses. Once a conventional use is in place, senders might be able to exploit this in creative ways, using a signal to mean in some other context something other than what it means conventionally. The timeless meaning of a signal will roughly be the conventional pairing of sender and receiver strategies for that signal. Utterance meaning of some particular use of a signal will roughly be the pairing of whichever sender strategy is at play in that instance with whichever receiver strategy would give the "right" payoff given that strategy. I'll elaborate on these ideas a bit more in a slightly different form in the next few sections.

There's much more that could be said about meaning here and about the details of Grice's program. But I'd like avoid going into the very nitty gritty details and tangential debates and stick to the more general picture since that is what I am most interested in examining here, and we don't need to go into all the analyses out there of the minor details to do that. What I'd like to do now is set meaning and related issues aside for just a moment and focus briefly on

what is the most recent comprehensive re-imagining of Grice's framework, and one that offers

up an interesting twist.

1.2.3 The Ostensive-inferential Account

In his 2014 book *Speaking our Minds*, Thom Scott-Phillips articulates a new version of the

Gricean model, and one that he at one point explicitly sets up against the sender-receiver view.

I'll follow Scott-Phillips in calling his model the *ostensive-inferential model* of communication.

I know the general Gricean view is sometimes referred to this way, but I will use the term from

here on to refer only to Scott-Phillips's particular version of it.

On the face of it, it might seem the ostensive-inferential view is similar to the sender-

receiver view. Here is Scott-Phillips' basic account of communication:

> …what makes an interaction communicative is that it involves two behaviors, a
>
> signal and a response, which both possess two particular qualities. The first is
>
> interdependence: as I have emphasized, signals require responses, and responses
>
> require signals. The second is design: the two behaviors must be designed to
>
> interact with one another. In sum, then, communication is a matter of *designed*
>
> (or *functional*) *interdependence*. This quality is the essence of communication…
>
> (2014, p. 33)

Yet in the same book, Scott-Phillips goes on to criticize the sender-receiver model as being an

instance of what he calls the *code model* of communication, a model that he says differs from the

ostensive-inferential model and cannot account for important features of human language.

Ostensive-inferential communication works like this. Two intentions in particular are important: (1) an intention that my audience recognize I am trying to communicate something to them (this is called a "communicative intention"), and (2) an intention that they recognize what I am trying to communicate to them (this is called an "informative intention"). An example goes as follows: Josh and Max order burgers at a restaurant and Josh receives his burger first. Josh smells his burger and it smells odd to him. He wants to communicate this to Max, and so Josh takes a sniff of the burger in a rather exaggerated way, perhaps scrunching his nose following the sniff. This does two things for Max: (1) it shows Max that Josh thinks the burger smells odd (the informative intention), and (2) that Josh wants to communicate this to Max (the communicative intention). This example is based on one involving berries due to French cognitive scientist Dan Sperber and British cognitive scientist Deirdre Wilson who together presented the first version of this rendering of Grice in their 1986 book *Relevance: Communication and Cognition*. This sort of communication is supposedly important because it allows for more creative on-the-fly communication such as the burger case - using an exaggerated sniff and scrunching one's nose to mean roughly, "This food smells weird" rather than just saying it (in, say, English). It's called ostensive-inferential because senders try to communicate in part through ostension - showing, pointing out, exhibiting, providing some form of evidence for what they mean – and receivers try to understand senders via reasoning about what senders did and the context in which it was done.

For Sperber and Wilson a *principle of relevance* and two sub-principles of *communication* and *cognition* replaced Grice's cooperative principle. According to the communicative principle, senders tend to say something only if it is relevant, and they say what is most relevant. So if I ask you if there is a gas station down the road, and there happen to be two (Cressman's and Shaver Lake Gas) but only one is open (Cressman's) and you know this,

you reply with "Yep, just a quarter mile down is Cressman's" rather than telling me "Yep, Cressman's and Shaver Lake" or just "Yep, Shaver Lake". According to the cognitive principle, receivers tend to pay attention to what is most relevant and interpret signals in the most plausibly relevant way. So, when you say "Yep, Cressman's", I interpret this as meaning that there is a gas station down the road and that it is open. I won't spend much time on this idea, but these principles seem to fit into the sender-receiver view too. In cooperative signaling games, agents who develop successful languages seem to be sending the relevant signals given the state of the world and the receivers seem to be interpreting signals in the most relevant way, performing the relevant action. Agents in a sender-receiver model could even have cognitive machinery added that pushes them in these directions to greater or lesser extents. But whether some sophisticated cognitive capacity such as an innate version of the principle of relevance is needed just to get any form of communication off the ground at all, given the evidence of cases like that of the fireflies and other simple models, seems doubtful.

In contrast to the ostensive-inferential model, the code model does not have intentions at its core but instead involves a system of overlapping fixed rules of sending behavior for senders and receiving behavior for receivers. [31] What matters is the association of inputs, signs, and outputs, and it doesn't matter how those associations got there – learning, natural selection, or rational choice.

> Communication of this sort depends upon mechanisms of association. In
> signalers, certain states of the world are associated with the production of
> particular signals; and in receivers, the reception of those same signals is

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[31] Scott-Phillips notes that the name "code model" appears to originate from Sperber and Wilson (1986).

associated with particular behaviors. In fact, this associativity is the defining

feature of the code model. If communication is made possible by associations, it

is, by definition, an instance of the code model of communication. (p. 5)

Scott-Phillips thinks the sender-receiver model is a clear instance of this sort of set-up, the code

model, and I am tempted to mostly agree with him. I will say that I think it should be obvious

that there are differences between the sender-receiver model and the rough sketch of the code

model that has been put forward, and more differences should become obvious as we go along.

But for the sake of argument I'll go ahead with the idea that the sender-receiver model is roughly

an instance of the code model, and I hope readers will see that the similarities are relevant

enough and the differences small enough that my argument goes through.

So, why is it a problem that the sender-receiver model is a version of the code model?

One reason, Scott-Phillips says, is that the code model seems unable to handle instances of

communication that are seemingly inexplicable in associative terms. Consider a case he presents

in his book:

> …suppose that a couple have had a number of conversations about, say, a
>
> particular TV show, which many people think is brilliant, but which they both
>
> agree is terrible. Now suppose that they head to a party one evening, and a friend
>
> of theirs starts telling them how great he thinks the show is. The friend then
>
> leaves the conversation. One half of the couple wants to acknowledge to the other
>
> half that this is just the sort of thing they had been talking about. To do this, she
>
> can improvise and use an indefinite variety of behaviors: a raised eyebrow; puffed

cheeks; a glance over her shoulder; sticking her tongue out; and many others...

(p. 7)

Why is a case like this supposedly a problem for the sender-receiver model? The next line of the quote gives us our answer:

…There is no code in operation here: none of these behaviors is conventionally associated with her intended meaning, even probabilistically. (p. 7)

The idea is that the puffed cheeks cannot possibly be a code since they are not associated with inputs and outputs as signals in a sender-receiver system are. I think Scott-Phillips is somewhat right and somewhat wrong on this one. The cheeks certainly are not associated with perhaps a very precise meaning such as "Oh, my gosh, Hugo thinks *Games of Thrones* is great, we were just talking about this!" But it does seem to be the sort of thing that could be associated in certain contexts with a broader, less precise meaning perhaps such as "Did you hear that?!" Consider again the burger example. There are many other things I can imagine Josh doing other than scrunching his nose when he emphatically smells his burger that would work well in getting the same idea across to Max. He could pretend to gag; roll his eyes back; pretend to hold back vomit; stick his tongue out. The list goes on. But notice that these actions do tend to be used to communicate these sorts of things in similar contexts – that's partly why it's easy for me to imagine him using them for this purpose. If you doubt it, just watch some old cartoons. It's hard to understand Tom and Jerry if you don't understand associations between certain acts of so-called body language and certain contexts, inputs, and outputs. Movies with little or no dialogue take advantage of the same body language associations. If Josh sniffed his burger then smiled wide, or blinked his eyes five times, then it would be much less likely, I suspect, that Max would

think Josh was complaining about his burger. They may be subtle, but associations are there. When they are not, then communication is sometimes unsuccessful, especially in one-off or first try circumstances. But when a first try or one-off attempt is successful despite no previous associations – imagine Josh doing the five blinks and it working - then perhaps we can think of this as a lucky meeting of sender and receiver rules that senders and receivers in that game might or might not go on to reinforce in future interactions (if there are any). I say lucky because it seems fairly miraculous to me that Josh would get "This food smells weird" out of an emphatic sniff and five blinks or a wide smile.

Another objection Scott-Phillips raises to the code model is that it fails to deal with *underdeterminacy*. Underdeterminacy is the idea that even given a seemingly straightforward utterance such as "It's sunny outside", there are an infinite number of things that utterance could mean (in the speaker meaning sense) other than what that utterance seems to mean literally. For example, I might say "It's sunny outside" in response to someone asking me "Should I bring my sunglasses?" Here the speaker meaning of "It's sunny outside" might actually be "Yes" – since that is basically what I'm trying to tell them "Yes, you should bring your sunglasses" and yet that is obviously not the literal meaning of that English sentence I uttered. So why is this supposedly a problem for the code model, for the sender-receiver version in particular? I will quote Scott-Phillips again:

> One consequence of this fact is that the linguistic code cannot make linguistic communication possible. The existence and ubiquity of underdeterminacy means that the meaning that a speaker intends when they produce an *utterance cannot ever be determined by analysis of the literal meaning of the utterance alone. In*

short, linguistic utterances are, on their own, unable to specify speaker meaning,

and hence they logically cannot make any sort of communication possible

[emphasis added]. (p. 17)

What Scott-Phillips is getting at here is that communication cannot get off the ground if receivers cannot determine what the speaker is trying to communicate. And he is arguing that the literal meanings of signals alone, due to underdeterminacy, don't allow a receiver to figure out what a speaker means and so engage in successful communication. My response to this is the following. Consider the simplest sender-receiver game. I think we can think of this game as one sort of stripped bare and idealized. One of the things it is stripped bare of is things like shifting contexts.[32] In the simplest game, we don't have to worry – as with the sunshine example - about whether a certain type of signal is being sent in a different context. All that needs to be paid attention to by receivers is the literal (or in this case: conventional) meaning of the signals – and in fact, that's all there is for them to pay attention to in these cases. And here, in this simple game, communication of a sort *does* get off the ground and can do so in a number of ways described earlier this chapter. So, it seems it can't be that linguistic utterances "logically cannot make *any* sort of communication possible" – at least not if we count the meaning of a signal in a sender-receiver system like this as an instance of a linguistic code. Of course, as we saw earlier in this chapter, conventional meaning *evolves* along with a signaling system – systems don't start

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[32] In a sender-receiver game, we can think of contexts as different states. Suppose I have two signals available (A and B). And there are 4 possible states of the world. I might send A in states 1 and 2 and B in states 3 and 4. It might be that in state 1 the action a receiver should perform is different than the action they should perform in state 2. And so, what A means in the "context" of state 1 will be different than what it means when sent in state 2. Perhaps this is easier to see if it turns out that states 1 and 3 are almost always the states encountered and states 2 and 4 are very rare – I'll say more about this idea later in this chapter. It could also be that there was originally only a 2 state signaling game, the signaling system developed along with the meanings of the signals and then two new states were added and the signals – with their conventional meaning – now had to be used to coordinate interaction in these new states (i.e. contexts). There are many ways the idea of contexts might be modeled with the sender-receiver model.

with signals with conventional meanings - so I can see how if we interpret things this way, perhaps there is another sense in which conventional meaning cannot make communication possible, namely that that sort of meaning is a *product* of the system coming into equilibrium rather than something that was around before equilibrium that helped bring the system into it. In that case, Scott-Phillips would be right but not for the reasons he has given.

Another thing the simplest model is stripped of is the ability of senders to do things such as use sarcasm. Suppose we add that to the model. Now when a signal is sent it might have a combinatorial nature: one part original signal (some part of English, say), one part added sarcasm. From the point of view of the sender-receiver model, this combinatorial signal could be considered a single larger signal in a larger (or meta) language (or signaling system) that combines the literal meaning of English utterances with the presence or not of sarcasm, and it could have associations (likely probabilistic and dependent upon circumstances) to inputs and outputs just as signals do in other sender-receiver set-ups. If we look at the signal that way, then it's not true that the literal meaning of the *larger* (meta) signal cannot pin down meaning in a signaling game. But it will still apparently be true that in these sorts of games with these extra features added that the literal meaning of component signals, where one of those component signals might be some part of English or some other spoken or written language, won't pin down speaker meaning on their own. Whether sarcasm evolved along with literal meaning or whether there was simple linguistic code first and sarcasm was added on later is an interesting question but unfortunately one I will not address here.[33]

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[33] For one example of a model dealing with complex combined signals see Barrett (2009). My suggestion here is that there might be a sort of "code" for sarcasm.

Perhaps it comes as no surprise given what Scott-Phillips thinks about the code model and underdeterminacy that he also argues there must have been a sort of transition involved in human language use. As he sees it, since a code model of communication suffering from underdeterminacy could not get human language off the ground, it must be that ostensive-inferential communication came first, then using ostensive-inferential communication we constructed languages, conventional codes, which were then added to the already existing framework of ostensive-inferential communication, the result being what is essentially ostensive-inferential communication augmented by a linguistic code. On page 46, Scott-Phillips puts it rather simply:

"…ostension and inference are logically prior to the linguistic code."

On page 19, he writes:

"…a language is the rich, structured collection of conventional codes that augment ostensive-inferential communication within a given community."

This is a fairly radical image of the nature of human language. Language is still a code on this model, a signaling system, but one that is used as a sort of complex additional tool by agents who primarily rely on a prior existing system of ostension and inference. Scott-Phillips thinks animals and smaller creatures have codes too in the signaling system sense, but that the difference here is that unlike humans, other creatures do not operate on an already existing framework of ostension and inference – this is part of the explanation for why they cannot use their code in a creative way – say, for example, using an existing code in a new way in order to make an implication or to express sarcasm.

I think Scott-Phillips's general picture of the nature of language is rather attractive but ultimately off the mark, and I think the error stems from a misunderstanding at the very start of things. I already tried to show this to some extent when, while responding to his criticism about underdeterminacy, I pointed out that at least primitive signaling systems still evolve despite only having basic conventional meaning and no ostensive-inferential use seemingly going on – and remember: these models have been applied to even things like fireflies and cells. I suspect Scott-Phillips wouldn't be satisfied by this response, though I admit that at the moment I cannot think of what sort of reply he might make. So instead I will try to give another response.

We can look at the same problem from another angle. Consider what Scott-Phillips accepts as instances of ostensive-inferential communication:

"Tilting your coffee cup is ostensive but not linguistic, since the tilt does not (really) have a conventionalized meaning." (p. 20)

"…languages differ to other, simpler cases of ostensive-inferential communication, such as *points, non-linguistic vocalizations, nods of the head, and so on* [emphasis added]." (p. 20)

Earlier the puffed cheek example also mentioned "eyebrow raises". These things – pointing, head nods, tilts of glasses, raised eyebrows – are said to count as parts of the "already existing system of ostensive-inferential communication" (p. 18). But what if it turned out these were actually instances of the code model too? What if the best examples of non-linguistic ostensive-inferential communication turn out to be instances of sender-receiver communication? Consider

pointing.[34] We might take it as a more or less obvious axiom that humans understand intuitively or at some "deep" level what pointing means, but why do that? It seems that pointing is something that should also have to go through some process of back and forth as described in the sender-receiver model for us to understand what it means. How am I to know what you mean by pointing at something if I've never seen someone point at something before or if there isn't some evolved response nudging me in that direction? The same goes with head nods or eyebrow raises or fixing your gaze in a certain direction. Just to be clear: what I am imagining here is a reconceptualization of apparent primitive instances of ostensive-inferential communication as themselves instances of sender-receiver communication. But this sort of move is not without precedent as others have noted worries about pointing, especially in regards to its use in the theory of language developed by American philosopher Willard Van Orman in his book *Word and Object* (1960). To get someone to understand that I mean "cat" when I say "*oogboog*" I might point at a cat each time I say it and only say when a cat is around. But for my pointing at the cat to be a helpful clue to a receiver, they need to already understand what it means when someone points under those circumstances, and so there is a sort of signaling game problem here as well. A similar story could apply to raising one's eye brows or using a fixed gaze to call attention to something. These sorts of transitions could also have occurred in the time of our not so distant ancestors but distant enough that there were no intentions involved in making them.

This problem goes all the way to the start of communication. Even the most "intentionally overt" communication faces this problem. For me to recognize a communicative intention in you there must be something clueing me in to it. If it is a certain kind of gaze, or

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[34] One might think the best examples are really the more improvisatory ones. If that's the case, I would suggest looking back to what I said about the case involving Josh and the burger.

eyebrow raise, or tone of voice, or even a mix of things, I'm still going to have to have learned that. There will have to be a back and forth before we have a real back and forth. I'm going to have to learn your signal for "I'm trying to communicate".

Scott-Phillips might try to defend his general view by pressing on the claim that humans in fact do have the sort of complicated intentions his theory calls for and that non-humans don't, and so there must be some fundamental difference between human language and animal communication. But if the sender-receiver view can cover both the animal and human cases and the complicated intentions he mentions don't seem to call for a difference from the point of view of sender-receiver model, it's hard for me to see the call for a difference as anything but question begging. Again, we might decide to say that there is *some* difference – that in the case of humans there are often *more complicated intentions* (if we want to use that language) in the background of the goings on – but to say that because of this our communication counts as *real* language or communication and non-human communication is of some fundamentally different kind, seems wrong.[35]

1.3 Robinson Crusoe and the Wine

I'd now like to look at some of the finer details of the sender-receiver model, some of the foundational issues. Peirce's model didn't obviously involve two agents – a sender and a receiver – but Grice's view and the ostensive-inferential formulation of it seemed to. The

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[35] But what if it is merely claimed that the *difference* is distinctively human? That is a different question and one that would require more research into the communication of other animals to see if it really is a difference that applies only to humans. But even if it does turn out to be a difference unique to humans, it would still not mean that human language is real communication and other animal communication not.

sender-receiver model assumes it takes two to tango, but does it? First, let me say that we are not asking whether information can be carried by things other than signals, for example, by cues – that it can is clear.[36] We are also not asking whether receivers on their own can pick up information from things like cues. We are asking whether *communication* requires two. I think the answer is simpler than most want to believe. Yes, it requires two. That's just what communication is – it's sort of analytic, true by definition. It's a thing done between two or more people or organisms (or agents of some nature).

But a way to approach the same question that also has a chance of persuading skeptics is to think about the hard cases, the cases somewhere on the borderline. Consider what's known in the literature on Grice as the *soliloquy objection* – originally due to American artist and philosopher Paul Ziff (1967). What do we say about the lone speaker (sender) who seems to say something when no-one else is around? Do we call it communication?

I find it hard to think about cases like these in the abstract. So, let's add just a few details to the picture. Suppose our speaker is a Robinson Crusoe type. He was raised in English society but after a series of tragedies at sea has been stranded on an island and is now in some sense alone (although people are still out there somewhere across the ocean). He writes a note, puts it in a bottle, and drops it in the ocean. Is this a case of communication? My inclination is to agree in the case that Crusoe intended as his audience someone across the ocean and there is some chance receivers could receive and react to his signal. But suppose now that unknown to Crusoe everyone has died – he's the last man on earth, even in existence. Is this communication? I take it some Griceans will still want to say yes given the sender's intention, they will say that it has

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[36] I discussed the difference between signals and cues earlier. Roughly, cues are signs that carry information about states but involve no sensitivity to feedback (and so, no adaptation of sender rules) on the sender side of the model.

speaker meaning. I'm somewhat inclined to agree that it might be fair to describe it as having

meaning still in some sense since in our example the speaker is also trained up in a language

already. Yet it's much like plucking the receivers out of a game in which a signaling system has

already evolved and in which the sender has already settled on rules. Is his signal an instance of

communication out of that old context? I'm not sure. It's an attempt perhaps, but not a

successful one. It takes two to tango and there aren't two anymore.

A famous real-world example of this sort of situation is found in the case of the Kauaʻi

ʻōʻō bird (*Moho braccatus*), a native species of the Hawaiian island of Kauaʻi. An American

ornithologist, H. Douglas Pratt, Jr., captured what is thought to be the mating call of the last

living Kauaʻi ʻōʻō bird, a male, who died in 1987 (Steensen, 2018). This bird's mating call was

the swan song of its entire species. The Kauaʻi ʻōʻō bird's call is the result of a mix of back and

forth on the evolutionary level and on the learning level, as is the case in most bird species. The

last Kauaʻi ʻōʻō was trained up in the signaling system of its kind. And yet, there were no

receivers left to hear his cries. Were his signals actually signals? Actually communication?

Was he communicating anything? Again, I'm not sure. He sure seems to be trying, and he was

trained up. But as I said, it seems to take two to tango. It doesn't seem right to say that he

communicated *successfully*.[37]

Go back to the island. Now imagine there has been no previous signal use by the sender

– perhaps he grew up alone somehow on the island or is a "swamp-Crusoe" (he's a perfect exact

copy of Crusoe that just magically popped into existence).[38] The man goes to do what appears to

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[37] To hear Pratt's recording of the Kauaʻi ʻōʻō, see Pratt (1975).
[38] This is a reference to Donald Davidson's Swampman character introduced in his 1987 paper "Knowing One's Own Mind."

be the same thing as before: he makes marks on paper, puts it in a bottle, and drops it into the sea. Maybe the marks on the note in the bottle even look like the English sentence "Is anybody out there?" Perhaps there is an audience or not but he intends that someone receive it. Is *that* communication? I don't know. Is that scenario even possible? I have a hard time with abstract thought experiments such as these. Would such a man even know what he is doing? Could he intend to communicate if he has no idea whether he's the only one around and has no evidence of anyone else, has never seen anyone communicate before, etc.? My stance is that these cases carry some of the components of the standard cases and that some are closer to, some farther from, the standard examples than others. I think the everyday concept of communication is probably not as clear as some philosophers would like it to be and that it probably didn't come about originally with handling these sorts of cases in mind. Further, communication evolves over time. We should expect that in most cases there will be *in-between* stages, especially during the move to stabilization and that even seemingly stabilized systems may change someday. Peirce seems to have thought this sort of thing too (Short, 1996). There is a sense in which often meaning isn't fixed rigidly.

What about the cases where Crusoe talks to himself or doesn't intend an audience? The first case, I think, we can at least sometimes see as communication. I might play the role of both sender and receiver – as in the case of memory. For example, I might write a note to myself. Cases where I'm not intending to talk to myself or anyone else – where I don't even think there is possibly some god or alien species out there who might hear me - I think are best simply not described as communication. Though, what's really going on in those non-communicative cases I'm not sure – an odd tick, relieving stress, trying out a new behavior. All this is to say that the

answer to the question of whether it takes two to tango is basically yes, but with a few qualifications.

Here's a final consideration before we move on to deeper waters. How far does the borderline go? Just about anything can be used as a signal. I could use a glass of wine that I hand you as a signal.[39] Suppose we have a game where I can either hand you a glass of wine or a glass of water. You drink whatever I hand you. If I hand you wine in one situation, it's great for both of us – perhaps because the more you drink, the more entertaining you are to me and me to you. If I hand it to you in the other, it's bad for both – perhaps because now we want to have a serious sober conversation. The converse story applies to the water. We get a system going and it perpetuates, I giving you wine in one state and water in another. Is this signaling? I want to say no, and this is because the physical effect (the causal consequence) of the so-called signal on the receiver (drunkenness, soberness) and our enjoyment or not of the effect is what is really doing the maintaining work of the system, not what is done with the information the object contains. In fact, the receiver doesn't do anything with the information the wine contains - he drinks just the same. A similar case, but one that counts as signaling, involves me throwing either a red or blue ball to you and you placing it in the right bucket for a payoff. There, although you are also physically using the signal (putting it in some bucket or other) you are first using the information you receive from it (via color) to decide what you do next (which bucket to put it in). As with other cases, I say the same with these. There will probably be cases somewhere on the borderline, shades of grey. Most cases won't be clear-cut and paradigmatic.

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[39] Thank you to Cosim Sayid for this question. Godfrey-Smith (2014b) brings up a similar worry and offers a brief sketch in this direction.

1.4 Meaning

We've covered just about everything that can be covered as far as the basics of the sender-receiver way of looking at things goes. But one thing we have yet to discuss at length is the *meaning* or *content* of signs. We talk about meaning all the time: the meaning of words; the meaning of sentences; the meaning of a wink; even the meaning of the flash of a firefly. What counts as the meaning of a signal?

One way to approach the problem is to look at the *information* in a signal. Fred Dreske's (1932-2013) *Knowledge and the Flow of Information* (1981) is a classic example of this approach.[40] The most recent version of this idea, however, is due to Brian Skyrms. On Skyrms's account, the *informational content* of a signal is captured by how the signal *changes* both the probabilities of the states of the world and the receiver's actions. On this view, you can think of the content of a signal as a sort of list of all the changes to the probabilities of the states of the world and actions of the receiver given the signal.

$$<[P_{sig}(\text{state }1)/P(\text{state }1)], [P_{sig}(\text{state }2)/P(\text{state }2)], [P_{sig}(\text{state }3)/P(\text{state }3)]>$$

Figure 1.9. An example of an informational content vector for a simple game with three states and three signals (receiver actions are not included here). P_{sig} is the probability of the state conditional on getting the signal.[41]

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[40] I will not look at Dretske's view as it is well known there are many problems with it.

[41] Skyrms actually prefers adding a logarithm of base 2 to his equation, making his preferred representation of informational content look like this: log $[P_{sig}(\text{state }1)/P(\text{state }1)]$. Doing this allows for measuring information in *bits*.

Godfrey-Smith (2012) points out a couple potential flaws with this view, but just consider a simple case of deception. Hunters sometimes use fake elk bugles to lure in large bucks. Intuitively we want to say that the bugle sent by the hunter is false, is a case of deception, and yet it appears that Skyrms's account doesn't allow for this. The change in probabilities of the hunter having been the one who sent the signal will be part of the list, and so, the signal will be true and have the same content when sent by either sender (the hunter or the elk). Let E_1 represent the state where there is an elk present and let H_2 be the state where there isn't an elk present but rather a hunter and you get this informational content vector:

$$<[P_{sig}(E_1)/P(E_1)], [P_{sig}(H_2)/P(H_2)]>$$

Figure 1.10. The elk bugle vector.

Whether the signal is sent by the elk or the hunter, the vector *is the same*, the content is the same.

The point is somewhat easier to see with a similar formulation that faces the same problem. Suppose the content of the signal is simply a list of the probabilities of the various states of the world given the signal.

$$[P_{sig}(state\ 1), P_{sig}(state\ 2)]$$

Figure 1.11. Simple probability vector.

Then what both the hunter and the elk "say" when they send that signal, again, will be the same. Suppose that 10% of the time a hunter is the one who sends the bugle. Then the informational content of that signal will be something like "Hunter 10%, Elk 90%". Sent by either type of sender – hunter or elk - a signal with that content will not strictly speaking be a lie.

Another way philosophers have approached the question of meaning is to look at the *success* conditions of signals – roughly, when they work or have utility. American pragmatist William James (1842-1910) sometimes seemed to pursue such a view.[42] Later, Ruth Millikan developed an evolutionary version of this general idea, where the content of a signal is determined by natural selection. Millikan's view is very similar to the sender-receiver view. There is a sender (a producer) who observes the world and sends a signal and a receiver (consumer) who receives the signal and performs an action. According to Millikan, roughly, the content of a signal is determined by the "normal" combination of states and actions that led to the preservation or proliferation of that particular signaling strategy, where what "normal" meant was somewhat unclear and often debated. The most recent version of this way of characterizing content is due to Nicholas Shea, Peter Godfrey-Smith, and Rosa Cao (2017). Here, the same idea applies but more broadly. Content is produced by various processes – learning, copying - not just natural selection. What matters is which states figure in the explanation of the stabilization of sender and receiver strategies.[43] So, whereas with Millikan, if the combination of a sexually receptive female firefly being around and a male firefly going in to mate preserved and proliferated via natural selection that signaling strategy, then the content of the signal involves just those states and acts, on the Shea, Godfrey-Smith, Cao view, this sort of analysis also applies to cases like that of the vervet monkey signaling system or even human signaling where the signaling strategies are preserved and proliferated via feedback mechanisms such as reinforcement learning, copying, and other processes.

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[42] *Pragmatism* (1907) and *The Will to Believe and Other Essays in Popular Philosophy* (1897) are the most popular examples of James's work in this tradition.

[43] See Martínez (2015), for a formalization of the notions maintaining and non-maintaining.

The Shea, Godfrey-Smith, Cao version of the theory does a nice job of generalizing Millikan's key insight and showing that a theory of this sort can cover more cases of communication than previously thought. However, consider another case involving the elk.[44] The elk eventually learn to recognize the smell of wolves and develop a signaling system for warning the others of a wolf's presence. Now if an elk smells a wolf, it will send an alarm for the others. The functional content seems to be something like "Wolf!" But now suppose a hunter wearing his new wolf pelt and looking for a new buck for dinner comes along.   An elk smells it, sends the alarm, and the herd escapes. This seems to be a maintaining use of the signal in some sense. If the signal were used this way more often, it's not the case the signaling system would break down – this use would get reinforced. And yet, intuitively the hunter doesn't seem to be part of the signal's content.

It's not clear what move to make from here. Does one reconstruct the content somehow so that it covers both the wolf and the hunter wearing wolf pelt? Does the history matter – was perhaps the first use in the hunter case a happy yet false accident but such that if it became more common it would later become part of the meaning? Should we try to rely on some notion of "normal"? But what counts as normal? What if it just happened to be that the hunter wearing a wolf pelt was the first threat the elk encountered and then wolves became the norm after that? Part of the answer, I think, is to go back to what was said by Peirce about meaning evolving over time. But I think there's more to it than that.

In *Convention,* David Lewis handles the question of meaning in a different way. There he writes while summarizing the Revere case:

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[44] This is adapted from a story in Harms (2010).

I have now described the character of a case of signaling without mentioning the meaning of the signals: that two lanterns meant that the redcoats were coming by sea, or whatever. But nothing important seems to have been left unsaid. So what has been said must somehow imply that the signals have their meanings. (pp. 124-125)

Lewis seems to be saying, "Look, we've now got an account of communication, and since meaning is a part of communication, it must somehow fit in here. And yet, the notion of meaning doesn't seem to fit in so nicely, and somehow that doesn't seem to be a problem, that we can still just as well talk about things in terms of the model, no meaning talk necessary". It's a very deflationary sort of view. I want to take a similar line, but slightly different. The common, everyday notion of meaning – the one we use in everyday speech - is handed down, imprecise, and unclear. It seems likely not to have originated with handing all the possible bizarre and borderline cases in mind. This doesn't mean using the old ordinary way of speaking about things having meaning won't still sometimes be helpful or easier in certain contexts, just that it might be less useful in more rigorous scientific ones. It also doesn't mean that the old way of speaking about things - saying something means X or Y - is wrong or false. These are just two different ways of talking about the same phenomenon.

Some might think perhaps we can reduce one way of speaking to the other. I don't think we should expect to be able to do that, to find a perfect or even nearly perfect reduction of the old everyday on-the-streets notion of meaning to something going on or some property of signals in the new more scientific sender-receiver framework, a reduction of one way of speaking about things to the other. In *Thought in a Hostile World* (2003)*,* Australian philosopher Kim Sterelny

articulates basically the same view in different terms. Sterelny talks about what he calls the *Simple Coordination Hypothesis*. On the Simple Coordination Hypothesis, the notion of meaning is supposed to be reduced to some specific connection property of the wiring and connection facts in a communicative system. Like Sterelny I don't think such a property – success, function, etc. - is to be found. My stance is a sort of "levels of explanation view" like that expressed by American philosopher Daniel Dennett in his 1978 book *Brain Storms,* but not quite the same thing. The handed down way of speaking and the new sender-receiver framework are two different ways or levels of talking about the same topic – communication and meaning. Neither way of speaking is right or wrong in itself, just more or less useful in one context rather than another – the handed down way in normal everyday conversation and the sender-receiver way in more rigorous precision-requiring scientific ones. They are just two different signaling systems. Whereas others hold out hope that the handed down way of speaking will eventually be fully captured and explained by a new way of understanding things, and others that it will eventually be explained away (see perhaps Churchland 1986), I have my doubts.[45]

1.5 Coda: If a Lion Could Speak…

Wittgenstein famously stated that if a lion could speak, we could not understand it (1953, Book 2, line 327). In his book the *Tractatus Logico-Philosophicus* (1922), he writes "The limits of my

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[45] In a forthcoming paper, Godfrey-Smith and Ronald Planer come to a somewhat similar deflationary conclusion, though apparently for different reasons. Their main motivation for taking a deflationary stance toward meaning seems to be the observation that functional and informational content don't always align and that different kinds of "involvement" a sign has with the world might be important or not at certain times.

language mean the limits of my world" (Proposition 5.6). Is there anything to the basic idea expressed in these remarks? I think there is.

Recent modelling work by Jeffrey Barrett at the University of California, Riverside (2007, 2010) offers some insight into the different kinds of incommensurability or non-translatability possible between different signaling languages. I won't go into the details of all the cases Barrett covers. But suffice to say that even languages with the same resources – the same number of signals, atomic states, actions, senders and receivers, the same preferences over states, and even the same mechanisms of reinforcement - can end up carving out the world in incommensurable ways, in ways such that there is no perfect translation of all the atomic or compound parts of one signaling system into another. When there are differences in any of these things – preferences, which states agents can observe, how they learn to signal, how adaptive they are, and so on - incommensurability of some sort is not uncommon.

And yet, as Barrett points out, there can still be truth *within* respective signaling systems, which are still going on in the same world, on the same planet, despite what is true for the sender and receivers, even what *exists* according to their systems, being different. One system might distinguish between blue and green, one might not (might lump them into one category: "Bluish"). One population of agents might be able to see and so communicate about ultra-violet light, and another group might not – or might be able to see ultra-violet but just not care about it and so lump it together with something else. An agent can still say something true in their system when they say, for example, that some object is "Bluish", even if bluish or blue or green aren't things that an agent in a different signaling system even acknowledges.

This is a sort of *internal-external* distinction type take that Barrett is going with here. That distinction was introduced by German philosopher Rudolf Carnap in his 1950 paper "Empiricism, Semantics, and Ontology". The basic idea is that there is a difference between making claims *within* a language using the ontology of that language – so saying, for example, "There's a lion over there!" – as compared to instead talking *about* that language and its ontology, the way it carves things up – so saying, "Are lions a thing? Should we use a language that treats them as real?". Barrett seems to be suggesting we just not worry about the external questions, not worry about if our ontology is the *correct* one or true one with a capital T. He seems to think the more practical thing to do is worry about whether our language satisfies our needs or not or does so better than some other language.

Barrett's argument for this is pretty simple. One might think the success of a signaling language is a good indication of its being a true description of things. And yet, different signaling populations can have languages that carve up the world differently and still be successful for their respective agents. The same population can even use different languages, with different ontologies, over time – just think of the history of science. As Barrett (2007) points out, it seems that the only way we'd have a good reason for thinking our particular language (and not some other one) got the deeper ontology of the world right is if we knew that the kind of success in communication and coordination we currently enjoyed thanks to our language was possible only if our language actually carved reality at its joints. And yet, like Barrett, I don't see how this is something we could actually check. We can't step outside our respective languages (signaling systems) to see if the way they describe the world is true and matches up with reality – our signaling systems in a way are our reality. The states in them and the way the agents carve them up are the only states our agents can see and talk about. For our

agents to look "outside" the game would be to now be able to see new states and so now be in a *new game*, have new things to talk about, a new ontology.

There are other considerations against the view that the success of some signaling system is a good guide to reality. As Barrett (2007) points out, it seems to be part of the nature of scientific and philosophical inquiry to always search for improvement. It's hard to see there being a point when we'd feel safe saying things have finally settled, that our language is as full and successful as it gets and that there will never again come a day when we might possibly improve upon our description of things.[46]

A little caveat is appropriate at this point. The way I've been talking about *truth* here has been a bit unusual. It probably will come as no surprise that I think the notion of truth in signaling systems is going to have to be a bit deflationary. We saw that there are many kinds of "content" or "meaning" people have looked to in signaling systems. In the previous section of this chapter, I took the stance that there probably isn't a single ground for our handed-down everyday notion of meaning to be found in the new model. That, I take it, would also rule out a traditional account of truth. A signal would have to have a meaning to be true or not on traditional accounts. No real meaning, no real truth (or falsity). This issue aside, consider also that signaling systems cover not just simple signals about states of the world. There are also cases of signals that are more imperative in content than indicative, have more of a "command" function to them than a descriptive one. When I yell "Run!" at the wrong time I'm not saying something false. Similarly, when I say it at the right time, I'm not saying something true.

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[46] There is also the possibility of something like Peirce's notion of truth "in the limit" fitting in here. See Peirce (1878), for an introduction. Looking into this would take us onto a bit a detour, however, so I'll save that investigation for another project.

Signals can still be, for lack of better words, "appropriate" or not – just as they can be "true" or "false" when sent in certain states of a game. Some signals might be somewhere between, containing a mixed content that is both indicative and imperative and so is true and appropriate at the same time, or perhaps even has some other content mixed in. Some signals might be more aptly described as more or less "accurate", not just true or false – calls encoding predator distance for example.[47] Either way, truth, as philosophers usually talk about it, like meaning, won't survive in this model looking exactly the usual way.

OK, but what does all this tell us about the lion? I think it's fair to say that the lion will have different actions attached to the receiver side of their signals than us – for example, running for lions involves four legs not two, they can extend and retract their claws, move their tails, accomplish different tasks. Lions can distinguish different states than we can – they can see better at night, for example. There is a difference in the signals used and available - a lion can roar and we cannot. We can say "Hello, how are you?" in English and a lion cannot. How a lion learns to signal and how adaptive it is in its signaling behavior likely differs from us. And then, we just care about different things. Lions don't seem to care about the Yankees winning over the Mets, but they do seem to care quite a bit about what water buffalo are up to. There is so much more. There is likely *some* overlap between us and the lion of course – in our preferences, what we can do, see, signal. But although the lion lives in literally the same world, on Earth, just as we do, I can see that perhaps there is a way, given everything mentioned above, in which its "world" likely is different than ours and its language plays a significant role in that. And yet, notice that even before communicating with others, a lion would still have different actions it can

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[47] More on the idea of accuracy in Chapters 3 and 4.

perform and states it can possibly distinguish – this is true of a lion that has never communicated with *anyone.* So, it seems language (at least, of a public sort) might not be all there is to the idea.

Still, even if we seem to live, in a way, in different worlds, if a lion could speak, could we *understand* it? I think if it's fair to interpret things the way I have, then, no, unfortunately, probably we cannot say that if a lion could speak, we really could understand it, at least, not *fully.* As I said, I think there is likely some overlap but also some incommensurability. We could not fully understand the lion in the wild as another lion living the same life, playing the same game could, constrained by roughly the same dispositions, and using the same signaling system. But this is not so limiting. We can still observe from a sort of bird's-eye view the system being used by the lions - just as field biologists do - and we can understand to some extent, in a different sort of way, from the outside, what is going on. This might be similar to a knowing *how* vs. knowing *that* distinction (Stanley 2011). The lions know how to use the signaling game, how to appropriately respond, and they can physically do it. We can know (or more precisely: *believe* with a high probability) that the lions respond this way and that to such and such circumstances and that their signals carry such and such information or play such and such a communicative role in their lives, but we cannot engage in their signaling games in the wild ourselves – we just aren't the right kind of beings, the right senders and receivers for that game. We aren't lions. If we did, however, get our hands dirty and engage in some sort of signaling game with the lions – as I do with my family's cat when I open the kitchen door for him after he meows outside it; or with my horse when I tap my foot on his side to get him to go right - then we could, within this new, very limited signaling system that we've just developed, actually understand a lion in a much fuller way when it speaks. But notice this would still be a

different system from the one that lions have developed on their own *in the wild*. Lions on the

African savanna typically aren't trying to get people to open doors for them.

Chapter 2. Communication Between Groups

2.1 From Russia With Love

People often talk about groups, in particular about groups communicating with other groups or other individuals. A recent article in *Time* magazine, for example, talks about Russia "signaling" its interest in joining NATO (Roache, 2019). In a 2014 article from CNN titled "Analysis: U.S. and Russia Playing Chess or Blood Sport?" we get the following description of events:

> Frustrated with Moscow's failure to enact any compromises from the Syrian regime at U.S.-Russian sponsored peace talks in Geneva, the United States has now *signaled* [emphasis added] it is examining its policy options in Syria, where the bombing by al-Assad's forces against civilians has intensified. (Labott, 2014, para. 16)

An article in *The Guardian* reads simply: "Stock markets in Asia fell heavily after China *signalled* [emphasis added] it would retaliate against US tariffs." (Monaghan & Farrer, 2018, para. 1)

This sort of talk is also common in academic, history, and policy texts. An essay in the journal *Comparative Strategy* has the following passage:

> While the first round of the six-party talks in August 2003 allowed some
>
> breathing space in an increasingly tense situation, North Korea
>
> *signaled* [emphasis added] its determination to ratchet the pressure up further by
>
> announcing in early October that it was using plutonium… (Ayson & Taylor,
>
> 2004, p. 268)

What are we to make of this sort of talk? Should it be taken literally, even sometimes - can and do groups such as nation-states *really* issue and receive messages? Or is there perhaps some better way to describe such situations – say, as just cases of using shorthand or loose talk?

Nations, however, are arguably not the only groups out there that people talk about communicating or doing things that involve signs and meaning. What are we to make of things such as musical groups or bands? Songs are often attributed to the whole group. For a minimal case of a group, involving just two individuals, think about co-authoring a paper – is there one joint author here or are there two separate ones? And yet, humans plausibly aren't the only animals that form groups either. Might it ever make sense to say that a group of animals, say, a wolf pack, is trying to communicate something?

2.2 Three Debunking Views

As I said, one might wonder if talk about groups communicating is better understood in some way other than literally. Some might think this is likely the simplest explanation for what is

going on. I think that in many cases this will be right. But are there really *no* cases where a group might reasonably be considered a sender or receiver in its own right? To follow up on this idea, let's consider three possible "debunking" explanations for talk about group communication. These three views are adapted from a parallel argument by Irish philosopher Phillip Pettit (2014) regarding the possibility of group agents generally.

2.2.1 Metaphor

The first view I'll consider is that talk of group communication is just metaphor and not a way of talking that should be taken literally. The idea is that when I say something like "Russia sent a message to Syria", I'm really saying something as abstract and not to be taken literally as when I say something such as "Russia just delivered a slap to the face of the US". It's a way of talking that's helpful for getting an idea across. But whereas with expressions in science – for example, in biology: "Black bears hibernate in winter" or in physics: "Cesium has an atomic number of 55 and boils at 28.5 °C" – where we take the objects, properties, forces, and actions posited by our best theories to exist and *really* be out there, on this view, in the case of expressions such as "Russia sent a message to Syria" – where this would mean positing that Russia and Syria are senders and receivers and Russia can actually send messages - we do not.[48] This isn't to say that on this view Russia and Syria aren't real. Just that Russia and Syria aren't really group senders or receivers and cannot actually send and receive messages. On this view, what explains some

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[48] Of course, there are scientists and philosophers who do *not* take a realist view of scientific claims or who do take a realist sort of view but one of a very particular kind. My subtle take on this issue should become somewhat clear throughout the book. Though, I will be more explicit about my take this issue later on in the final chapter.

purported case of group communication involving something like Russia and Syria would have to be something else.

Why hold such a view? One reason might be that it's thought the material out of which group senders and receivers must be constructed - humans or other organisms standing in various relations to each other - is just not suitable for realizing something capable of functioning as a real sender or receiver. Perhaps because it's thought that signaling behavior requires being a living being, a biological entity or individual – such as a dog or a horse - not just something made up of living entities in the way that a software company or Syria is.

What is being said is basically this: (1) Only biological entities/living things can be senders or receivers, (2) group agents are not biological entities/living things. Therefore, there are no cases of group communication.

To the first premise, I say that it is not true that the sender-receiver model requires senders and receivers be living things – at least, not obviously. Nowhere have I seen it written or argued convincingly in the literature that this is required, and other options at least seem possible within the logical constraints of the framework. The thing to remember is that the sender-receiver model is simply a formal model. Anything can be a sender or receiver as long as it meets the basic requirements of the model, of being able to perform acts, observe states of the world, send or receive signals, and revise its patterns of sending or receiving by some process of feedback and selection. Senders and receivers must have interests in some sense - that's true. They must "prefer" some outcomes to others. But interest here don't have to be understood in the strong sense of biological interest. A robot, for example, that has certain interests programmed into it and that revises its signaling behavior by reinforcement learning would still

count as a sender or receiver on the basic view. Biology is just one possible realizer among many of the model's formal properties.

Could it be, however, that the constraints of the model happen to entail that the only things able to meet those constraints are things that also meet the conditions for life? I'll admit this scenario seems hazily possible. It seems, though, that we would have to have a good agreed upon definition of life to give the idea a proper looking at, and at the moment, we don't seem to have such a theory.[49] Moreover, if robot cases like the one I mentioned just a moment ago fit the model, then unless we want to start revisiting our definition of what it is to be a living thing, I think we should consider the idea that being a sender or receiver requires being a biological entity, a living thing, suspect.

Of course, others might push the other way. Some might say, well, no, it is still true that being a living being is a requirement; it is just that the analyses of the cases I provide later on in this chapter and my understanding of the robot cases are wrong. In this case, I am open to criticism and interested in hearing it. Others still might accept some of my cases yet continue to argue that being a living thing is a requirement, accepting that life extends to some of these cases too. That is an interesting option but one in need of more looking into. Another option is to take a stance to the scientific notion of life that is somewhat deflationary, perhaps similar to the view expressed in Chapter 1 regarding things like meaning. In this case, this particular debate about whether a sender or receiver must be a biological entity and whether groups or other agents are living things might become a moot point.

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[49] See Bruce Weber's article in the online *Stanford Encyclopedia of Philosophy* titled "Life" (2011), for a good introduction to the topic.

My way of handling this is to say that if it turns out that something must be a living thing to be a sender or receiver or that some group counts as a living biological entity in their own right, that's very interesting news! However, I don't think I need to answer this question about life here to make my larger point. If it turns out that the cases of group communication I'm going to look at later in this chapter fit the sender-receiver model and yet the groups involved don't seem to be living things by first glance or common use of the term, then so be it – they are still senders or receivers *according to the model*. As I said, one option might be to revise our understanding of what counts as a living thing. But there are other options.

2.2.2 Hobbes

Another possible debunking view is that talk about group communication is really just talk about group leaders.   The basis for this sort of view can be found in English philosopher Thomas Hobbes's (1588- 1679) book *Leviathan* (1651). There, Hobbes argues against the idea that group agents are as real as the individuals that comprise them. The group mind and the group voice, as he sees it, are wholly parasitic on the voice and mind of the group's leader. Going forward, I'll call this the *sovereign* view of group communication.

Hobbes's reason for preferring this view is fairly simple. He first points out that every person speaks for himself or herself in the sense of expressing his or her beliefs and intentions and in the making of promises. Indeed, for Hobbes, this is what it is to be a person – to represent or 'personate' one's self to others. He then goes on to argue that in some sense group agents do the same thing, using instead a leader to decide and speak for the group, and with the expectation that the other members will act in accordance with what the leader says.

In the case of group senders and receivers, for a sort of sovereign view to be right, it must apply to both cases of groups led by one individual or groups led by multiple individuals, a committee for example, whether that committee is composed of some members of the group or all members. In the first case, however, the case of groups led by one leader, it seems more appropriate to describe things differently than to say that what we have are true groups. Rather than group agents, we can talk of individual agents (the leaders) whose reach and power have been extended and amplified by the other members of the "group". In this case, what the leader says goes, and the people follow his or her commands. An extreme case would be zombies or enslaved people following the orders of a master. This will probably come in degrees in most cases, with some people more inclined to go along or more resistant than others. At the other end of the spectrum there might be a leader elected by a group for a time and whose behavior is still very responsive to the group's preferences.

Now let's look at the case of groups led by committees – for example, university departments, some companies, and some countries. Is the situation similar? There are a few things we need to put on the table here before we can settle this question. First, when Hobbes talked of committees, he talked of committees the voice of which was determined by majority vote. Pettit (2014) gives an argument against the view that a group led by such a committee could count as an agent. The argument applies to senders and receivers as well.

According to Pettit, to count as an agent, one must satisfy basic rational constraints such as *consistency*. To some this is a common sense requirement, to others a controversial one. I go with Pettit on agreeing that agents should satisfy a constraint of consistency *to some extent* but acknowledge that this might have to allow of degrees given that many of us do in fact seem to

sometimes hold inconsistent beliefs. In any case, a sender who doesn't keep their beliefs consistent could end up sending contradictory signals (for example, if I believe both that I see a tiger and that I don't' see a tiger, I might send signals saying "I see a tiger" and "I don't see a tiger"). A receiver who doesn't keep their beliefs consistent could be led to behavioral stalemates, to attempting to perform mutually incompatible actions at once (for example, if I believe there is a tiger and not a tiger, I might try to both run away and not run away). Do this enough, and signaling will not get off the ground or be maintained. The problem with majority voting is that even if each member of the group holds perfectly consistent beliefs, their majoritarian voice might still endorse inconsistent signaling behaviors, again the sending of contradictory signals or the performance of incompatible actions.

Take for example the discursive dilemma due to Pettit and his colleague British philosopher Christian List (List, 2006; Pettit, 2001). Suppose that three people – A, B, and C - decide to form a group, and to commit themselves to the results of majority voting. Now suppose that at some point they must vote on three logically connected issues: say, whether p, whether q, and whether $p\&q$. As List and Pettit point out, in any case like this, perfectly consistent individuals might end up voting in such a way that the group ends up committed to an inconsistent – and so, irrational – set of propositions. So, for example, take the case where A and B vote for p and C for $\sim p$; B and C vote for q and A for $\sim q$; and so, B votes for $p\&q$ and A and C for not($p\&q$). This has the result that the group endorses the inconsistent set of propositions p, q, and not($p\&q$). The group is then faced with a dilemma: go with majority opinion, and in effect break the constraint of consistency and act in a way that brings the group farther away from behaving like an ideal agent; or choose to remain closer to the ideal of an agent, and find some way to endorse a consistent set, say, p, q, and $p\&q$, rejecting decision by majority opinion.

One way to continue acting as a group agent would be to adopt the so-called "straw-vote" procedure (List and Pettit 2011), which prescribes the following steps:

- Take a majority vote on each issue as it comes up;

- Check whether there is an inconsistency with any existing view;

- If there is not, endorse the vote; and

- If there is, isolate the minimal inconsistent set and

- Decide as a group on which proposition to reject.

Must a group adopt the straw-vote procedure in order to count as acting as an agent (or a sender or receiver)? No. Plenty of other procedures work too. The requirement of a procedure is simply that it not force the group to aggregate proposition-wise on their individual judgments, which, as we've seen (thanks to the discursive dilemma), can lead them to hold and stand by inconsistent beliefs. In any case, let us suppose that a group were to adopt this new strategy for determining the voice of that group. Would this continue to support the view that talk about groups is really talk about leaders? No. This is because whereas in the case of a group represented by an individual (especially the extreme cases), an existing voice is being co-opted by members or forced upon members in order to provide them with direction as a group; in the case of a committee that operates by the straw-vote procedure, the direction is reversed: the members *construct* a voice because they satisfy the conditions of group agency. Of course, a bunch of people could co-opt or be picked up by a committee. In that case, you'd have a sort of mix of group agent and hangers on. But either way, the leader view – which might be an accurate description of things on the ground in some cases – need not be what's going on in all cases.

2.2.3 Shorthand

The final debunking explanation I'll consider is that talk about group communication is best thought of as a sort of pragmatic shorthand for the more complicated goings on at the level of individuals. Why prefer this view? One reason perhaps is the thought that the only reason we talk about group agents is that it's more convenient to do so than to get caught up in the intricate details. In other words, that our using the language of group agents is more proof of linguistic laziness or our limited ability to reason about all the fine details or talk about them efficiently than it is that group agents exist, or that groups send and receive signals.

Similar thoughts have been expressed about the goings on at the human level. Individual humans are composed of cells, in turn composed of molecules, in turn composed of atoms, and so on. Isn't talk of humans sending and receiving signals, then, really just shorthand for talk about the movement of these smaller parts going on at these more fine-grained levels? It's not. Why?

I think the simple answer is that sending and receiving behavior cannot be *reduced* in the classic philosopher's sense to things like the movement of the atoms or what is going on at one of these lower levels. In the human case, if you look lower – at neurons or others cells or atoms - then you miss why the signaling behavior came about at the higher level of the individual human. If there was an all-knowing being who could see how, say, every atom was arranged and where it would go next or every neuron fired and how it would fire next, then this being could see why a certain signaling behavior was performed, that is, they could see, given how the *atoms* of the world were arranged before or how the *neurons* fired, why at that time those atoms moved

in such and such ways or into such and such place or why such and such neurons behaved in such and such ways. But when I say they could "see why" those atoms moved in that way or those neurons fired, what I mean is that they understand it from the point of view of the level of atoms and fundamental physics or neurons and neuroscience. What they *don't* understand is why that signaling behavior came about *from the point of view of the level of the sender-receiver model,* from the level of *reinforcement learning*, *intentions, copying*, or *natural selection*. That cannot be seen at the level of things like atoms or neurons – despite what a radical reductionist or perhaps an eliminativist such as American philosophers Paul or Patricia Churchland might hope.[50] This is another argument along the lines of American philosopher and cognitive scientist Daniel Dennett's (1987) intentional stance. Sending and receiving at the individual level involves *real patterns*, patterns explained only by looking at things from the level of the intentional stance, that is, by treating senders and receivers *as* senders and receivers, as agents who represent the world and whose representational behavior is determined by things like reinforcement learning, copying, intentions, and natural selection, real patters that are missed and that cannot be adequately explained when we look at the world purely from the standpoint of what is posited by fundamental physics or neuroscience.

Now take the case of groups. Why think a similar moral applies? Consider a simple group sender or receiver from earlier, one that uses the straw-vote procedure. The straw-vote procedure is a non-mechanical process. This means that simply knowing how each individual member of the group voted, or even how the majority of members voted, will not let us pin down the resulting behavior at the level of the group. The same way individuals vote may lead at some other time to different rules being realized, and the same rule might be realized by different ways

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[50] For an introduction to eliminative materialism, see P. S. Churchland (1986) and P. M. Churchland (1988).

the individuals vote. Even the majority voting against some proposition at the individual level might result in that proposition being endorsed at the level of the group. To understand the group's behavior, then it's better to look at it *as* an agent, one that tries to maintain consistent beliefs and actions and whose signaling behavior is influenced by the consequences of the signaling behavior it's engaged in. Why does the group respond with action A when it receives signal S? Because in the past when signal S has been received and the group performed action A it had a good result for the group as a whole and that behavior was reinforced. Or if that behavior has not been reinforced or has even been negatively reinforced, it was performed because the action helps the group maintain its representational and behavioral consistency, helps it not act in a contradictory way, which is presumably a success enhancing quality – recall our discussion earlier about groups finding some way to endorse a consistent set, say, p, q, and $p\&q$ rather than the inconsistent set p, q, and not($p\&q$).[51]

One might still, however, worry about my analysis of the straw-vote group agent case for another reason. Suppose that we could see how every member voted *and* we knew that they used the straw-vote procedure to settle inconsistencies. Now it would seem that maybe we could understand why the group sender behaved the way it did simply by looking at the lower level *plus* the straw-vote decision procedure – that is, by looking at things from a sort of middle or

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[51] Suppose we have a case of majority rule. Won't the signal just be determined by what the majority votes for? Won't sending and receiving behavior of the "group" really just be reducible to the sending and receiving behavior of the individual members? I think it will, because all one needs to do in that case is look at the behavior of the individual members to predict what will happen – there's no need to understand how things work at the higher level, how things like reinforcement learning or natural selection influence that behavior at the *group* level, only at the individual level. I think this gives even more reason to think that the simple majority rule case is not a good example of a group sender or receiver. As I'll explain in more detail in the next section, however, I also see this status – group agent status - as coming in *degrees*. So, I wouldn't want to say it's a *completely* non-group case - just one somewhere to the left of a paradigm group agent if we were to put it on a sliding scale ranging from non-group agents to paradigm group agents.

intermediary level.[52] Should this worry us when it comes to considering certain groups agents in

their own right? I think not. Consider that each of us as individuals follows some sort of

decision procedure in our own lives - sometimes more consciously or reflectively, sometimes

not. Perhaps in some cases, that decision procedure has been selected for by some sort of

reinforcement learning or by natural selection and we aren't very aware of it; perhaps sometimes

we consciously decide to follow one. Does this make *us* something other than actual agents? As

something other than worthy of the intentional stance? It does not. We don't say, "Daniel isn't

an agent because from a step back we can see that he implements decision procedure X and his

implementing that is a result of his parts in some way bringing that about, "agreeing" to it, or

settling on it, consciously or not". We don't. And the same moral, I think, applies to groups. In

fact, I think that in some groups - say, very early human groups, one-off groups, or groups where

there is some impediment to straight forward communication through language – the decision

procedure *will* have been adopted in a less explicit way, through some sort of back and forth,

whether that be some form of reinforcement learning, copying, or natural selection. If there isn't

a problem with this in the human case, it's hard to see why there should be one at the group

level.[53]

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[52] A worry along these lines is also brought up by Roth (2017)

[53] I think another reason to reject this way of looking at things, of looking at the votes plus the decision procedure, is that we can keep pushing and end up in a regress. For example, one might worry, "How did the group come to settle on the straw-vote? Did they use a straw-vote procedure to take a vote on using the straw-vote procedure? And then what of *that* procedure?" But then notice that the same sort of question can be asked of Daniel: "Well, Daniel uses decision procedure X, how did he get to settling on that? Did he use decision procedure Y? And then how did he settle on Y? Did he use Z?" And so on. A worry somewhat like this is pointed out by Resnik (1987).

2.3 Real-world Cases

As we saw at the beginning of this chapter, the state – as in a nation-state - is often thought of or talked about as a group engaging in communicative behavior. This isn't an uncommon view, nor is it unmotivated. The state is an entity that deals across changes of government with its own members and other states. In international politics, states are routinely held to expectations of consistency in legal and other forums (McLean, 2003). And, as a matter of fact, in international relations theory there is a whole research tradition – the "realist" tradition – based on modeling states as agents (Waltz, 1979), which was instrumental in devising political and military strategies during the Cold War.

So, is there a good example of signaling in the case of states? Are there in fact real-world examples of group communication in this area? I think there are some cases worth looking at. Some will turn out to count as instances of group communication, some not. Due to their complexity and the amount of space it takes to properly examine them, I'll only discuss a few here. Why look at cases that end up not counting as group communication? I look at a couple of these simply because they are cases that are often talked about as instances of group communication in everyday talk and more conversation and because they are such interesting and seemingly conspicuous examples.

The first case I'll look at is that of *declaring war*. In the United States, officially, it is the Congress, acting as a committee similar to the sort discussed earlier, that makes the decision to go to war – the responsibility has been offloaded onto them. Here, interests are "tied together". What is decided by the state is decided by the representatives, who are in turn chosen by and sensitive to the preferences of voters. One might worry that the procedure is fairly mechanical.

But again, as with the straw vote case, the same way individuals vote may lead at some other time to a declaration being made or not, and a declaration being made or not might be realized by different ways the individuals vote. In the case of ties, the Vice-president even has the power to break the stalemate. Feedback occurs in a sort of trickle up way. Leaders (the president and Congress) are sensitive to voters. At the most basic level, if the consequence of sending the signal is bad, voters might not re-elect the leaders. If the consequence is good, they might re-elect them and so reinforce that way of communicating.

Perhaps a distinction should be made here. There's a difference between the formal process involved in deciding to go to war and the way that decision is conveyed to receivers. Which of these is the signal? I don't want to say that the performance of the formal decision-making process (the act of voting in Congress) is the signal in the case of states for the same reasons I don't want to say that the performance of the internal decision-making process resulting in my deciding to fight or not fight someone (the goings on in my brain) is a signal – these might offer us some natural sign like information, but there is no conventionality here, no back and forth. This is just a case of looking at the inner workings of the machine and using the information gathered from that to then perform some action. Looking at the process that produces the signal rather than the signal produced.

But let's go back to the traditional sense of a declaration of war, how receiver-states learn that a sender-state is going to engage in violent action. This I take to be an obvious candidate for a potential signal, though apparently one where the purpose is to coordinate acts-with-acts. The sender-state is telling the aggressor-state that it is preparing for and going to war, and eventually going to attack or defend using violence – it is not just telling them how some external state of

the world is. Of course, not all wars come with declarations, but many do. And in the past, declarations of war came in many forms - the form of formal documents or letters, sometimes telegraphs, and even public speeches. That there is a variety of ways declarations have been made in the past, tells us already that there is a degree of conventionality here. If states really wanted to, they could even declare war simply by sending a certain playing card, say, the ace of spades, in the mail to the head of state of a receiver-state.

At this point, one might reasonably ask "But why make declarations of war?" This needs to be answered – there needs to be a reason for sending a signal and maintaining a convention. One suggestion is that abiding by this convention brings about a sort of mutually beneficial stability. Without it, it's extremely difficult to tell when another group is going to attack. This would mean that states would need to be on high alert at all times, arguably expending more resources on defense that instead could be saved or directed to other issues or programs in need of attention.[54] With the declaration convention in place, however, resources can be dedicated elsewhere – to the construction of roads and schools – and troops can be put on reserve. Of course, this does not mean that it won't sometimes be beneficial for a state to break the convention in the form of a sneak attack. But if sneak attacks become too common, the

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[54] Someone might say, "Well, the US does this already even though no one has declared war on them since 1941" – that is, dedicate a significant amount of resources to the military that might be saved or directed elsewhere. My response is that this is true but my point is that if the convention weren't in place, then the US would be, and would have been, dedicating even *more* resources to defense.

convention will break down, eventually making even the benefits from occasional sneak attacks unavailable.[55] [56]

Another suggestion some have made for the purpose of declaring war is that doing so was in line with principles of chivalry. 18th century Dutch jurist Cornelius van Bynkershoek (1673-1743) writes "nations and princes endowed with some pride are not generally willing to wage war without a previous declaration, for they wish by an open attack to render victory more honourable and glorious." (Bynkershoek, 1737/1930, Bk. 1, Ch. 2, p. 8). This sort of thing was written about even in ancient Greece and Rome. Ancient Greek historian and general Thucydides writes in his *History of the Peloponnesian War* (431 BCE) that when Plataea was attacked by Thebes by surprise that the Plataeans considered it "impious" (Bk. 2, v). Roman statesman Cicero writes in his *De Officiis,* "No war is just unless… it has been formally announced and declared beforehand." (44 BCE/1887, Book 1, para. 11). This seems somewhat plausible as at least maybe a partial explanation for *some* cases, and it seems it would fit the sender-receiver model too. If those who send a warning before an attack are subsequently more, say, highly esteemed by other nations, and so, treated better by other nations or more likely to be helped by them, then there is an incentive for that kind of sending behavior to get off the ground (never mind why that sort of behavior is esteemed in the first place – perhaps it's more

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[55] This at least appeared to be the convention for a while (especially around the WWI-WWII timeframe). Evidence for this would be the historical regular use of declarations around this time. Other evidence includes the agreements at the Second Hague Convention (III) of 1907. Of course, since the Korean War, how "wars" (if we can call them those rather than "policing actions" or "military operations") have been conducted has radically changed.

[56] Someone might reply: but there are also ways of detecting threat in the absence of a declaration of war – e.g. when troops are being amassed on your border. To this, I say this is also true. However, I think it is plausible there are cases where the benefit of having a declaration convention might outweigh the strategy of simply relying on detection. For example, in some cases, detection might not be possible until now what you are dealing with is basically just a sneak attack, or detection might be unreliable, or unavailable. In other cases, it might be that detection can't rule out well enough whether another country is actually intending to attack – in which case, acting without having received a declaration of war, might result in attacking a country that actually had no intention of violent action.

impressive to win with warning than with a sneak attack, or perhaps doing so is more in line with one's values. Other options are possible.) But then if this account is right, this warning signal has a sort of dual purpose, to warn opponents and to signal something like chivalry (or what it entails) to others.

That's enough of the possible functions of declarations of war. Are there any cases of actual declarations of war that fit the model? In the case of the United States, the US has only *formally* declared war eleven times – although, it has obviously engaged in many more major armed conflicts than that. Perhaps the most famous declaration of war is the declaration of war on Japan (and other Axis nations) during the Second World War. Although President Roosevelt asked Congress to declare war on Japan in his famous Infamy Speech, the actual call for war was only formalized after Congress voted to declare it, and there was in fact one dissenting vote.[57] But the case is not perfect. We all know too well that the American political process then, as it is now, was influenced by outside forces it wasn't supposed to be influenced by - by corporate and foreign interests, for example - not just by the people. The voting system in America then was also far from equal and accessible to all - whereas today it is arguably better, although still not ideal. In any case, back then there was, like today, gerrymandering and pay-for-play politics; they also had Jim Crow laws in effect, disenfranchising people of color from the political process; most Native Americans could still not vote; citizens in territories didn't have the right to vote or to representation; and the voting age then hadn't yet been lowered to 18.[58] On this kind

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[57] The sole dissenting vote was cast by Montana Representative Jeannette Pickering Rankin, the first woman elected to the U.S. House of Representatives and an ardent pacifist.

[58] Racial disenfranchisement in the political process still exists today in various forms but an explicit prohibition on racial discrimination in voting was put on place by Congress with the Voting Rights Act of 1965 – (though, see discussions of Section 5 and the Supreme Court's decision in *Shelby County v. Holder*. The VRA also ensured the right to vote to Native Americans. The age limit on voting wouldn't be lowered until the passage of the Twenty-sixth Amendment to the United States Constitution in 1971.

of set-up, the shape America takes as a group is more like that of a not quite democratically elected committee of some members of the group leading or dragging along the other members, and one where the democratic nature of that committee is itself to some extent compromised by how it was formed and by how the decisions of members are improperly influenced. On the receiver side of the WWII case, Japan doesn't fare much better as a group. Given the way the Japanese government was set up at the time – as a one-party totalitarian military dictatorship under Emperor Hirohito – the case seems much closer to the sovereign version of a group setup. A similar story, it seems, would apply to another party the US declared war on in 1941: Germany under the rule of Adolf Hitler. Hitler's word, then was the final world. But in addition to all this, the US's declarations on Japan and Germany were in response to those two countries having declared war on (and in the former's case, attacked) the US already. So, the US's declaration in that case was really more of a response, a sort of acknowledgement that they would act in kind rather than surrender or try to negotiate some other solution. Either way, what we have here – in the case of the US - does seem to be to some extent an example of a group signal, from a group sender, albeit definitely not a clean and perfect paradigm example. It also seems to be a signal sent to collective entities – Nazi Germany and Imperial Japan – who, however, do not appear to meet the requirements of being group communicators.

Is there a case involving the US where the receiver side is closer to our notion of a group than to the sovereign version? It's hard to tell. In the war of 1812, for example, the US fought not only Britain but also the Native American tribes with whom Britain was allied. Some of these tribes were organized into a confederacy under the Shawnee warrior chief Tecumseh (1768-1813). The confederacy worked through a system of representatives from the various tribal villages. This system seems closer to our version of a group than the Imperial Japanese or

Nazi Germany cases do, but it's still not perfect. It's not clear in every instance how the various representatives were chosen by the disparate tribes and subgroups, how they settled their votes, what influences there might have been. Tecumseh seems to have had a lot of latitude and sway in the confederacy and been the leader, so how democratic the confederacy was at that level is questionable too. Tecumseh even appears to have gotten some of the tribes in his confederacy to back him at least partly through threats of violence.[59]

Other tribes allied with Britain and not a part of Tecumseh's Confederacy had their own unique political structures, some closer to the sovereign version of a group, some not. A council of chiefs, for example, led the Sauk people. In that council, a number of members were chosen based on their skills or talents, but the civil chiefs – those who were looked to for guidance on political concerns - were chosen through heredity. This seems to be an example of a sort of mix, an in between group case.

The 1812 case is further muddied by the formal text of the US's declaration of war for the War of 1812, which doesn't explicitly mention the Native American tribes:

> Be it enacted by the Senate and House of Representatives of the United States of
> America in Congress assembled, That war be and is hereby declared to exist
> between the United Kingdom of Great Britain and Ireland and the dependencies
> thereof... (Act of June 18, 1812, Ch. 102, 2 Stat. 755)

This makes it unclear whether the tribes count as one of the parties the US declared war against with that particular signal, especially since the US had already been fighting with Tecumseh and

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[59] See, for example, Tecumseh's "Speech to Governor Harrison, 20 August 1810" [Manuscript]. Indiana Historical Society. https://images.indianahistory.org/digital/collection/dc007/id/19/

his warriors for some time. Another plausible explanation for the wording of the declaration is that the United States government at the time simply regarded the tribes involved as subordinate to the British in some way and not really the primary party they were dealing with in this conflict.[60]

Let's take a look at Britain then. Here the candidate is not perfect either. During this time, the United Kingdom was a peculiar political entity with partly constitutional rule and partly Royal direction. Parliament's composition was partly determined by hereditary right. Universal suffrage was still decades away, and in act only a small percentage of land-owning men could vote in any manner. Declarations of war, under this system, were formally the right of the monarch, not the people or Parliament. The case seems, although perhaps not as far toward a sovereign group as Imperial Japan or Nazi Germany, closer to a sovereign one than a paradigm group example.

Other cases are similar. Consider the declaration of war by the US against the United States of Mexico, igniting the Mexican-American War (1846-48). Mexico was, according to the Constitution of 1824, a federal republic. And yet, the political situation in Mexico at the time of the war was extremely unstable – there were four presidents in 1846 alone. So, whether it's safe to say that there was really a unified and consistent receiver is difficult. In both these cases, too the United States' status as a paradigm democracy was worse off than in the WWII example. Consider that both the War of 1812 case and the Mexican-American War case take place before

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[60] How the Americans and British regarded the various Native American tribes involved in the conflict is a rather interesting and complicated issue. For example, John Quincy Adams argued against including the various tribes in the peace treaty process and even seems to have argued for US sovereignty over them. See Hatter (2017), for a good overview.

women had the right to vote in the US, before white men without land or people of color (including Native Americans) could vote, and that during this time slavery was still legal.

As I said, the US has engaged in armed conflict with other political entities, but these other cases have not involved *official* declarations of war. The American Civil War is an example, where the Confederacy was instead considered a "belligerent power". This denied the Confederacy recognition as a sovereign state but allowed the US to consider the Confederates insurrectionists against the US government and to engage the Confederates within the rules of war at the time anyway (Finkelman, 1992).

The American Indian Wars - the conflicts with the Apache, Iroquois, and other indigenous tribes – aren't considered official wars by the United States government either.

So, *is* there an example of a declaration of war by one group against another in the sense that we're interested in here? In the case of the US, as we have seen, there does not seem to be an excellent, paradigm example of a formal or official declaration. Some cases are somewhat closer than others, but nothing is perfect. Unfortunately, I am unable to find any good historical accounts outside the American context that get close to fitting the model either.

I take another conspicuous possible example of signaling between states to be the public condemnation by one state of another state's actions, for example, the US publicly condemning Russia over Russia's actions in Crimea and Ukraine. First, again, what plays the role here of the signal is conventional. It could be done by open letter, by public speech, etc. What does the signal stand for or what is its purpose? Why condemn the actions of another country? One possibility seems to be that it allows the sender-country to express its preferences, to say that it

would prefer the aggressor state discontinued or not repeat whatever it's doing or has done. However, it might also serve to express a warning. It might say in effect, "If you don't shape up, we might do something about it", at the same time leaving room for the sender to avoid direct conflict. The signal is in a sense cooperative, just as it appears the rattle of the rattlesnake might be cooperative.[61] The rattlesnake wants to warn the predator and avoid taking direct action – biting and envenoming – if it doesn't have to. The rattlesnake would prefer the predator leave than the rattlesnake having to waste its energy and venom. The predator, on the other hand, would rather be warned and avoid the wrath of the rattlesnake than have the rattlesnake skip the warning and attack right away. Just as a coyote might notice that a rattlesnake always attacks after it has rattled and the coyote continued to bug it, a receiver-state might notice that a sender-state always or usually acts a certain way after sending one of these public condemnations, and so then use that information to guide its actions. Likewise, a sender-state might notice this pattern, and so send that signal each time it wants that sort of reaction.

In many cases like these, I think what we have won't simply be reducible to the group leader model, the sovereign model. Suppose it's 2010 and Obama is the one talking on the phone to Putin and making the final decisions. It's not like what we have is a paradigm sovereign zombies or enslaved persons case. Obama was elected by the people to serve as their representative, their decision-maker and voice, in such situations. Although, having Congress make the decisions and send the message instead of Obama in this scenario would bring us closer to a paradigm case of a group sender, this case is still at least somewhere between a group sender case and a paradigm sovereign case. It gets a little farther away from the group case (and a little bit closer to the sovereign case), of course, however, when we think about how imperfect

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[61] See Hay (1887), Barbour (1922), Klauber (1972), and Reiserer & Schuett (2016).

political representation currently is in the United States.[62] On the Russian side, Putin was even

less democratically appointed than Obama. To say that the Russian case provides a good

example of a group receiver seems less fair. Perhaps one could make a case that the Russian

people not rising up against Putin counts as some form of consent to his serving as their

representative and voice, but if this is true, it is surely one of the lowest levels of consent, putting

the case very close to that of a sovereign situation. Suffice to say, neither group – the US nor

Russia – is a *paradigm* group agent. Both groups are to the right of the ideal group case and to

the left of the paradigm sovereign case, the US arguably being a bit farther left on the spectrum

than Russia.[63]

Group Agent   Hobbes

⟵———————————————————————⟶

Total democracy   US   Russia   Nazi Germany
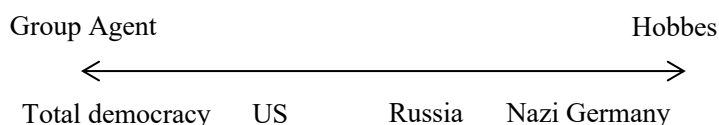
Figure 2.1. The group agent-Hobbesian agent spectrum of group signaling.[64]

I'd like to take a second here now to address a finer detail. Someone might ask: why fix on

democracy as the mark of group agency? For example, why not focus on shared beliefs and

values? Why can't Democrats and Catholics count as groups in my more technical sense of the

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[62] Again, just consider how wide-spread pay-to-play politics, gerrymandering, and voter suppression are; the Section 5 issue of the Voting Rights Act; representation in territories; and so on.

[63] In the US case, it might be more accurate to think of the voice of the US as coming from different mouths of one multi-mouthed creature at different times. Not only is the Congress empowered in certain situations to act as the voice of the US, but in other situations so is the President, and maybe in further situations others still. For example, the Congress might function as the appropriate elected decision-maker and mouth for the US when it comes to declaring war, but it was FDR who made the decisions and acted as the mouth of the US when meeting with Churchill or other leaders to discuss certain war plans. This would put the US on a different place on the spectrum than if it were a group using just one of these strategies for making decisions and communicating – for example, if the US had only an elected president and no elected Congress to make official decisions and communications.

[64] Here, I'm taking a group that functions by total democracy – that is, a group where every member is engaged and votes rather than just a committee made up of some members – and that decides inconsistencies in a non-mechanical way, as a paradigm group.

term? Why doesn't something like Catholics signaling disapproval of the Vatican council by declining church attendance or donations count? I'll make two remarks here. The first is that I think cases like these – the Catholic case – don't count because what is really happening is that although the members share beliefs and values, they are not *acting* as a group. What is really going on is that individuals with similar beliefs and values are acting on their own, making the decision to attend or not on their own and all of them happening to make the individual choice at roughly the same time results in something that, at a step back, looks like a coordinated group behavior – that is, a large portion of them not attending or donating all at roughly the same time. This could have been a group behavior, however, if instead of each Catholic making this choice on their own in the privacy of their own homes, so to speak, without consultation of others, they all got together and discussed this and voted on it before hand and that *that* – the group vote – is why each of them ended up not attending or donating at roughly the same time. Then we do have a group action in the sense I'm concerned with here. So, it's not impossible for these cases to be group actions, but I think many cases that appear to be group actions will, for the reasons I just mentioned, end up not being so.

The second point I want to make is a more general one that I hinted at in a footnote earlier. People who work on the topic of group agency often talk about "joint actions".[65] For example, it's thought that two people can work together to rescue someone, say, a drowning child in an overturned raft, without having talked about it before hand and without any explicit verbal agreement to do so and how to do so. They both just see the child drowning, rush out there to help the child, and then during the process end up coordinating their behavior to do

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[65] See, for example, Gilbert (1990), (2008); Searle (1990); Bratman (1987), (1992), (1993), (1997), (1997); Pettit (2001), (2003), (2009), (2014); Pettit & Schweikard (2006); and Rachar (2018).

things like get the child out from under the raft, drag the child out of the water together, and do

chest compressions while one does rescue breathing or goes for help. How does my analysis

handle cases such as these? My answer is this. As I've already suggested, I think group

behavior comes in *degree*s or on a sort of *spectrum*.[66] I'm inclined to think that the straw-vote

style group is a *paradigm* case of a group agent. But notice that this paradigm can be altered in

many ways. Maybe some members vote for representatives who then vote in the straw-vote

session. Maybe some members choose not to vote in the straw-vote (or not vote for

representatives who do) but still go along with the outcomes. Maybe sometimes the group is led

by the straw-vote committee and sometimes in certain situations by a leader who was voted in.

Maybe the votes are influenced sometimes by outside sources (money, special interests). And

then consider, for lack of better words, less "explicit" or less "intentional" cases. For example,

consider the famous rowboat case written about by Scottish philosopher David Hume (1711-

1776) in his *A Treatise of Human Nature* (1739–1740). There two rowers with the same

preferences and same goal of rowing forward eventually synchronize through reinforcement

learning of a sort to row together in a certain direction despite neither of them talking to each

other or explicitly agreeing on how and when to row before hand.[67] There's no voting or talking

in this sort of case and yet a group or joint action is being performed. It seems to me a *lot* of

group cases involve something like this, some sort of "implicit" agreement that comes about

through shared values and beliefs and some sort of back and forth (working as a replacement for

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[66] This seems contrary to many accounts of joint action and group agency. Gilbert (1993, 1999), for example, argues that agents engage in a sort of commitment, promise, or obligation that cannot be unilaterally abandoned. My view would leave wiggle room here.

[67] Christopher Kutz (2000) worries about what he calls "on the fly" cases of joint action, cases where there is no prior planning; Gilbert's account doesn't seem to allow for these. I'm talking about roughly the same thing Kutz is here, but my worry seems to be broader in scope, taking his "on the fly" cases as a subset of a broader category of non-explicit or implicit joint actions. Kutz also appears to be wedded to the idea that intentions of a human sort must be involved, whereas I am not.

explicit voting).[68] As suggested earlier, this, I think, can apply to the choice of decision

procedure being used too. And it seems like such an analysis might even be extended to animal

cases – which I'll discuss later in this chapter. Even evolution through natural selection on a

larger time scale might provide the necessary implicit mechanism for joint behavior. On this

take, "groupness" and "joint action" come on at least two sorts of scales or spectrums, with some

case being more paradigm and some less, and some cases being brought about by more "explicit"

mechanisms and some by less explicit ones.

Most philosophers of action will probably disagree with this sort of analysis. Canadian

philosopher Matthew Rachar (personal communication, February 26, 2020), for example, takes

intentions to be key to the possibility of group behavior. This requirement – that intentions be

involved - is extremely common in the group agency and joint action literature, and the idea has

been defended in many different forms.[69] Rachar in particular thinks that probably most animals

do not have the requisite intentions, and so he thinks that most apparent cases of animal groups

and joint action in animals will not really count in the sense being discussed in this chapter.

However, as Tollefsen (2014) points out, there are many cases of what prima facia appear to be

joint action in animals – consider the complex cooperative hunting techniques of Orcas,

cooperative hunting in lions and wolves, and the complex cooperative work of ants. There

seems to be no reason to rule these cases out as joint action aside from the apparent lack of

complex intentions in their subjects, and yet, to rule them out based on this seems to beg the

question about what's important for joint action. In Chapter 1, on the other hand, I took a

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[68] Bratman (2004, 2006) introduces a similar idea regarding the role of shared values in joint action. It's also worth
noting that most accounts of joint action do not provide an explanation of how joint actions come about over time
and how agents keep track of their own actions and the joint action in order to follow through with the joint goal.
My account does this to some extent, suggesting that this occurs through a continuous back and forth.
[69] See, for example, Gilbert 1989, 1996, 2003; Bratman 1993, 2004, 2006; Velleman 1997; Searle 1990, 1995.

deflationary stance toward intentions, hence my position here. The result seems to be that my

disagreement with philosophers like Rachar is due to a difference in certain background

assumptions about intentions. Perhaps it's worth noting that my view seems to allow for the

prima facia animal cases to fit in whereas Rachar's and the views of other authors do not.

That's it for the finer details. The cases of communication I've discussed so far involve

somewhat settled international conventions.[70] How about more creative one-off incidents? A

case here might be found in the Cuban Missile Crisis of 1962. We see this idea expressed in the

2000 film *Thirteen Days* by Robert McNamara's character, who in response to a stubborn

general's complaint about the American blockade of Cuba retorts, "This is not a blockade. This

is language. A new vocabulary, the likes of which the world has never seen!" What

McNamara's character meant was that each move the parties made during the Crisis was taken to

mean something more than the action itself, to be sending a message to the other side. This was

because each party knew what possible moves were available to them and how they'd have to act

given certain ways the other player played. Kennedy's team knew this and Khrushchev's team

knew this and they both knew that they both knew this and so on. And so, Kennedy's team

chose to set up the blockade not just for physical purposes but because it was one out of a set of

available moves, and they knew that choosing that move communicated to the Russians that the

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[70] One might ask: are these really international conventions here or are these pronouncements just derivative of
ordinary expressions of disapproval or something similar? My response is that they might be derivative to some
extent, but I think that's okay. It could be that a duly elected leader or a committee decides that sending particular
kind of a warning – what they will call a "sanction" – is a good idea in some case. That can be derivative if this idea
came from the idea of enacting a somewhat similar warning to another *person* (rather than a group). But once the
idea is transformed into one that can be applied to a group (say, a country), that has consequences at the group level,
and whose appropriate responses are at the group level, it becomes a signaling behavior that is either repeated and
stabilized or not at the group level, not at the level of just two people warning each other (unless you have two
sovereign or very near sovereign cases).

US was trying to diffuse the situation rather than escalate – that from the point of view of the Russians that would be the best explanation for the US acting that way.

Again, despite Kennedy and Khrushchev being center stage in this story, I don't think the case is reducible to just the group leader model, the sovereign model. Kennedy was the one talking on the phone to Khrushchev and making the final decisions, but he was elected by the people to serve as their representative and voice and he was sensitive to their preferences to some extent. Again, as earlier, having the Congress serve as the voice in this situation would have brought us closer to a paradigm case of a group sender, but the case is still somewhere between a group sender case and a paradigm sovereign case as in the case with the sanctions. And, again, it gets a little farther away from the ideal group case (and closer to the sovereign case), when we take into account how problematic political representation was back then – President Kennedy and the Congress of that time were elected before the passage of the Voting Rights Act and the Twenty-sixth Amendment for example, among other issues. On the Russian side, things were, once again, not ideal. Like Putin, Khrushchev was also less democratically appointed than his American counterpart was. Perhaps one could, again, make a case that the Soviet people not rising up against him and the Soviet government counts as some form of consent to his serving as their representative and voice, but, again, it would be one of the lowest levels of consent and put the case very close to that of a sovereign situation.[71]

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[71] One might wonder: why fix on democracy as the mark of "groupness"/group agency? Why not shared beliefs and values? For example, why not count Catholics signaling disapproval of the Vatican council by declining church attendance or donations as a case of group signaling? I don't count "group" cases such as these since these are really just cases of individuals making independent choices which just happen to be similar due to their having similar beliefs. Presumably there was no attempt to come to a decision to make this move *as a group*. There was no voting in some sense, and the decision is not binding to the rest of the members – plenty of Catholics still attend. If, however, all Catholics or a large group of Catholics came together and voted on this move and agreed to be bound by the result of that decision process, that would be a different story, then we might actually get something like a group signal.

So far, we've looked at cases of signaling between two groups. Might there also be cases of signaling between groups and individuals? This also seems possible. For a simple example of the first case, consider a lone terrorist sending a video message to the United States, warning of a terrorist attack unless the US changes certain policies. How the state acts will depend on, other things aside, how elected officials act and how these officials act is going to depend (ideally) on how their constituents would prefer they react to the message. They'll also have to judge whether the threat is credible, whether there is perhaps a history of it being used this way. On the other side, what message the US sends to the terrorist is going to depend on how the US thinks the terrorist will interpret it, and how the terrorist interprets it will depend in part on how they think the US wants them to interpret it, perhaps basing this judgment off of the consequences of past similar interactions they've had or observed involving the US. This could even be done obliquely too. The terrorist side could broadcast a call to jihad against the US that is meant to be seen on TV by potential recruits as well as the US administration. Similarly, the US could announce a war on terror in region X meant for everyone, including the terrorists, to see.

These are examples of an individual who is not a member of the group communicating with the group and vice versa. We might distinguish a third category of group to individual signaling: signaling from a group to one of its members or from a member of the group to the group. A simple example here, where the same basic idea applies, might be when Congress sends a letter to an American citizen. A case in the reverse would be a US citizen writing to Congress.

What about seemingly more complicated cases of group signaling such as singing in a choir or co-authoring a speech? Do these count as instances of group communication? I think these can. The relevant signals here are not as one might expect, namely the individual parts of the song (Paul's singing or John's guitar playing) or the individually written parts of the speech, but rather the *entire* song and the *entire* speech. In a genuine paradigm case of group signaling, how the entire song or speech ends up depends on more than just what one member of the group thinks – there will be voting in some sense and settling of inconsistencies - otherwise we just get the sovereign case. Indeed, some cases in this area may fit the sovereign scenario better – if, for example, one member of the band calls all the shots and just tells the other members what to play - but let's set those cases aside for the moment. How do the preferences work here? The speechwriters (or singers) might be members of a political party (or band) and have the party (or band) as their main source of income. Then the success of the party (or band) is important to each of the members and they have an incentive to come up with a speech (or song) that will help ensure the party's (or band's) success. Or maybe there is a cause they want their work to further, and preferences are attached to the successful furthering of that cause. Of course, this means they will have to be sensitive to feedback from the receiver side. But why should the receiver care? Perhaps a good speech (or good music) makes them feel good or helps change their behavior in some beneficial way. It could be that they learn something from the message that helps them better navigate their lives or cooperate with others for some collective goal. The possibilities seem endless. I'll discuss cases of group communication like these, cases in the artistic realm, in more detail in the next chapter.

2.4 Non-Human Groups

Humans aren't the only creatures that form groups. Could it be that there are non-human cases of group communication? It seems at least possible. Everything that's been said about the possibility of human groups in Section 2.2 applies to animal groups in theory. But are there any real-world cases of non-human group communication?

One seemingly conspicuous case is the chorus howling of wolves. The wolves will howl together but at different pitches, often starting with a high-ranking member whose howl is lower and shorter. One purpose of these choral howls seems to be marking territory or maintaining spacing from other wolf packs (Harrington, 1987; Joslin, 1967; Mech, 1974, Harrington & Mech, 1979, 1983). Could these be group signals rather than just a bunch of individuals joining in on a leader doing something or being forced by a leader to do something? It seems plausible to me that this is a case somewhere more toward the group end of the spectrum of individual and group signaling.

There is a lot going for the thesis. Wolf packs tend to be composed mostly of family members (Mech, 1999).[72] They engage in other cooperative behaviors such as hunting. And there's even some evidence they pass down certain knowledge in some way to their offspring (Haber & Holleman, 2013). During a chorus the wolves will howl at different pitches with different tone modulations. It's been shown that this gives the chorus the so-called *Beau Geste*

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[72] Wolf packs will sometimes, of course, integrate outsiders, and the two main parents of the pack - sometimes more than two - will not be siblings.

Effect, making it seem like it was created by a group much larger (Harrington 1989).[73][74] On the *territory marking* interpretation of the signal, this effect of the chorus is good for *all* the wolves in the group – it dissuades invaders and prevents inter-pack conflict – and the effect couldn't be accomplished by just one wolf alone.[75]

It's not hard to imagine that a wolf pack that learns this behavior might have an advantage over packs that don't. And this sort of thing could get off the ground pretty easily. A pack happens to do this for one reason or another – maybe the pups in that pack are more prone to copying elders, or the members of the pack do this for bonding purposes. Then because the pack does this and does it in a way that creates a Beau Geste effect, the pack happens to be more successful at preventing others from encroaching on their territory, and so, better at avoiding violence and loss of resources. A pack could then, in a similar way to how they teach hunting techniques, teach this howling technique to their offspring in order to maintain the signaling system – probably through a combination of copying by the young and reinforcement or correction by the elders. Pups, though they make many other vocalizations right from birth, only howl sporadically (Coscia, 1995). But they begin to join the pack in howling around three weeks old (Mech & Boitani, 2010; Mech, 1988). It's also been observed that the pitch of a member's individual howl in the chorus will increase as the individual's rank among the pack decreases (and the visa versa), and there is even evidence of wolves correcting others or at least preventing others from howling in a chorus, though not great evidence yet of correction in a more subtle

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[73] The effect is named after the English novel of the same name by P.C. Wren in which French Foreign Legion troops in North Africa are forced to prop up the dead bodies of their comrades to fool their enemies into thinking the they have more men. It's also the name of a 1939 film starring Gary Cooper.
[74] The Beau Geste hypothesis was introduced by English zoologist John Krebs (1977) to explain why some bird species have such impressive song repertoires.
[75] Another use for the howl might be the reassembling of separated members. See Mech (1966) and Theberge & Falls (1967).

"howl this way, rather than this way" sense, a more subtle *teaching of technique* sense (F.

Harrington, personal communication, February 1, 2020). This would be even stronger evidence.

Is there any sort of voting in the wolf case? A committee like structure or leader as in the

organization of human groups? How do the wolves actually make these decisions about

howling? That part of the story at present is still to be fully worked out. For a time, many

people believed there was a sort of alpha wolf structure to packs. In some cases, this seems to be

true and the parents play the primary deciding role, communicating their desires through eye

contact, body language, and physical intervention. In extreme cases of this, we might move

closer to a sovereign case with one parent wolf calling the shots. When two parents have to

work together to decide, we get closer to a case of a group led by a committee. Other studies

have shown that some packs are even more egalitarian (Mech, 1999; Dutcher et al., 2003).

A phenomenon that seems somewhat similar to choral howling is what biologists call

mobbing. This is where a group of animals, say, a heard of bison, gathers around a predator in a

group once another member spots it, and if the predator doesn't back down, attacks. The animals

do this, of course, despite the same behavior being dangerous when done alone (and so, seldom

done alone) – imagine just one water buffalo standing up to a lion rather than the whole group of

them. In these group mobbing cases, the warning before the attack seems to be something like

"Back off or our gang will get you". Is it a case of group signaling? It seems to be close. The

signal benefits *all* members, and is not just sent by one member or by each member on their own.

And it's plausible for a behavior like this to be something that is reinforced or selected for at the

group level – the groups that do it survive and those that don't do not. As with the wolves, what

is the organization like? How are decisions like this made by the group? How is this behavior passed on – copying by the younger generations and reinforcement by the old? It's hard to tell.

I'll end by considering one more example. Himalayan honey bees are known for engaging in a behavior that from a distance makes it look like they are doing the wave – the wave you see everybody stand up and do at baseball games. The bees simply raise their rears in the air instead of their hands (which they don't have). The behavior is known as "shimmering," and it's thought to be defensive, to send a message to or to startle predators such as wasps (Kastberger et al., 2008). Is this a signal? Is it a group signal? It seems plausible. Chinese researcher Ken Tan and colleagues (2008) argue that the signal says roughly, "I see you", though I think "We see you and we'll get you if you get too close" is probably a better rendering if it is indeed a *group* signal. Either way on this rendering the signal is a sort of warning to the wasp since the bees can in fact mob it and kill it if need be. Here there could have been an evolutionary back and forth. Hives with bees that performed the coordinated behavior might have fared better than those that did not. Wasps that learned the message and responded appropriately survived. What does the work is the information carried by the signal, that the bees see the wasp and are ready to go after it. That's one story for what's going on here. But it could be instead that what is primarily doing the work is not information carried by the shimmering but a propensity in the wasp to be frightened by that sort of stimuli. Here again there could be a sort of evolution on the sender side, the bees could have, so to speak, hijacked the propensity in the wasp for their benefit. But in this case, what we have isn't a signal. The rules followed by the wasp are unchanging. More research needs to be done on the wasp side of the signaling equation, on why the wasp responds the way it does to the shimmering, whether it's due to the information it carries or due to some pre-existing propensity.

Summary

Can groups engage in communication? Yes, they can. Not all talk of groups communicating must be explained away as metaphor or shorthand or just talk of group leaders – though, some cases still might fit that kind of picture better. There are interesting questions about how life fits into the model, whether something must be a living thing to be a sender or receiver, but the model seems to leave open the possibility that an ordinary biological make-up might not be necessary. We saw how groups led by committees and elected officials fit into the model and differ from groups led by individuals that are more tyrannical. And we saw how in paradigm cases of group communication what's going on can't just be reduced to the inner workings.

So, groups *can* engage in communication. Do they? The answer to this is yes too. Groups not only can but also *do* communicate. But what might seem like some of the more obvious candidates for group communication turn out not to be such good examples in practice – recall declarations of war. Other cases seem to provide better examples – sanctions. The animal cases provide room for even further research.

I chose to examine the idea of group communication for a number of reasons. Among those that, as I tried to show in the introduction to this chapter, people often talk about groups communicating, even people doing high level academic, policy, and journalism work. What's more, people disagree about this way of describing what's really going on, choosing instead to look for other explanations, thinking that what's going on can't really be communication at the group level. What's even more than that, though, I wanted to look at group communication because of its seemingly broad scope. In this chapter, I focused more on politics, but group

communication seems to extend much farther. This brings me to the next chapter. There we will look at art. Also often talked about as being involved in communication, and often created by groups – movies, for example, or ballets - it's a natural next topic. The only reason I didn't include an in-depth discussion of art in this chapter is that there is also so much art that is *not* done by groups, that is, this done by single artists. I thought more appropriate to set the stage first with our understanding of group communication generally and then look at art as a whole later.

Chapter 3. Art and Communication

3.1 The Universal Language

One thing often thought to distinguish humans from other animals is the creation and consumption of art. Our lives are surrounded by and deeply influenced by art. What is it about art that makes it so important? Often pointed to for an answer is art's apparently symbolic nature, its trafficking in things such as meaning and symbols. Indeed, many artists and thinkers have expressed the view that art or some form of art is in some way a form of language. French artist Jean Dubuffet (1901-1985) writes, "Art is a language, an instrument of knowledge, an instrument of communication" (Roth & Roth, 1998, p. 14). American jazz pianist and composer Herbie Hancock says of music that it "truly is the universal language" (Childs, 2010, para. 3). Others, however, don't see the strength similarity between art and language. British philosopher Gregory Curry (1993), for example, worries that films simply don't have the features that make language the complex and interesting thing that it is. Movies carry meaning, he would say, but not in the same way sentences of English do. Still others have noted the neglect of art in the literature on communication generally. John Dewey is a notable exception to this. In his book *Art as Experience* (1934)*,* he writes about art that it is "the most universal and freest form of

communication" (p. 275). Some pages later he writes that art is "communication in its purest

form," and, "the most effective mode of communication that exists" (p. 286). Other philosophers

have also seen art as a form of communication: David Hume, Immanuel Kant, and Leo Tolstoy

to name a few. But to say that art is *language* has been another challenge. So, there is a two-part

challenge here. To show that art really can be considered communication (at least in some cases)

and how that works, and to show that art might sometimes be considered a form of language too.

Part of the problem in exploring these questions is that even what counts as art is a hotly

contested topic. A van Gogh is art but what about a Duchamp or a Pollack? Art critics now

agree on these latter cases, but it wasn't always that way and plenty of everyday people still

disagree about them. How about the drawing I did when I was in 1st grade – was that art? This

question about what counts as art is an important worry. But rather than try to answer this

philosophically prior question, I'll try to stick to the one about communication and focus

primarily on the generally accepted cases – though, I will make some speculations about a few of

the harder ones.

Is art a form of communication? If so, what does it communicate and how does it work?

Some cases are more obvious. Literature, for example, uses words and sentences. Here I'm

interested in the less obvious cases. Some art seems clearly communicative, but what about the

Duchamps and Pollacks? What about music without lyrics? What about art that doesn't rely

primarily writing or speech? And is at least some art not just communication but *language*?

3.2 A First Sketch

On the sender-receiver model, what is important is the co-evolution of sender and receiver communicative behaviors, rules for sending and acting upon signals. So, when investigating whether some form of art might count as communicative, we need to see whether we can't find a good analogue in there for these parts and processes.

I start with a simple case to show that it's *at least possible* that some non-linguistic art is communicative – note I do not take this case to be representative or paradigmatic of most art; it's just a simple example to get us started. Suppose I lose my cat and want help finding him but don't have any photographs of the little rascal to put on a missing cat sign. Instead, I might choose to draw a picture of him, especially if he has some unique features (only three legs, a unique fur pattern). How I draw the cat will take into consideration how I think people will interpret what I put on paper – "will it be obvious that this is supposed to be a stripe in his fur and not just a mistake in my rendering?" Receivers, people who see the sign, will have to recognize what the artist is trying to convey. I might ask a friend before putting up the final version whether he has any input on how to better convey my subject. If someone calls me and brings me the wrong cat, I might edit my drawing, or they might adjust their interpretation.

As I said, I don't mean to give the impression that this sort of case is paradigmatic of art. I don't mean to suggest here that I think the usual communicative purpose of art is simply to carry information about some object or person. The cat drawing is not made to be *appreciated* and *assessed* which seems to be a common feature of a lot of art and something I'll get into in more detail in a moment. The cat drawing, as I've imagined it, is purely informative. But art that is intended to be purely or partly informative, particularly in terms of identification or

description, is not rare. Consider, for example, what is known as *expedition art.* A good case is the Easter Island painting done by English artist William Hodges (1744-1797), who was employed as a draughtsman on Captain James Cook's (1728-1779) second voyage to the South Pacific.

Figure 3.1. Hodges, W. (1776). *A View of the Monuments of Easter Island [Rapanui]* [Painting]. National Maritime Museum, Greenwich, London, United Kingdom. https://collections.rmg.co.uk/collections/objects/13275.html

These works were meant to act more like photographs (albeit, sometimes a bit embellished) more than anything else. They were usually quite technical and meant to help those back home see what a place was like. Portraits of people or animals could also serve this purpose. English ornithologist John Gould's (1804-1881) drawings of Darwin's fiches seems a good case.
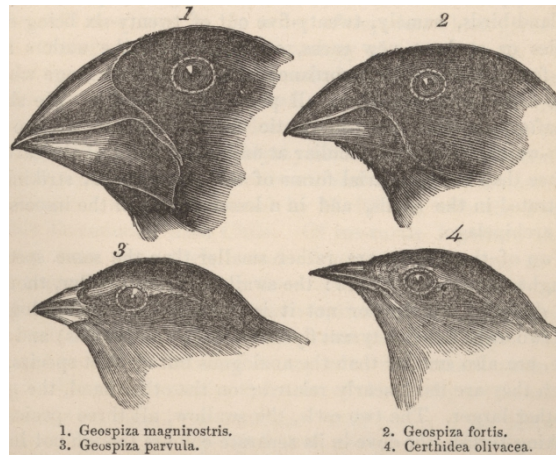
Figure 3.2. Gould, J. & Gould, E. (1845). *Darwin's Finches* [Lithograph]. From *Journal of researches into the natural history and geology of the countries visited during the voyage of H.M.S. Beagle round the world, under the Command of Capt. Fitz Roy, R.N.* (pg. 379), by Charles Darwin, 1845, 2d edition. London: John Murray. http://darwin-online.org.uk/content/frameset?pageseq=1&itemID=F14&viewtype=text

The point is to show what the finches look like, not so much to impress the viewer or any other thing a work of art might do.

Now let's get back to the drawing of the cat. Conventionality is important for communication too. Is there room for conventionality in the cat drawing case? I think so, but it will come in degrees. There are many ways – within certain bounds – to draw the same cat and represent it through some sort of iconic relationship à la Peirce. Some ways of drawing the cat might be more abstract than others. Some might involve odd uses of color. Some might be more cartoonish than realistic. And yet, what exactly the "certain bounds" involved in such a case are I find hard to say. How far can the picture be distorted until it's no longer recognizable as being of a cat? I'm not sure. Part of the boundary will be determined by the psychology of receivers, but this almost certainly isn't the full story. Cultural norms of depiction might play a role, for example. I won't try to make further guesses here.

Figure 3.3. Portrait of Rene Descartes. Hals, F. (1649). Portret van de Franse filosoof en wiskundige René Descartes (1596-1650) [Painting]. Musée du Louvre, Paris, France. Retrieved from Wikipedia Commons: https://commons.wikimedia.org/wiki/File:Frans_Hals_-_Portret_van_Ren%C3%A9_Descartes.jpg

Figure 3.4. Portrait of Daniel-Henry Kahnweiler. Picasso, P. (1910). Daniel-Henry Kahnweiler [Painting]. The Art Institute Chicago, Chicago, Illinois, USA. Retrieved from Wikipedia Commons: https://en.wikipedia.org/wiki/File:Picasso_Portrait_of_Daniel-Henry_Kahnweiler_1910.jpg

Godfrey-Smith (2016) points out that some art might not be so conventional. According to American evolutionary ornithologist Richard Prum (2013) art has an *evaluative* aspect to it. As I hinted at earlier, one aspect of art seems to be that receivers are meant to assess a piece at least partly for its *beauty*. For Prum, beauty is the key evaluative property, and it's something he thinks is evaluated by humans and animals alike – consider the male Peacock's tale and its

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evaluation by potential mates. In cases where something is made purely to be evaluated,

Godfrey-Smith thinks there is no possibility for replacement (as compared to the potted plants in

the Woodward case – something other than a potted plant could serve the communicative

purpose in that case, say, a lawn chair). What matters in instances of art meant to be evaluated

for beauty is something intrinsic to that piece itself, not just the information about the world the

piece might convey. I mostly follow Godfrey-Smith on this, but I think he and Prum have

missed something more basic. I think *some* art has this evaluative aspect, this concern with

beauty, but other evaluative properties are possible. Consider pieces such as 15th century Dutch

painter Hieronymus Bosch's (1450-1516) *Hell* (1490-1510), 20th century American painter Ivan

Albright's (1897-1983) *The Picture of Dorian Grey* (1943-4), and 20th century German artist

Otto Dix's (1891-1969) *Wounded Man* (1924) (Figures 3.5., 3.6, and 3.7).

Figure 3.5. Bosch, H. (1490-1510). *Hell* [Painting]. Web Gallery of Art. Palazzo Ducale, Venice, Italy. Retrieved from The Web Gallery of Art: https://www.wga.hu/frames-e.html?/html/b/bosch/

Figure 3.6. Albright, I. (1943-4). *The Picture of Dorian Grey* [Painting]. The Art Institute of Chicago, Chicago, Illinois, USA. Retrieved from Wikiart: https://www.wikiart.org/en/ivan-albright/the-picture-of-dorian-gray-1944

Figure 3.7. Dix, O. (1924) *Wounded Man (Autumn 1916, Bapaume)* [Etching]. Museum of Modern Art, New York, NY, USA. Retrieved from Wikiart: https://www.wikiart.org/en/otto-dix/wounded-soldier

These works seem to be made with the intention that they depict the *ugly*, that they be grotesque, macabre, and disgusting – *not* beautiful. We can evaluate these paintings for the skill of the artist in rendering something so gross. We can evaluate how beautifully they have rendered something so ugly. Some art is beautifully ugly in this respect. But this does not seem to be the same sort of evaluative beauty that Prum is considering – or at least it is not clear that it is or is not. I take the evaluative aspect of art to include paintings of this sort too.[76]

Getting back to the cat case - the drawing of the cat - that case was just one simple case to get us started, to see that it's at least possible for something that might be considered art to play a communicative role. Now let's looks at a few particular examples.

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[76] Prum also thinks that the beauty aspect of art comes coupled with a desire for *continued association*. I think probably this is not always true either. Consider that some people become jealous of the beauty of others and as a result do not want to associate with them and may even want to destroy that beauty (as might be the case in some instances of mate competition).

3.3 Paintings, Drawing, and the Like

People usually seem to think of paintings or drawings first when considering art. This form of art seems to go back at least as far as 60-70k years go (Hoffmann et al., 2018). Might drawings and paintings fit the sender-receiver model? We've already seen the cases of the cat drawing and the expedition art and finch drawings. But there are other things paintings can be used to *depict*. They can be used to depict certain events – for example, American artist Grant Wood's (1891-1942) painting *The Midnight Ride of Paul Revere* (1931).

Figure 3.8. Wood, G. (1931). *The Midnight Ride of Paul Revere* [Painting]. Metropolitan Museum of Art, New York City, NY, USA. Retrieved from Wikipedia Commons: https://commons.wikimedia.org/wiki/File:Midnight_Ride_of_Paul_Revere.jpg

Paintings and drawings can also depict what we "see in our minds" to some extent - the things we make up in our imagination or perhaps even hallucinatory experiences. Take, for example, some of the psychedelic art of the 1960s or attempts by various artists to depict the visual distortions caused by migraines. Here is an example of the migraine case. This piece is from English physician Hubert Airy (1838-1903), who published the illustration in an 1870 article in the *Philosophical Transaction of the Royal Society*.
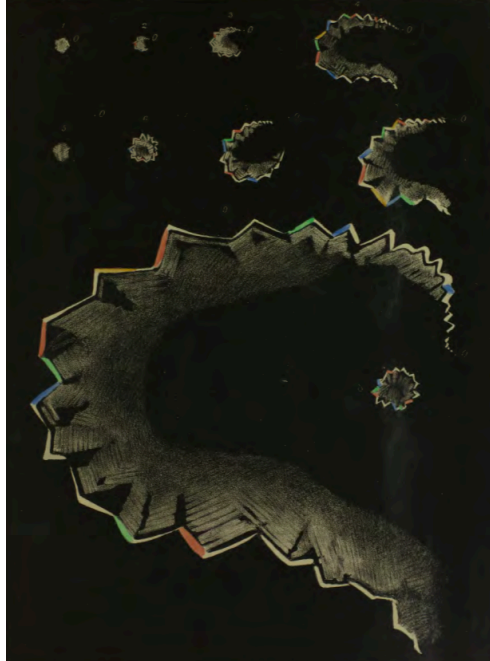
Figure 3.9. A work depicting a Scintillating scotoma aura – a visual symptom commonly experienced by some migraine patients - and how it grows in the visual field over time. Hubert, A. (1870). Plate XIII. "On a distinct form of Transient Hemiopsia". *Phil. Trans. R. Soc.*, *160*. https://royalsocietypublishing.org/doi/pdf/10.1098/rstl.1870.0013

And yet, there are many different renderings of Revere's ride, many different ways people have tried to depict hallucinations and migraines. The same thing can be drawn or painted in different ways, with water color, oil paint, acrylic, India ink. Even a finch can be drawn in different styles or poses and still get across the same subject. There is conventionality in depicting art, but, again, there will be bounds. Go too abstract and although the painting may be – according to the artist – of a dog, it won't look anything – by most peoples' standards – like one. Go too abstract with a landscape, and before you know it, viewers won't recognize it as such unless perhaps given an appropriate title.

I mentioned style. Style is important here. While discussing artifacts, American archeologist Philip G. Chase (1991) distinguishes between what he calls "active" and "passive"

style. Passive style occurs when, for example, all the boats made by a certain group of people look a certain way, are made out of certain materials, purely because that's the way the tribe members know how to make boats and those are the materials available. Active style happens when the choice of materials or shape is deliberate in some sense, when these are not the only materials or forms around and yet they are selected anyway. A shift from passive to active can happen over time. A tribe might make a boat a certain way and this is noticed by members of another group. That other group takes the passive style as a sort of cue of the identity or tribal affiliation of the occupant of the boat. The boat builders of the original tribe might notice this habit of interpretation, and so in turn produce boats that way – despite other materials or forms being available – because of the role the style plays in identity.[77]

The same can happen with art – not that boats like the ones just mentioned might not be art in some sense. We can usually recognize a van Gogh (1853-1890) or Monet (1840-1926) or Klee (1879-1940) through their style. In some cases, this is active, in others passive. Artists of a certain school might passively paint in similar ways simply because that is the only way they were taught or the only way they saw their mentors doing it. Others might try to more actively copy a certain style despite being aware of other options – van Gogh imitating Japanese art for a while might be an example. Of course, one might also try to create one's own style and continue creating art that way for identity signaling purposes too. And then there are passive cases that come around for other reasons. The bluish hues characteristic of later Monet paintings might be an example of passive style. It's been suggested that his painting this way later in life – painting his white lilies with a blue tinge and so on - might simply have been due to his now seeing more ultra-violet colors after having his lenses removed during cataract surgery (Zimmer, 2012). A

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[77] For a similar story involving hand-axes, see Godfrey-Smith (2014b).

similar story might apply to van Gogh's so-called "yellow period". It's been suggested that the

halos around the stars in *Stary Night* (1889) and the seeming yellow filter to Van Gogh's other

works during this time might be the consequence of digoxin intoxication – a drug his doctor

might have been treating him with – which can result in symptoms of xanthopsia (yellowish

vision) and coronas (blurred rings around lights) (Lee, 1981).

That's enough for style for the moment and basic depicting functions. Each of the cases

of art we've just discussed, and the functions those works play, fit somewhat well into Lewis's

original model. Are there more abstract examples, though? How do they fit in? American neo-

expressionist artist Louisa Chase (1951-2016), who paints semi-abstract, highly colorful pieces,

describes her work as "a constant search to hold a feeling tangible" (Anderson-Spivy, 1991).

Figure 3.10. Chase, L. (1991). *Swimmer* [Painting]. Honolulu Museum of Art,
Honolulu, HI, USA. Retrieved from Wikipedia Commons:
https://en.wikipedia.org/wiki/Louisa_Chase

One plausible rendering of this idea might be that what is communicated in her pieces is an inner

state of the artist, a feeling. This is in the range of what is known as an *expressivist* view of art.

Russian author Leo Tolstoy (1828-1910) famously held a view like this in his 1897 book *What is

Art?* For Tolstoy, art is a skillfully crafted embodiment of the emotions of the artist used to

convey those emotions to an audience and get them to experience those emotions themselves. John Dewey articulated a similar view in *Art as Experience* (1934). There Dewey set out the view that roughly the point of art is to get the viewer to experience something, though unlike Tolstoy, Dewey didn't limit this experience to expressions or emotions. For Dewey, art functions as a sort of focused experience generating machine, where the point of the experience in art is basically the same as experience in the rest of life: to help us grow, to gain or learn something that will help us deal with the practical world and each other. As I see it there are a few things going in here: 1. Art as a product of expression. 2. Art as representing emotions (or in Dewey's case, possibly other things). And 3. Art as a thing that causes emotions in others (or in Dewey's case, other experiences). Here's what seems like a possible story that combines these elements – focusing on the part about emotions. A sender creates something as a response to an emotion they are experiencing or experienced. Then that thing is a sort of natural sign of that emotion – this is a primarily left-hand side sender set-up. But then receivers start to notice these sorts of things, and senders notice that receivers react to it in such and such ways and so on. Senders then might in turn start producing these things in more refined ways to better get across that content. All the while it could be that receivers have a tendency on their side such that when they see something, say, "sad", that they feel sad, there is some sort of tendency to empathy or something like that, and perhaps the more "sad" looking, the more they actually start to feel sad. But it also seems plausible these things could occur separately. A sender might never refine the products but just keep making them and with no intention of anyone receiving them and no sensitivity to feedback – then, again, we have more of a cue. Someone might be trying to represent an emotion but not make someone experience it – I might try to represent sadness without making you sad. Or perhaps an artist might try to get you to experience something

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partly through, again, tendencies for fear, excitement, etc. on the receiver side rather than through conveying any information. A similar story could be told for works that convey or bring about other experiences, experiences without such a strict focus on the emotional sider of things.

The degree of conventionality in cases like these is not as clear as in others. Can the same experience be created by different works? In some cases, changing one square millimeter of color on a canvas might not matter for the overall generated experience, maybe not a square inch, or foot, and so on. But in other cases, that square inch might be a big deal. Consider Italian artist Leonardo da Vinci's (1452-1519) *Mona Lisa* (1517). The painting is only 2′ 6″ x 1′ 9″.

Figure 3.11. Da Vinci, L. (1517). *Mona Lisa* [Painting]. The Louvre, Paris, France.
Retrieved from Wikipedia Commons:
https://commons.wikimedia.org/wiki/File:Mona_Lisa,_by_Leonardo_da_Vinci,_from_C
2RMF_retouched.jpg

If one square inch of the painting was replaced with a red square, I take it that would radically alter the work. People would wonder about the red square - why it was there, what it meant.

Change the direction of the subject's gaze or alter the subtle smile, and you can radically alter the work too.

Now consider Spanish artist Pablo Picasso's (1881-1973) *Guernica* (1937), which is supposedly about the bombing of the Spanish town of the same name in April 1937 by Nazi Germany and Fascist Italy at the request of the Spanish Nationalists. This painting is 11′ 6″ x 25′ 6″. Here, one square inch might not matter much if at all.

Figure 3.12. Picasso, P. (1937). *Guernica* [Painting]. Museo Nacional Centro de Arte Reina Sofía, Madrid, Spain. Retrieved from Wikipedia Commons: https://en.wikipedia.org/wiki/Guernica_(Picasso)#/media/File:PicassoGuernica.jpg

There are other limits to conventionality here. Surely, another painting could be made depicting the bombing of Guernica, but Picasso, with his style and color choice, seems to bring something else to the piece. Now it's not just a matter of making a new painting of the bombing; the content of the painting includes more than that – though, what the entire content of the painting is isn't clear. I think in some cases, what a piece contains in terms of content won't be something we can fully capture in human language, at least not in a few sentences. Here, the content seems to include, probably among other things, things like mood, an attitude toward the

event (namely, that it was chaotic and bad), and of course, it also, through Picasso's signature style, has a mark of identity to it – Picasso's identity as the work's creator.

Another role a painting might play is captured in a quote from American illustrator Norman Rockwell (1894-1978), who once said of his work "I paint life as I would like it to be" (Rockwell, 1960/1979, p. 24).

Figure 3.13. Rockwell, N. (1943). *Freedom from Want* [Painting]. Story illustration for The Saturday Evening Post, March 6, 1943. Norman Rockwell Museum Collections, Indianapolis, IN, USA. https://www.nrm.org/2016/11/freedom-want-1943/

What we get here is a sort of "way of life" as part of the content of his paintings. He's showing us a way things could be and the way he would like them to be. What counts as the appropriate receiver action in the Rockwell case might not be difficult to imagine – perhaps he is trying to encourage his audience to help bring about the sort of world he's depicted, which would involve performing certain actions to bring about certain states. This wouldn't fit into the original Lewis model, however, as Lewis didn't intend the way someone desired the world to be to count as one of the states senders observed, but it can fit our more fleshed out extension of the model.

Now how about the works of artists such as Kandinsky or Pollack or Duchamp? Are more abstract and modern pieces such as these signals in some sense as well? Perhaps, but I'll admit that if so the content of some works and how receivers are supposed to respond is not totally obvious. Duchamp (1887-1968), with his "readymade" pieces was supposedly trying to make a statement about what counts as art. Perhaps it's fair to say in his case then that the appropriate response for receivers was a reconsidering of what art is and what sort of behavioral outputs going forward will count as fair play in the art game. Perhaps something else could have sufficed other than the urinal or the bicycle wheel – a cooking pot? It's hard to say – hard for me anyways.

Kandinsky (1866-1944) held quite explicit views about his art. Despite the abstractness of his later work, he reportedly saw his paintings as actually being about certain things. His first seven *Compositions* are supposedly about a coming apocalypse for example.

Figure 3.14. Kandinsky, W. (1913). *Composition VII* [Painting]. The State Tretyakov Gallery, Moscow, Russia. https://www.wassilykandinsky.net/work-36.php

In this case, we have a sort of signal but what it is about is a certain predicted future state and what it seems to suggest for an action on the receiver side is preparation. Kandinsky also

described the artist as someone *causing* an experience in his audience – in that case, we're back to Dewey.

Jackson Pollock (1912-1959) was fairly silent on the meaning of his pieces. Some say the paintings convey a sense of energy or athleticism with their paint splatters and slashes.

Figure. 3.15. Pollock, J. (1950). Autumn Rhythm (*Number 30*) [Painting]. Metropolitan Museum of Art, New York, New York, USA. Retrieved from Wikipedia Commons: https://upload.wikimedia.org/wikipedia/en/f/fa/Autumn_Rhythm.jpg[78]

That sort of content is more along the lines of a cue, though – unless, of course, Pollack noticed this connection and so purposely exploited it, but it's not clear whether that's the case. If he exploited it in order to bring about an energetic feeling, we have a Dewey sort of situation.

What we get is that paintings and the like may have many different roles – some having to do with communication, some not - and those roles might sometimes be intertwined. For a final case of painting, consider Navajo (Diné) sand painting. The sand paintings may depict a god, person, animal, etc. but the purpose of the painting is beyond depiction. These paintings are sometimes said to be considered living beings themselves. Others describe them as gateways for the spirits (Parezo, 1981). Suppose the purpose of the work is not so much to get a message

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[78] This work originally appeared with the title "Number 30". Later it appeared under the title "Autumn Rhythm" with no explanation for the change. The piece is now exhibited under the combined title.

across (even to the gods) as much as to function as a portal to the spirit world, or to conjure up the spirits and harness their power - its purpose would still be fulfilled, presumably, even were no-one, even the gods, observe it. In this case, what we're dealing with is something fairly far away from a standard case of communication.

Is there any sort of structure to paintings and drawings, any sort of organization as in human language? Consider again the finch drawings. These seem to have a fairly obvious sort of structure. There are parts and the parts (or some of them) map fairly systematically to parts of the bird in the real world. Where the beak is drawn relative to the eyes matters, *arrangement* matters. The shading of the ink corresponds systematically to the lighting of the bird. What we seem to have is a *combinatorial encoded* signal. Move the parts around and the drawing seems to be of something else, to have a different content, even though the parts might have the same content and the same parts might be present. The case can even be embellished and made more complex in a number of ways. As discussed, style might come into play. Other things might be done to alter the mood – the color tone of the painting might be slightly altered. There are many possibilities.

How do much more abstract cases work? That is harder to say. We discussed the Picasso piece a bit. But a piece by, say, Pollack seems a bit trickier. Here the work seems to have parts and the way those parts are combined and arranged and their color seems to matter to the overall effect, but it doesn't seem that the individual parts *stand for* something in the way the shading of the finch's beak or the beak itself does. I can imagine a case, however, where an artist is trying to get a certain feeling or emotion across and exploits the tendencies in audiences to react emotionally to certain colors, combinations, and arrangements of those colors to make an

abstract painting that conveys that feeling. In that case, there is a sort of structure - the arrangement of the colors, the combinations, and what colors are used matters - but what mapping is being used isn't so clear. Does the color map to something like mood? As in the way dark paintings tend to have a dark mood and light paintings a levity to them (which is not always true)? Or does red map to anger or passion? What about the shape of the parts? Do they express something like the energy of the painting – as when jagged lines make a piece feel frantic or long gentle wavy lines makes it feel mellower? And how does arrangement work here? If Kandinsky pushed the majority of his shapes and lines into one corner of the canvas would that give it less of an explosive feel? Would it give the painting a sense of being off-balance? I think the answer is that each piece will have to be determined on its own merits. Some cases will feature parts where the arrangement of the parts matters, some will have parts with systematic mappings, and some cases will simply be less complicated forms of communication. It all depends on the drawing or painting. The lesson here regardless is that some drawings and paintings indeed can be considered not only examples of communication but also *language* – at least, if we consider a signal that is encoded and compositional or encoded and combinatorial language – at the very least some art makes the mark of what we in Chapter 1 called syntax.

This discussion of structure and conventionality brings another point into focus and it's the last I'll discuss before moving on to other art forms. Go back to Gould's finches. These pictures were drawn for science, to be descriptive, and part of what makes a description a good description is *accuracy*. I see a few different ways accuracy of a sort might play a role in art. One is descriptive. A painting or drawing might more or less accurately depict how something looks by exploiting systematic mappings between features of the subject and things like what

colors are used on the canvas and where (so red paint for a red feathered area). Another place accuracy might play a role is in art involving emotions. I think this could work too, probably with some sorts of systematic mappings, but as I admitted in the discussion about compositional signals and emotions just a few paragraphs ago, how exactly that sort of thing might work is less obvious in these cases. I'll talk about two more ways accuracy can play a role in communicative art. Consider the famous painting *A Sunday Afternoon on the Island of La Grande Jatte* (1884-1886) by French artist Georges Seurat (1859-1891), which now hangs in the Art Institute of Chicago (Figure 3.16).

Figure 3.16. Seurat, G. (1884-1886). *A Sunday Afternoon on the Island of La Grande Jatte*. [Painting]. Art Institute of Chicago, Chicago, IL, USA.
https://www.artic.edu/artworks/27992/a-sunday-on-la-grande-jatte-1884

At first glance this seems to be a very detailed painting, and in some ways it is. But if we look closer, we see that not all these people are so detailed as we might have first thought. Take a closer look at the small child in white for instance (Figure 3.17).

Figure 3.17. Close-up of *A Sunday Afternoon*. (Adapted from Figure 3.16).

The child isn't even obviously a child anymore. Do they have eyes? A nose? Ears? In the case of paintings and drawings, the *resolution* or *level of detail* will come in degrees.[79] In different works descriptive accuracy, emotive accuracy, and resolution might diverge. A picture might have extremely high resolution but be a poor depiction of the event (for example, a doctored digital photo). A work might be a great rendering of a certain feeling but a less accurate depiction of what an event actually looked like (Picasso's *Guernica*). A painting might lack resolution but otherwise render a person fairly well as far as systematic mappings of colors and other features go (think a blurred image).

Now I bring up resolution to highlight the last way I wanted to talk about accuracy playing a role in things like paintings and drawings. Suppose I am tasked with producing a depicting painting of a person and my painting is fairly accurate in terms of mappings from colors of the subject to paints and the shape of the subject to brush strokes on the canvas *but* I don't include all the freckles on their face. On the one hand, this could be simply because I'm not crafting a piece to that level of detail, then we have a resolution issue. But sometimes artists

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[79] This example was inspired by a TED Talk given in 2003 by Dennett.

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simply leave details like these out, not because they aren't working to that level of detail, but because for whatever reason they see that detail as one not needed for the purpose of that drawing, or perhaps they simply don't have the needed color on hand. Then the lack of some feature is not a resolution issue, and what's more, it seems the work can still be a work *of the same subject* despite the lack of certain details. The same seems to be the case the other way around. I might draw my grandmother's house and put seven trees in the front yard instead of six. I do this simply because I'm trying to show there are a decent number of trees in the yard and I don't know what the actual number is. The drawing is still *of* my grandmothers' house despite the extra tree. How this sort of thing works will depend on the work at hand. Some works might involve sender and receiver rules that allow for these sorts of "less precise" mappings, others might not. We'll see these issues crop up again throughout this chapter and in Chapter 4 when we talk about maps.

3.4 Song and Dance

Of course, painting and drawing are not the only forms of art. Song and dance play a significant role in our lives as well, and often the two are combined in one performance – as is the case with many Broadway musicals, ballets, and even the Hopi snake dance. Music and dance have been considered forms of communication of their own for some time. 19th century American poet Henry Wadsworth Longfellow (1807-1882) once wrote, "Music is the universal language of

mankind" (Longfellow, 1835, p. 202). "Dance," American modern dance choreographer Martha

Graham (1894-1991) states, "is the hidden language of the soul, of the body" (Graham, 1985).[80]

A bit of a preface before we go on: here I'll focus primarily on works performed by one

sender or will for purposes of flow of explanation at this point make the idealized assumption of

one sender. I'll focus on cases involving two or more individuals and the details that come with

that later.

Songs seem particularly well situated for an analysis in terms of signals, especially vocal

songs, or songs *a cappella*, that is, without musical accompaniment. These songs are, after all,

made up primarily or entirely of words and sentences with prior meaning. Some songs seem

pretty straightforward. Some tell a story – Peter La Farge's (1931-1965) "The Ballad of Ira

Hayes" (1963) seems like a good example. The point of the song is to let people know what

happened to Ira. Each line of the piece adds to the story – though, there is repetition in the

chorus. Other songs might instead explicitly express how the singer *feels* – "I'm So Tired"

(1968) by John Lennon (1940-1980) seems like an instance. But the meaning of a song is often

more than just the meaning of each word or each verse. No single line, for example, of Bob

Dylan's "Blowing in the Wind" (1963) or The Animals' "Sky Pilot" (1968) or Pink Floyd's "Us

and Them" (1973) may explicitly state that war is bad, but each of these songs as a whole are

taken to be anti-war pieces. What senders do in these cases is use arrangements of parts already

meaningful in other contexts and perhaps their connotations to craft a "bigger" signal with a

larger message - almost like moving images around on a collage. And yet, other things may be

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[80] Graham goes on to say two more interesting things in this quote. 1. that she thinks dance might be able to express some things words cannot, and 2. that she suspects dance might be the first art form, given that gesture (a relative of dance, she says) is so primitive.

added to amplify or modify the message. A sincere tone as opposed to a sarcastic one will radically alter a song and how receivers react to it. There are obviously more details, but I think to hope for a precise semantics of songs is a bit hopeful. Too many things can be added. Little tricks and possible features – for example, falsetto – show up in songs every day. This is simply to say that what role a song plays will be determined by more than just the function of the parts or words of already existing signaling systems the song borrows from, it will also depend on how those pieced together words are sung (sincerely vs sarcastic; fast vs slow; with emotional pain vs pleasure), how they are pieced together (in normal sentences or more abstractly), and many other things.

There are cases of vocal singing, however, that do not involve words – at least in the usual sense. How do these work? One example is "lilting", a traditional form of singing performed in some Gaelic speaking parts of Ireland and Scotland. The "lyrics" are typically what we would consider nonsensical. One verse in the classic Irish jig "The Queen of the Rushes" is roughly "Lidle dee doodle dee, Lidle dee doodle dee, Lidle dee doodle dee, Lidle dee dah". This is repeated over and over again. The word-like sounds produced by mouth are used more like notes on an instrument than the way words are used in a Johnny Cash song. And the singing is usually done in a very rhythmic way, sometimes with many people joining in and accompanied by dancing or foot stomping and knee slapping. Could this fit the model? I think so, though the story will be fairly complicated. There are many things the lilting seems to be doing. One function could be making a rhythm for dancing – as it is often accompanied by this. Here we have a case like the one where the coxswain calls the stroke but doesn't do any rowing himself. Is there anything more to this case? Here, the rhythm is for dancing and entertainment, not for completing an ordinary task like rowing, and it seems plausible replacing the lilting with

a metronome wouldn't really work in the usual context. It appears the melody or something else in the lilting rather than the rhythm it creates is important here too. Perhaps the melody works to bring about a good mood in listeners à la Dewey. But whether it does, and if so, how exactly, I'm not sure. Perhaps the melody represents the mood *and* brings about the experience of a good mood. Perhaps it brings about the experience through representing, or perhaps it does it through a physical or psychological tendency in receivers.

But lilting is also sometimes done without dancing, albeit still in a group. Here it seems one plausible option could be that lilting is a way for people to come together and share an experience, knee slapping and all, a signal serving a sort of unifying function along with the rest of the ritual (more on this sort of idea later). This use of lilting, it seems, would also be a kind of act-to-act signal, but it would be a peculiar one: it seems it would be one where the signal itself, or the creation of the signal, is part of the act performed by receivers, who in this case it turns out will also be senders. Without more empirical research on lilting, it's hard to say what's actually going on in these cases.

Scat singing in jazz is a case that is somewhat similar to lilting but probably better known to those in modern society. According to American ethnomusicologist Paul Berliner (1994), scat singing might have originated when jazz musicians attempted to sound out musical notes or rhythms to themselves or their band mates before playing attempting to play them. In that case, scat functions as a representation of the sounds of other instruments in an iconic sort of way. This fits the Lewis model. But this intuitively is not the purpose of scat singing as we actually see it in most modern jazz. Here's what seems plausible. Musicians could have noticed that this "scatting" (used originally to sound out musical notes) sounded cool in its own right, and so then

incorporated it into their music, not because it sounded like a particular instrument or made do for when the drummer wasn't around, but because it was aesthetically interesting to them in its own right. Then scat singing can function as more than a representation of the sounds of other musical instruments. But then, in that case, what function does scat play? What does it signal? I think in that case, scatting is like playing an instrument, and so it will have a similar range of possible signaling functions just as other instrumental pieces might - say, expressing a feeling, or bringing about a feeling in the audience, or, if part of a larger piece, then contributing to the larger whole.

I'll discuss two more forms of vocal singing that don't obviously feature lyrics before I move on to looking at the case of instruments. Yodeling, as it is usually recognized, is agreed by researchers to have originated in the Central Alps. Supposedly, it was originally used as a way to call in herds of animals or to communicate the yodeler's location to other people in the remote region.[81] Why the characteristic modulation in pitch found in yodeling? Usually this was simply to make the yodel easier to hear at great distances. But sometimes modulations came to be made in certain ways so as to serve as a sign of the sender's identity – this was common in forms of yodeling known as "lailing" and "huving" found in Norway".[82] It's easy to imagine a back and forth here. A sender yodels a certain way to let someone know where they are. Others do the same. With other yodelers out and about it's hard to tell who the person sending a yodel is. One sender happens to modulate his yodeling in a unique way, and this allows receivers to identify the sender. The sender notices this and so makes sure going forward to yodel with the appropriate modulations. These cases - communicating location and identity, or calling in a herd

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[81] Other forms of yodeling exist elsewhere – for example, in Persia and Central Africa - suggesting the independent emergence of yodeling of some form in different populations (Plantenga, 2012).

– are fairly simple examples that fit the Lewis model. In the location case, however, the content will be partly cue-like. Sending a yodel from a particular location is a natural sign of your (or someone's) physical location there.

The last vocal case I'll look at is throat singing. Mongolian throat singing involves producing multiple guttural sounding pitches simultaneously for long durations, sometimes with modulations or even a sort of whistle produced in part by thrusting the jaw forward while exhaling. Singers use circular breathing to maintain the singing. How could this be an instance of communication? Despite originating in a remote landscape similar to the Alps, throat singing is not thought to have been used for location or herding as yodeling was. Rather, Mongolian throat singing in its different varieties is thought to have been intended to mimic the sounds of nature, things like the songs of birds, the wailing of a winter storm, or the plaintive cry of an animal (Levin & Edgerton, 1999). In this case, throat singing seems to have an iconic function. But who is the receiver? What is the relevant action? It's only very recently that throat singing has started to be performed solo and on stages in big cities. The traditional animist worldview of Mongolians is relevant here. They are said to believe that nature, animals, plants, all these things, not only have spirits, but also express that spiritual power sonically. Humans can assimilate this power, they think, by imitating those sounds (Levin & Edgerton, 1999). In this case, the singing is not a signal and instead seems closer to a sort of tool for accessing certain spiritual powers, a key for unlocking mystic doors – much like the case of the Diné sand paintings.

The throat singing performed by the Mongolians is primarily practiced by the men, supposedly due to beliefs about it causing infertility or miscarriages in women, though

apparently the prevalence of that belief is changing.[83] There is another kind of throat singing: that of the Inuit, which instead happens to be performed mostly by the women. This form of singing sounds to the untrained ear a bit like someone hyperventilating, but it is much more complicated than that and in an eerie way quite beautiful. Singers stand face to face holding hands and square off trying to match breathing and vocal rhythms until one of them misses a beat or can go no longer. The singers take turns. When one goes silent, the other vocalizes both through inhalation and exhalation. Back in the day, the singers used keep their lips very close using the mouth of the other as a resonator. The practice originated as a game the women played for entertainment while the men were away hunting, but over time the singing became more stylized and regimented. Is this signaling? At the start, it seems odd to call it signaling. It seems more like a game of skill that just happens to use vocals. But over time the vocals came to be valued for, as with the Mongolian version, things like their similarity to the sounds of nature. Now we have singers producing a sound a certain way, sometimes with an iconic relationship, because they know that it will be evaluated by observers for these features. Unlike the Mongolian case, however, the point of mimicry does not appear to be spiritual. One story that seems possible is that the more similar to the sounds of nature or the more difficult to perform, the more impressive to observers the singing is. This would be a sort of mix of roles, where one of those – impressing by talent – gives the signal a sort of natural-sign like content. But nothing here seems to make the singing count as signal, as actually communicating something in the strict sender receiver sense.

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[83] Despite my efforts, I have not been able to find any discussion of *why* the belief that a connection between throat singing and infertility exists.

Vocal music, though, only makes up one form of music. There is also instrumental music – music played on a piano or violin, for example. I think music of this sort can work as a signal as well. A song can have a sort of mood – it's a sad song, it's a happy song it's a trippy song. Following Dewey, someone might express their mood through the music, and how they do it can be calibrated by how receivers react. If receivers feel uplifted after a performance of what was supposed to be a sad song, then the pianist might have to alter his playing – what matters is the experience generated in receivers by the art piece. As I mentioned earlier, another similar but different version of the view focuses on the song's faithful representation of the emotions of the sender and not so much on the experience the song produces in receivers. In the case of music, this sort of view is represented by Deryck Cooke (1911-1976) in his 1959 book *The Language of Music* – a very controversial book among aestheticians.[84] This sort of situation – a song meant to *show* how I feel but not necessarily make you *feel* as I feel - would seem to fit the Lewis model too. Again, think of a painting of someone who looks sad as opposed to a painting that makes you experience sadness. This doesn't preclude the two from being combined in one piece or from the former perhaps causing the later. But it does seem at least possible in some sense that the two might be separated. In the case where a song simply makes a receiver experience sadness but doesn't do anything else, I don't want to say that what we have is a signal - this is more like the case of the wine discussed in the first chapter.

As with paintings and drawings, there seems to be room for conventionality in songs. The same role might be played by different songs, or different instruments. Remember on the sender-receiver model, conventionality is a key aspect of signals. "Over the Rainbow" (1939), might have basically the same effect – at least to me - when played on ukulele as when played on

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[84] Mainly controversial because many aestheticians doubt that there is a language of music.

piano. Both "The Unknown Soldier" (1968) and "Eve of Destruction" (1964) can express the very rough message that "War is bad". But, again, there will be limits too. Change the notes just a bit too much, change the key of a song, and you can change the effect of the whole thing.

How about a few more complicated examples? Consider Russian composer Sergei Prokofiev's (1891-1953) symphony *Peter and the Wolf* (1936)*.* Here music is used in at least two interesting ways. Each character is represented by an instrument – Peter by the violin, the wolf by the French horn. And each instrument is played in a way that represents the character's current situation in the story – if Peter is running, the violin playing is hurried, for example. In the first case, we have music working as a marker of identity. In the latter, an iconic relationship is being exploited - the resemblance between hurried instrument playing and hurried movement. Combining the two gives us *Peter running*. What we get is an interesting sort of structure to the song that adds to the larger message. Add on to that that the order, the sequence, in which things happen in this song is important – as is the case with many other songs – and we seem to have an example of a song that is *encoded* and *compositional*. We seem to have a case of a song that fits many of the markers researchers care about when they talk about syntax and language.

Of course, in this case, the music had a more *explicit* structured signaling function. It was intended to convey information in this systematic and organized way. But as we've seen with other songs we've discussed so far, a sort of structure is present in many of these cases too. Changes in key can change the meaning of a song, changes in pace, changes in how the parts are played, the *order* in which the parts of the song are played usually matters. How loudly and intensely some instrumental part is played may correspond in some systematic way to the

intensity of some emotion, perhaps. Many different things can be combined to ultimately determine a songs content.

For another example, consider Hungarian composer and pianist Franz Liszt's (1811-1886) *Hungarian Rhapsody No. 2* (1847). The order of the parts of the song seem to matter to some extent. The song would sound weird and chopped up if its parts were moved around. Does each instrument or note correspond to something? Not obviously. But the *lassan* of the song, the first part, is generally agreed to have a dark and melancholic mood, and this seems to be due to the pace of the instrumental playing and the use of C-sharp minor as the home key.[85] The *friska* part of the song on the other hand, the second part, is in C-sharp major and later F-sharp major and is fast and often loud, and is generally thought to have a playful or happy and energetic mood.[86] In the friska the use of C-sharp major and F-sharp major seems to give it it's lighter mood and the fast playing seems to give it it's feel of energy and playfulness. Here the pace of the song seems to map systematically to feelings of energy and the keys seem to map to something like mood. Liszt's use of what's known as the "gypsy scale" in the song also seems to bring to the composition a connotation of Hungary – one of the places where such scales were often heard in local music, especially the folk music. Here we get a song that seems to be reminiscent of Hungary and represents the somberness and the playfulness of the place at that time, an attempt to capture the ethos of 1800s Hungary. What we get is a song that seems to be a

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[85] A *lassan* (Hungarian for "slowly") is the slow part of the Hungarian folk dance called the *csárdás*. Most of Liszt's Hungarian Rhapsodies get their inspiration from this dance.
[86] The *friska* is the fast part of the *csárdás.*

case of an *encoded compositional* or at the very least an *encoded combinatorial* signal and not

one that is so, for lack of better words, explicit in its structuring as the *Peter and the Wolf* case.[87]

In short, a sort of syntax seems to be possible in music as in spoken and written language.

Some cases will be *encoded* and *compositional* like supposedly paradigm cases of language.

Many cases, however, I think, will probably fall closer to something like an *organized*

combinatorial signal, or an *encoded combinatorial* one.

Earlier we saw examples of signals with a sort of act-to-act character to them. Is there

anything like this in music? There seem to be a couple close fits. Going back to vocals for a

moment, one example here seems to be what are known as "work songs", where these are not so

much songs *about* work – though sometimes they are – as much as they are songs used to help

facilitate work. These pieces are usually *a cappella* and provide a rhythm by which the task at

hand can be coordinated. Examples include marching songs, sea shanties, rowing songs, and

chain gang music. Here again roles are mixed. The songs typically have a larger message or

story but they primarily serve the function of keeping the beat, the rhythm. For an example

involving only instruments, consider drums. These are often used to keep a beat in various

songs, acting as a sort of act to act coordinator for the band members. Drums are also used for

beat making in dances and in rowing. Also consider war drums, the kind carried on the

battlefield by the British and Colonial Armies during the American Revolution – these were used

to keep marching pace and sometimes give orders. Or for an ancient example, take the *taigu*

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[87] Another song that has sometimes been thought to describe a place in a similar manner is Italian composer Luigi Boccerin's *Musica notturna delle strade di Madrid* (1780). This song is thought by some to be reminiscent of the night-time streets of Madrid, Spain.

drum of the Chinese and Mongolian armies. These too were used primarily for keeping

marching pace (Norris, 2012).

I'll take a look at a few more cases of music before moving on to dance. Conch shells

have been used as instruments of sorts since at least Neolithic times, and we see them appear in

many different cultures. In pre-colonial Tahiti, the conch was used for a variety of purposes,

though I'll only discuss a few here. One appears to have been to announce or call Tahitians to

major ceremonies (Hedley, 1896).[88] In the book *The Sacred Chank of India* (1914), English

ethnologist James Hornell writes of the conch being used this way in that country: "From the

earliest times the conch has also been used in India to call the people to their sacrifices and other

religious rites…" (p. 124). This sort of use fits the original Lewis model. The state is the

occurrence of a major ceremonial event, the sender is the organizer, the receiver is the other

members of the group, and the action is preparing for or attending the ceremony. A somewhat

similar and more western example might be the tolling of a church bell, used for much the same

purpose. Or, for a military example, the use of bugling for announcing various events and

rotations.

William Ellis (1794-1872), an English missionary visiting Tahiti in the early 1800s,

mentions the conch also being used, among other things, as a sort of battle cry: "The sound of

the trumpet, or shell, a species of murex, used in war to stimulate in action… was more horrific

than that of the drum" (Ellis, 1829, p. 283). The drum Ellis is speaking of here is the Tahitian

drum – but more (again) on drums in a moment. Ellis speculated that the haunting sound of the

conch was partly intentional. Pointing out that the larger shells seemed to make the most

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[88] Maclean (1999) discusses other uses.

ominous sounds, he writes in his journal: "The largest shells were usually selected for this

purpose. (p. 283). Here we have a shell being chosen for the effect it has on listeners – in this

case, presumably fear on the side of enemies. A similar case from the mythology of ancient

China involves the army of the Yellow Emperor using drums of walrus skin to frighten the tribal

leader Chiyou's soldiers and put his army in disarray (Filipiak, 2014). We have a sort of

feedback, a back and forth, and yet part of what is being taken advantage of is a psychological

tendency. In the case this is all that is going on, we don't seem to have a signal – again, we have

more of a wine case. Calls like these, though, are sometimes used with dual purpose, with

members of one's own group in mind as receivers too. Sometimes these calls also serve to

motivate and inspire one's fellow group members – hence the "stimulate in action" part of the

earlier quote. The infamous rebel yell of the Confederates during the American Civil War is a

good vocal example. The point was to scare the enemy and to raise the moral of one's fellow

soldiers. There could be a back and forth here as well. What we seem to get is a signal with

different possible roles which could occur combined or separately. But this "motivating" and

"stimulating" use is *also* not a signaling use. Again, it appears to be a wine case, a taking

advantage of a psychological tendency. We can get a communicative use, however, if those

signals – the conch, shell, or yells - were also used, say, to act as a declaration of violent action.

Then we get sender-receiver style signaling.

Let's take a look again now at drums. Drums occur in many cultures and perform many

different jobs. We've already briefly looked at their use in coordinating playing instruments,

dancing, and marching, but for a more explicitly communicative use of drums, consider the

"talking drums" used in pre-European West Africa and Papua New Guinea. These fit the model

too. The most common kind are known as "slit gongs", consisting of a long hollowed out log

with a slit along its length upon the edges of which players hit their mallets. The sound can travel for miles, even through the thick jungles. In the case of the Kele people of the Congo, their spoken language is tonal and rhythmic, and what they apparently did is mimic the tones and rhythms of their language with their drum playing (Finnegan, 2012). This is an interesting case in that what the group in effect did was transfer a signaling system over to a new but similar context, from one instrument (the vocal cords) to another one that sounded similar and had similar available moves (the drums). They did this when they could have instead just come up with a whole new convention when it came to communication with drums. Messages conveyed by the signaling system could even apparently be as complicated as, for example, "The missionary is coming up river to our village tomorrow. Bring water and firewood to his house". In the Kele case, the drum "words" corresponding to the spoken words, were in some cases modified to reduce ambiguity in the message, such as by repetition. Eventually the drum language became somewhat unique from the spoken version although still very similar (Carrington, 1949). Here it seems we also find a case of an *encoded compositional* signal.

That's a lot about music. Let's turn now to dance. Dance is rather old. How old is unclear, but rock art on some cave walls in India seems to suggest dance might go back as far as 30k years ago (Mathpal, 1984). And it comes in many forms. The primary "sign vehicle" here – to use one of Peirce's terms – is the movement of the body and its parts. Since there are so many kinds of dance and no one kind of dance seems to be archetypal, I'll just dive into a few examples, some fairly common, others less often discussed.

Consider rain dances, performed all over the world but most famously by the indigenous peoples of the southwestern United States. Here the point of the dance is to bring about rain –

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these performances are sometimes called "rainmaking" ceremonies. Are these dances instances of communication? There seem to be a few options here. Suppose a dance is simply intended to *modify* the weather, perhaps similar to a very elaborate turning of the knob on a thermostat. In this case, it seems fair to say we don't have an instance of dance as communication – there's no back and forth. What brings about the rain is the physical (or mystical) effects of the dance, not some communicative aspect of it. But suppose that the case is more like that of the Hopi Snake Dance. During the Snake Dance, performers wear traditional ceremonial clothing and sing and chant while carrying live rattlesnakes. Hopi legend has it that the dance serves as a prayer for rain, the message of which the snakes then carry to the gods who, like the snakes, live underground (James, 1990). In this case, things are complicated. There is an attempt to communicate – a dance is being performed for the snakes and in turn the gods (both intended receivers) and there is an intention that a message get across. But is the attempt successful? Is there some sort of feedback between senders and receivers – between dancers, snakes, and the gods? It's not clear. The Hopi might take the regular correspondence between their dance and the subsequent occurrence of rain as evidence of their attempt at communication being successful and this might reinforce the dancing behavior on their side (the sender side), but whether this is actually good evidence of communicative success is doubtful. We'd need to see evidence of reinforcement and the like on the receiver side.

Earlier we looked at music meant to strike fear in an opponent or to motivate one's group members. A case that is similar to this, and which combines movement and vocalizations, is the War Haka (*peruperu*) of the Māori of New Zealand. This ritual, invoking stomping and loud shouted vocals, was performed primarily to intimidate the enemy. But in this case, the signal also takes advantage of natural sign or cue-like information coming from the sender side via the

actual viewing of physically intimidating and well-coordinated warriors performing the dance.
An observer is intimidated not just by the sounds and movements but by seeing the muscles and
size of the warriors. So, it is not quite a paradigm case of signaling in the Lewis sense.

An additional cue-like content might be possible for the Hopi Snake Dance too. It takes
guts to hold a venomous snake such as a rattler, and so by performing the dance performers also
demonstrate their bravery. Other cue or natural sign-like options seem possible. Some dances
are highly sexualized and may partly serve to display sexual information, including information
about the dancer's body. I'll discuss cases in this area in more detail later in this chapter.

One thing that seems fairly common in other forms of art is iconic sign use. Is there
anything like this in dance? We often see masks used in plays, or elaborate costumes. One
example I think worth looking at is the Chinese Lion Dance. There are different variations of the
dance, and no one is really sure of the exact origins or original purpose, but the dance in present
day typically involves as its centerpiece a gorgeously constructed fake lion operated by two
dancers wearing it like a costume. In some sense the lion seems to have a sort of iconic function.
It is meant to *look* like a lion and is in fact described as such. But why make a lion costume and
dance in this way? Some have suggested that the purpose of the dance is to ward off or scare
away evil spirits (Wang, 1985; Schrempf, 2002). Assuming that this is achieved through the
dancers looking and acting aggressively like a lion and that similarity scaring the observing
(receiving) spirits, then it seems like we have something more like a psychological tendency
being taken advantage of than an actual case of signaling. There isn't really any back and forth
here. It's more like the wine case.   There is a back and forth between human observers of the

dance and the look of the lion, and yet, the human observers are, according to the legend, not the main intended audience.

Other cases of dance with costumes seem to fit a little better and also seem to have some similarity to the *Peter and the Wolf* case. Consider something like a narrative ballet such as the *Snow Queen* (1844) or the *Nutcracker* (1892). Here dancers are dressed to represent characters and the dancers act out the actions of the characters, in effect creating a representation of the event before receivers' eyes. This is somewhat similar to Peter being represented by the violin and his actions being represented systematically by the violin's playing. There are many ways to convey information about an event, but dances and songs such as these seem to take advantage of tendencies in us to use iconic similarities and to try to make sense of things in narrative form. There's a sort of structure here: the combination of masks or costumes identifying characters, the manner in which the characters dance, and the order in which parts are played out. In most cases there will be more to the mix than this. And there could have been and probably was back and forth here too. Does that dancer look enough like a queen that the audience will recognize her as such? Does Hercules killing the lion in scene one and coming out wearing a lion skin in scene two get across that the lion skin is from the lion he killed earlier? Do people interpret my dancing this way as representing the character as ecstatic? Either way, what we appear to get here is not just a case of a dance being communicative, but of dancing having an *encoded compositional* structure. We appear to have a case of dance that hits the key marks of language too.

Narrative ballets and dances are very much like standard plays and films. A lot of the same principles will apply. Since we'll be talking about films explicitly later, I'll hold back on mentioning more in this area until we get to films specifically.

Some dances that appear to be communicative are harder to explain. Yvonne Rainer, an American post-modern dancer, has a dance called *Trio A* (1978) that involves no sound from the dancers and no musical accompaniments whatsoever – a completely (or nearly completely) silent dance. About the dance, she has said, "[It] would be about a kind of pacing where a pose is never struck," and "There would be no dramatic changes, like leaps. There was a kind of folksy step that had a rhythm to it, and I worked a long time to get the syncopation out of it." (Rainer, 1999, p. 64). There is a sender here and an audience, but what exactly the response in receivers is supposed to be or what function the dance plays is unclear – at least to me, that is. Perhaps it is more similar to the Duchamp case, where maybe the point or at least one point of the work is to disrupt contemporary artistic conventions or to say something in a sort of meta way about dance itself.

A final way we might think about dance being communicative comes to us from Scott-Phillips (2012). He considers "partnered dancing", dancing where there is a lead and a follow. This sort of dance he thinks fits the ostensive-inferential model of communication:

> But a better way to think about lead and follow is in terms of the inferential model. The lead provides evidence for what they have in mind for a section of music (different moves, or movements), and they might do this in a number of different ways (for example, a longer stretch, or a delayed movement). These differences can be of various sizes, and if they are sufficiently large then fluent

users of the language would identify the two different forms as distinct things.

Just as the same word can have two different meanings, even in the same context,

if it is produced with two sufficiently different tones of voice, the same movement

can communicate different things to a follow if it is produced in two different

ways. For their part, followers must take the evidence the lead has provided, and

choose how to interpret it. Certainly, there is scope for creative interpretation, just

as there is in language. Some followers are rather literal in their following, but the

very best play a more active role: there is almost always more than one way to

interpret a lead, and the best following involves making those choices as best to

fit the moment. (Phillips, 2012, Part 2)

This is an attractive story. But Scott-Phillips also mentions that he doesn't think the code model

can cover the case, and yet he doesn't give an actual argument for why he thinks the code model

– or for our purposes, the sender-receiver model, a form of the code model – doesn't work in this

instance. I think he is wrong and that the sender-receiver model can cover it. Read his passage

again and then recall our discussion from Chapter 1 on the code model, context, and things like

sarcasm. The sender-receiver model will allow for the sort of moves Scott-Phillips is describing

here. In dancing, a "longer stretch" or a "delayed movement" can work as a signal and can have

associations with certain desired moves in certain contexts. There could be feedback. A sender

might notice receivers react to certain moves in certain contexts in certain ways, and so take

advantage of that. A receiver might notice that a sender follows up certain moves in certain

contexts a certain way and try to adapt to that, and so on. The sender-receiver model seems to

fit.

When we talked about drawing and painting, we also talked about accuracy. Does anything like that make sense in song and dance? I think in the case of songs there are a few ways this can work. The first obvious way is storytelling music. Songs that tell stories can tell more or less accurate stories. This is similar to our depicting case of accuracy in the drawing and painting case. And this kind of accuracy in music need not be in vocal form either. A song structured like Peter and the Wolf could potentially be used to describe real events and would depict things simply instrumentally via systematic mappings. Accuracy involving the depiction of emotions seems to have a place in song too, potentially using systematic mappings to things like those discussed just a moment earlier in the Liszt case – minor chords, tempo, etc. Is there room for the sort of imprecision we saw in drawing and painting? Definitely. A guitar player might accidently play an extra note or leave one out; the note's presence or absence need not have great significance and need not be a result of something like poor acoustics, audio quality, or fidelity.

How about dance? A narrative dance like a ballet seems like an obvious case where something like an event can be more or less accurately depicted. And this could involve the use of systematic mappings – mappings of dancers to subjects, movements of dancers to movements of people, etc. In the emotive accuracy case, mappings might be possible in dance too – slow movements to sadness, and so on. Imprecision is just as possible here. In some cases, for example, the Hopi rain dance, if certain moves aren't made, then the dance has been performed incorrectly, it's not *the* snake dance. But in many other cases of dance, missing a step, an arm movement, simply won't matter or won't be features that should be taken to have some significance, it will still count as the same dance.

3.4.b. Scores

Go back to music for just a moment. We looked at some of the ways songs, the combination of sounds, can work as signals, forms of communication. But what about things like music scores or sheet music? Or the very basic sequence of chords I write down on a notepad for the little song I've just started coming up with? Do things like these count as signals or communication?

Two people who have looked at this issue are American philosophers Nelson Goodman (1906-1998) and Daniel Miller. Goodman's view, expressed in his 1968 book *Languages of Art*, is that music scores *identify* particular musical works. Goodman writes:

> "A score, whether or not ever used as a guide for a performance, has as a primary
>
> function the authoritative identification of a work from performance to
>
> performance." (p. 128)

So, a music score, on Goodman's view, primarily lets you know whether this song you just heard was an instance of Bach's *Preludium in E Major* or not or some other song or not. How does it do this? Goodman's account is somewhat complicated, but the short and simple version appears to be that what's important is conventional notation and symbol combination. There are atomic symbols - individual symbols such as the eighth note symbol (Figure 3.18.) and staff lines (Figure 3.19.) that can stand for individual things: how long to play a note and at what pitch.

Figure 3.18. A traditional
eighth note symbol.
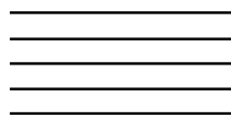
Figure 3.19. Staff lines.

And then there are *compounds* of these atomic symbols. Scores, on Goodman's view, are one

large compound symbol. Conventionally mapping these atomic symbols together, we can get a

musical score that picks out a particular song (Figure 3.20).

Figure 3.20. An example of a music score. Based on Herbie Hancock's "Watermelon
Man" (1962).

A number of philosophers have been critical of Goodman's view. The first trouble is the lack of

detail. How is it that combinations of atomic symbols work in this case? How does order or

arrangement play a role? Do systematic or sequential mappings matter? What kind of

conventionality is important? Goodman doesn't really give an in-depth analysis of these

features. Another problem with Goodman's view is how strictly he requires a performance to

adhere to a score to count as an instance of it. Goodman writes:

> "Since complete compliance with the score is the only requirement for a genuine
>
> instance of a work, the most miserable performance without any actual mistakes
>
> does count as such an instance, while the most brilliant performance with a single
>
> wrong note does not." (p. 168)

He seems to require *perfection* when it comes to following what is written down. Perhaps in a very strict sense this conception of what counts as an instance of a song might be right, and in some cases strict adherence to performance might matter (for example, in certain ritual ceremonies or music school exams), but it also seems common not to lean so heavily on rigidity of performance. Jimi Hendrix's performance of the "Star Spangled Banner" (1969), despite its extreme deviations from the traditional score, is still, I think, worth considering a performance of the "Star Spangled Banner" (1814) - just an altered one.

There have been other criticisms of Goodman's take on scores. Ziff (1971) and Webster (1971) argue that Goodman's account fails to reflect the meaning and actual usage of scores. Elkins (1999) argues against Goodman's requirement that symbols be "indifferent" – that is, that an atomic symbol not play two communicative roles at once. Virginia Anderson (2014) notes that Goodman's account doesn't seem to adequately handle graphic scores, scores representing music using symbols and methods outside standard music notation. Here is an example of a graphic score due to American composer John Cage (1912-1992).
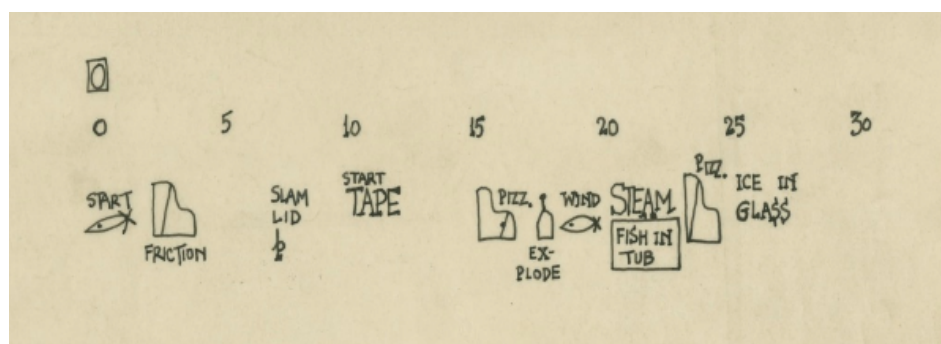
Figure 3.21. A section of the score for *Water Walk* (1959). Cage, J. (1959) Water Walk [Score]. New York Public Library, John Cage Unbound a Living Archive. http://exhibitions.nypl.org/johncage/node/22

More simply, though, I think Goodman's view is problematic just from its big picture idea. *Identifying* a performance of a song really just doesn't seem to be the "primary" purpose of some piece of musical notation, or at least that doesn't feel like the best or most accurate way of talking about things.

Miller (2017) discusses music scores in the context of discussing *maps*. I don't want to get into an analysis of maps yet, since we'll do that in detail in Chapter 4 as well as discuss more of Miller and Goodman's ideas about maps there. But I think it's worth taking a look at what Miller thinks musical scores do – as far as communication goes - and how he thinks they do it, returning to the map side of things later. Here are some examples of what Miller says:

> … the notational symbols of scores constitute just one of multiple modes of representation and depiction harnessed by this framework. (p. 1)

> …scores represent an array of highly structured acoustic morphologies and performative actions through two-dimensional, visual conventions. (p. 4)

There are other quotes that give a bit of further insight into Miller's view, but I'm afraid ultimately his take on things is not very thoroughly worked out. He isn't clear on exactly what the purpose of a musical score is, whether it's primarily descriptive or tells the reader to do something or both. I should mention he readily admits this in the article, that he isn't going to have space to work this all out. What he does say about "depiction" and "performative actions", however – as seen in the quotes above - suggests that maybe he thinks a combination of these things is what matters, or that maybe one matters sometimes and the other in other situations.

My take is that things like scores and even the notes on the notepad are signals and that they usually primarily communicate instructions, that is, that they generally are used for guiding action. A quarter note placed on this line here in this place means roughly something like "Press down on *this* key of the piano like *this*". When I write down a G major chord on my notepad, I'm telling myself that this is what comes next in my playing pattern when I want to play this song on guitar again later. They are instructions I can write for myself or for others. Depending on the way some score is used, I can even see how there might be a sense in which a score can work as a sort of external form of *memory*. I write a score to be used by myself at a later time, since I know I won't remember how to play the song all the way through. Or I can write a score on a more durable sheet of something or try to preserve it in some other way so that future generations might use it to learn to play the same music.

This last example seems to offer something that gets somewhat close to a "depicting" use of scores. How might something like that work? One way a score might be depicting in a sense is if there is some *state* it is about. One way I could maybe see that working is if a work in some way communicates what I "have in my head". I have a song going on in my head, I want to write down some notes for it so I can try and play it on the piano later. A similar case is a musician attending a concert and writing down on his notepad a score for one of the new songs he just heard. If the musician then turned around and used that written score to help him play that song later, then I think we'd have a case with the scale leaning more toward the action side than the description side as far as content goes. But suppose the musician wrote the score down, not because he had any intention of ever using it later to play something, but because he had made a bet with the composer that he could figure out the composer's song and he wrote it down

to show the composer after the concert. Then we seem to have a case with a balance more toward the descriptive side.

Another case closer to the descriptive side is seen in the graphic scores of German designer Rainer Wehinger. In the 1970s, Wehinger created a graphic score – she called it a "Hörpartitur" or "audio score" – to accompany the electronic composition *Artikulation* (1958) by Hungarian composer György Ligeti (Figure 3.22).
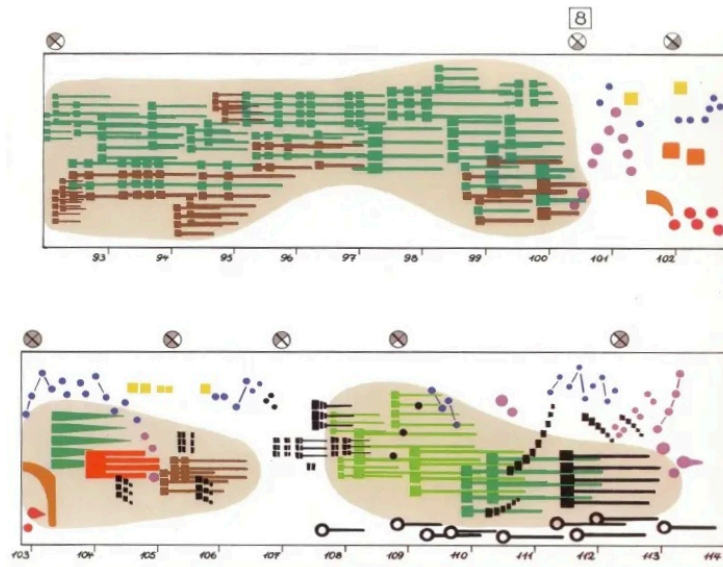
Figure 3.22. Audio score for *Artikulation.* Wehinger, R. (1970). *Ligeti - Artikulation: Elektronische Musik - Eine Hörpartitur von Rainer Wehinger* [Score]. Mainz: B. Schott's Söhne.

This score seems to have been made *primarily* with a descriptive role rather than a prescriptive one. It seems to be more suited to and intended for "following along" while listening to a song and making sense of what you're hearing than it does for being used to *play* a piece (Service, 2009). It's also rather aesthetically pleasing. And indeed, it seems some scores, especially graphic scores, are made with an evaluative purpose as one of, if not their primary, roles. So,

scores seem to be capable of being more or less descriptive or prescriptive. They also seem to be

able to be made to be *evaluated.*

But how is it that Wehinger's score is a score of Ligeti's song and not something else?

How does that work? There's another way scores might be interpreted to be descriptive in some

sense. Sheet music, tabs, even graphic scores contain some interesting features related to our

discussion of syntax in the first chapter. Consider this example of a guitar tab.

```
e ————————————————————————————————————————
b ————————————————————————————————————————
G ————————————————————————————————————————
D ————————7 4 / 5 5 5 5 5 4 2 / 4 4 4 4 4 2 0 0 0 0 0 —
A 4 / 5 5 5 5 5————————————————————————————————— 4
E ————————————————————————————————————————
```

Figure 3.23. A section of a guitar tab.

In this example, we have a column on the left starting with a lower case 'e' at the top and ending

with an upper case 'E' at the bottom. Each row in the column corresponds to a string on the

guitar. The bottom most row is the thickest string, the second row to the bottom corresponds to

the second thickest string, and so on. We have a *systematic* mapping. The letters, correspond to

the tunings of each string. Another systematic mapping. The '0' near the bottom left represents

playing the largest string of a standard 6 string guitar open (that is, plucking that string without

putting your finger down on any of the frets). Each number corresponds to the fret on which the

guitar player should press their finger on that string. Another sequence. And then we have the

numbers arranged in order of when they are supposed to be played relative to the other notes.

Another (temporal) sequence. We have a signal that tells a receiver what string to play, tuned to

what, when, and on what fret (if any). The '/' between some of the numbers tells the player to

"slide" their finger from the fret before the '/' to the one after it. Even more features can be added.

This example gives us an idea of the complex nature of something like this, how it can fit into the sender-receiver model and how it all seems to work. But it also shows us how these mappings and how they are arranged can in a way play a sort of depicting or descriptive role. They seem to capture something about their target domain, bear some sort of similarity. If you look at the tab, it is almost shaped like the neck of a guitar with how the strings are lined out.

This story is roughly the same for sheet music. Take a look at the sheet music for the Beatles song "Hey Jude" (1968).

Figure 3.24. Sheet music section. Based on "Hey Jude" (1968) by the Beatles.

The symbol near the bottom left that looks like two fours represents the time measure, or how many beats are in each bar of the song and how long a beat is. The top number represents how many beats per measure while the bottom number communicates, in this case, that each of those beats is a quarter note in length. A note having white in the middle rather than being all black represents a half note (in other words, half of a whole note, in the case of 4/4 time, the duration of 4 beats). A black note without the tail of the eighth note represents a quarter duration. The upward curved line stretching from "Jude" to right before "don't" is called a "tie" and is used to

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communicate that the two connected notes (of the same pitch) should be played as a single note lasting as long as the duration of the two notes put together. The little dot to the right of the hollow note indicates to add a duration of half the notes original length to its total duration. Each line and space on the sheet – in Western music typically 5 lines and 4 spaces - represents a different musical pitch, and it does this in a mapped and sequential order - a note's placement on the lines represents in effect which key on the piano should be played, keys that also happen to be organized in a sequential ABCDEFG order. The top set of lines in the score is for the right hand and the bottom line is for the left hand. The order in which the notes appear is mapped to the order in which they should be played. A receiver combines all these things to narrow down the right actions. Again, we seem to get examples of signals that are *compositional* and *encoded* and that seem to take advantage of some similarity between the way things are arranged in the signal and how they are arranged in the target domain, some part of the world.

Perhaps it's not surprising that this sort of thing can work in graphic scores too. In the case of Wehinger's design, there was even a key explaining the mappings.

Figure 3.25. The key to Wehinger's graphic score. Wehinger, R. (1970). *Ligeti - Artikulation: Elektronische Musik - Eine Hörpartitur von Rainer Wehinger* [Score]. Mainz: B. Schott's Söhne.

In the John Cage (1912-1992) piece from Figure 3.21, there was a sequential systematic mapping of numbers to time and from drawn instruments to instruments to be played. The flexibility in designing scores is a rather incredible thing. There's even a score out there now in video form due to Welsh musician Rhys Edwards (2020). In the case of Rhys's score, the similarity captured seems to be that between the rows of the amphitheater filmed and the lines of a stave and the location of the people walking up and down the rows of the amphitheater and the notes to be played.

Miller (2017) notices all this, how there is flexibility in score design and how there tends to be this use of certain similarities between scores and their songs, but he doesn't say much about it. He notes that American philosopher Elizabeth Camp (2007) talks about something like this in some of her work on maps, arguing that certain semantic objects, namely maps, mirror within themselves certain relations between parts of what they're about. She calls this feature of a signal "isomorphism". What is isomorphism exactly? This is a big clunky conversation and I'm going to hold off on that for now. Camp brings it up when talking about maps. So does Miller. Given this and that Chapter 4 is dedicated to maps, I want to wait on discussing this issue until then, until we talk about maps in more detail. Until then, I'd like to discuss one more thing about scores and then move on to the art form of film.

How does sheet music differ from the actual song played? I think scores differ from the music that is actually produced in that scores are a set of instructions for how to produce the music – it's not the other way around (at least, not usually).[89] The music that is played is what carries some additional communicative purpose or function. Take, for example, the use of

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[89] I'm assuming it would be possible to make a song that tells the listener how to write itself down to be played later.

trumpet flourishes, sometimes called "fanfare", to notify guests of an event of the arrival of a particular guest of honor such as a Queen. The fanfare might communicate the overall message that the Queen has arrived. It might have the function of announcing this kind of event. But the sheet music does not seem to do that or have that function, and it seems it wouldn't be enough on its own to do that or be the right kind of thing to use for that purpose. And that seems to be how things typically will be. I think the distinction is further seen when we consider that it seems extremely rare (if it ever even happens at all) for someone to write a score down and consider the job done as far as adequately expressing themselves. There is, I wager, usually an expectation that what is written down will eventually be used to *play* the song. Though, I suppose I can imagine someone who can no longer play for some reason but who wishes to express themselves musically and feels able to do that through writing scores. But I think this would be a rare case and an odd one. Moreover, there are other considerations for the separation between written music and played music. Sheet music need not be written at all for some song with a certain meaning to be played. The fanfare can go on even without the sheet music being used – one simply need remember how to play the song; in other cases, a new song with no sheet music yet might be used instead. Sheet music is really a kind of middle man and side case when it comes to music. Important in some cases, but not the same thing. A similar story will apply, I think, to the relationship between things like scripts and plays and written choreography and actual dancing.

3.5 Statues and Monuments

One salient form of art is the statue, monument, or sculpture. These go back at least 30,000 years. Statues are interesting because they are often public and also often *of* someone or something. Consider the Lincoln Memorial in Washington D.C. or the statue of Duke Kahanamoku in Honolulu. Could statues of at least some form be communication?

I think the answer to that question is yes. There is a sender (the sculptor) and a receiver (the private audience or the public). What is being communicated? In the case of something like the Duke or Lincoln statues, one thing that seems to be communicated is what the person the statue is of looked like. In this case, as with the finches, the location of parts relative to others will matter, their arrangement will matter, and the parts of the statue correspond to parts of the real person. Similarly, the lengths and widths of the body parts might map systematically to the lengths and widths of the real Duke's body parts. We get an *encoded compositional* structure, and, more than that, a three-dimensional one.

As with the other art forms we've already looked at, accuracy has a place in some statues and monuments too. Systematic mappings, such as that from the real arm length of a subject to the arm length of a statue's arm, can be exploited for the purpose of depictional accuracy. Emotive accuracy is trickier, but one way that might work is by mapping the facial expressions and positional body language of real subjects to statues. In the case of statues that are more abstract, I find it harder to speculate how this might work but don't rule it out – it could be something similar to the abstract painting cases, with certain shapes suggesting energy, etc. Regarding imprecision, there is room for that in statues and monuments too. Consider the monument of Martin Luther King Junior in Washington D.C. (Figure 3.26).

Figure 3.26. Dr. MLK Jr. Memorial in Washington, D.C. Shugarts, B. (n.d.). Stone of Hope 2 [Photograph]. National Park Service. https://www.nps.gov/media/photo/gallery-item.htm?pg=0&id=2D0217CA-1DD8-B71C-0772A0C13C24BBB1&gid=313AF650-1DD8-B71C-07476509DBD56534

In some respects, this work is extremely detailed. You can even see the individual lines on his knuckles and some of the veins in his hands (Figure 3.27).

Figure 3.27. Close-up of Dr. King memorial. Shugarts, B. (n.d.). Stone of Hope 1 [Photograph]. National Park Service. https://www.nps.gov/media/photo/gallery-item.htm?pg=0&id=2CF47D2F-1DD8-B71C-079F463EAF89C187&gid=313AF650-1DD8-B71C-07476509DBD56534

And yet, no matter how close you look, you will never see any of Dr. King's arm hair, freckles or moles, or the actual color of his skin. And this is not a resolution issue of the sort we talked about earlier. In Figure 3.26, he's also missing the rest of his legs. This is still a statue of Dr. King. Not every work is such that every detail need be included and not every addition or omission of some detail need have some significant representational purpose. In other works, this may be how things work, but the lesson again is that doesn't always have to be the case.

So, many depicting statues are not perfect copies of their subjects. But one salient and common way statues are often not perfect copies of their subjects is in terms of size or scale. The Lincoln statue, for example, is much bigger than the real Abe Lincoln. Same goes with the MLK Jr. memorial. Why might depicting statues deviate in this way from their counterparts in real life? Arguably, there is more to many statues that depict a person than *just* depicting them. Recent debates in the U.S. over Confederate statues offer some insight. There complaints were sometimes over how the statues "honored" or "glorified" those who enslaved others and those

who fought to maintain that system of oppression.[90] It was sometimes suggested that by having statues of these people in public, on such a grand scale, sometimes endorsed or funded by public institutions, we were putting them out there as role models, people whose values citizens should adopt and thereby whose actions they should emulate. In this case, we have something like a signal but the content is a mix of description and prescription – it tells viewers both what a person looked like *and* suggests to them what their values should be or what the values of the state are. Paintings, of course, can play this role too – the portrait of Moa Zedong that hangs in Tiananmen Square might be a good example or German-American artist Emanuel Leutze's 1851 painting *Washington Crossing the Delaware*. These cases, especially the statue cases, can fit the model, but they take us into group communication territory, and so, I'd rather hold off on talking about them more until I talk about other instances of group communication later in this chapter.

It's worth noting that this way of looking at statues and other "honoring" art is not new. American philosopher of art Noël Carroll has defended such an interpretation of some statues in his 2005 essay "Art and Recollection" extending the lesson to instances of just about every other kind of art too (poetry, film, novels, paintings, music) – the Liszt piece discussed earlier might be a good music example. "Memorial art," Carroll writes, "transmits the ethos of a culture. It celebrates the honored dead, underscoring their virtues, and calls upon the living to emulate them. The praise it lavishes on the deceased is intended to encourage later generations to be like them." (p. 8). Carroll points out this sort of art has often been neglected in the study of aesthetics and even considered *non*-art due to its memorializing function. I won't go into Carroll's arguments for this point – I encourage readers to take a look at his essay – but I follow Carroll in considering such art actual art too. Art can have many functions, and just because it was created

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[90] See, for example, Somin (2017) or Cooper (2017).

for a certain purpose doesn't mean it isn't art in the sense that most of us use when we talk about it. Carroll goes further with his analysis, however. He thinks not only is honoring art *art* and that art can play this honoring role, he thinks that perhaps art is one of the best tools we have for doing this. He writes, "It is not obvious that any other practice transmits the ethos of a culture as well as art does." (p. 9). He also believes that perhaps this is one of the best explanations for the continued creation of such art which is often expensive and requires great resources. I follow Carroll on this, and will address this latter issue in more depth later in this chapter.

Carroll also mentions a few other functions memorializing art might play. One of those is the intimidation of enemies and the building of confidence in group members. Carroll writes, "Many ancient war memorials celebrate strength, functioning both to terrify prospective enemies with the power of the ruler and to reassure the native populace that he has what it takes to defend them." (p. 13). This might be similar in some respect to the Haka case. Here there could be a sort of natural meaning coming from the piece. If a ruler or country is able to expend such great resources, command the creation and coordination needed to create such art, and has the skill to accomplish it, that gives off natural meaning regarding those things. But if the intimidation of enemies and the confidence building in the group members is done through the *depicting* that is going on in the piece, say of a strong looking ruler or of members of the group engaging in heroic or brave feats, then we get something more like a signal, something that is intimidating and confidence building through what it *depicts* rather than through what we can infer from it in terms of mutual information.

I'll consider one more of Carroll's suggestions regarding the function of memorial art. He says that some memorial art can function to "promote consolation and healing". He

considers war memorials in this case. "The memorial consoles the bereaved—both his immediate loved ones and fellow citizens who share their sense of loss—by reminding them that the fallen did not die in vain and that the living remain connected to them in the sense of owing them a genuine debt." Is this a communicative function? Here's how this might work. What these memorials might communicate is that this tragedy has happened, that these people have died and that the state recognizes this, remembers it, and will do what it must to make good on that debt. In that case, I can see how these pieces might console the bereaved - such a message delivered in simply the form of a sincere spoken statement from a leader of the state might help console the bereaved. But if these pieces console the bereaved and promote healing primarily through some other means, for example, suppose it is the process of constructing the pieces that consoles and helps heal, then we're not dealing with a signal – at least not in respect to that aspect of the piece. Some memorializing pieces might have a combination of these features. I might for example, gain some closure in part through the process of writing a eulogy for my grandmother while my family (the receivers) might gain some consolation through hearing the eulogy when I read it out loud at her funeral ceremony.

Another role honoring statues or other art might play, and one not discussed by Carroll, is a sort of *territory marking*. Consider again the Confederate monuments. A recent publication by the Southern Poverty Law Center (2019) reveals that most of these statues were put up in two specific time periods: in the 1910s and 1920s (the Jim Crow era) and later in the 1950s and 1960s, during the Civil Rights Movement. Their data also shows an increase in the construction of Confederate monuments on courthouse grounds after the landmark Plessy v. Ferguson case in 1896, which maintained state segregation laws, and an increase in the construction of monuments outside of schools after the 1954 Brown vs. Board of Education ruling, in which the

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Supreme Court decided state laws segregating public schools were unconstitutional. There are less complicates examples of statues that function to mark territory, but the Confederate statues seem plausible candidates for this function and I think are a very interesting case, especially given the recent protests over them. Many Confederate statues seem to have been erected at least in part to tell non-white members of the public that these places and these institutions were white and Southern. Other scholars have expressed this view. Writing about Confederate monuments in a 2017 article for *Politico Magazine*, American historian Adam Goodheart agrees. He writes, "Monuments mark public spaces like dogs mark trees: This place is *ours*, they say." (para. 16). Director of Hunter College's Roosevelt House Public Policy Institute Harold Holzer has expressed similar views, as have others.[91] Having the power to put those statues up in these places and to prevent others from taking them down revealed who was really in control and who wasn't in those areas, who these places served and recognized as citizens and who they in practice didn't. On this interpretation and the honoring one it's not surprising why former Soviet-controlled countries tore down the statues put up by the Soviets of Stalin and Lenin and why Germans took down Nazi monuments; and conversely why Confederate monuments have had such staying power in the South – the South is still largely controlled by white Southerners.

A similar story can be told for other instances of memorialization. For example, the naming of some U.S. military forts for Confederate Generals (for example, Fort Lee in Virginia), the naming of certain streets and highways (the Jefferson Davis Memorial Highway), and the redesigning of some Southern state flags to commemorate the Confederacy (see for example, the state flag of Mississippi). Then consider Mount Rushmore being built in the Black Hills of South Dakota, a place currently controlled by the U.S. Government but still claimed by the

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[91] Some of Holzer's remarks can be found in Stoilas & Stapley-Brown (2017).

Lakota tribe and still legally disputed to this day. Or look at the widespread renaming of mountains and other places in North America for white Americans (from *Tumanguya* to *Mount Whitney*; *Tahoma* to *Mount Rainier*). Or the statue of Christopher Columbus in New York City. The territory marking function can even be combined with the intimidation and in-group confidence building functions, which seems plausibly to have been the case with some Confederate monuments.

There's another sort of "honoring" way some statues seem to function. Many statues are made primarily for the purpose of honoring ancestors or gods. Are these communicative? In the case the ancestor is dead and there are no spirits or there is no god, then these would appear to be failed attempts at communication – a letter in a bottle with no one across the sea. There would have to be feedback, and I'm not seeing where that feedback might come from. There are other possible uses that wouldn't count as communication. Suppose the ancestors are alive or the relevant gods do exist but instead that what matters to receivers is simply that the statue was constructed and exists and not some information or content the statue might convey. Then the statue isn't being used as a signal – what is important mainly is the completion of some task by senders, like completing some chore to get a reward. Another possible non-communicative use can be found in the Moai of Easter Island and the Tiki of Polynesia. These are sometimes said to contain a power called "mana" when their construction is completed (Van Tilburg & Lee, 1987). Suppose someone created a Tiki solely for that purpose, to have an object containing mana, and that it having mana depended solely on the sculptor arranging the material in the appropriate way, not on some god or someone else observing that it looked right. Then, even if the Tiki happens to look like something or someone else, we have something that looks pretty far

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removed from communication - the similarity in resemblance plays no communicative role in the process.

A familiar form of monument, especially to those in the North Pacific region of the US and Canada is the totem pole. Totem poles play many different roles in the lives of various indigenous peoples of the Pacific Northwest, but I'll point out one in particular that seems to fit the model fairly well. Some totem poles are called "shame poles". These are carved to look like the individual being shamed and placed near their home or a public place (Barbeau, 1990). Until the person shamed pays their debt, the pole stays up. These are an interesting case in that the audience is not just the person being shamed, and it seems that the person being shame is supposed to act differently than other receivers: they are supposed to pay their debt whereas perhaps others are meant to help the sender shame the debtor into straightening up. There could have been a back and forth here. Poles that were more public and did a better job depicting the debtor in a poor light might have done a better job of conveying identity to and getting the attention of receivers. If receivers tended to react with laughter or ridicule more often to these sorts of totems and debtors with hurrying up and paying, then senders will be reinforced to keep producing totems this way, and eventually a convention will come about.

Since we still have much to discuss I don't want to spend too much time on statues and monuments. As I said, many statues are displayed in prominently public areas and so take us into discussion of group communication which I'm holding off on until later in this chapter.

3.6 Film

The newest of the art forms I'll discuss here is film. Some philosophers have wondered whether film might in some sense be a language. Since at least the 1920s it's been somewhat popular to talk about film this way. Silent films were thought to be particularly good cases for motivating the view, since despite the lack of explicit dialogue from the actors on the screen, even without subtitles, audience members were still able to understand the film's overall message. Film, it seemed, was a form of communication that transcended traditional barriers. Film functioned something like a universal visual language, or as Noël Carroll once put it, a sort of "celluloid Esperanto" (Carroll, 2005).[92] Even famed American film-maker Frank Capra (1897-1991) once called film one of the "universal languages" (Capra, 1971).[93]

Some contemporary writers aren't so keen on the comparison and consider it more or less obvious that there is no sort of language of film (Metz, 1974). Philosopher Gregory Currie is a good example here. In his 1993 essay "The Long Goodbye: The Imaginary Language of Film" Currie delivers what is perhaps the most comprehensive attack on the film as language hypothesis yet. Language, according to Currie, is among other things, conventional and syntactical, and, as he sees it, film just doesn't measure up to those standards. Unfortunately, as Currie himself admits, it is notoriously difficult to say what exactly language, syntax, and related notions really amount to - he prefers the broader concept of a "symbolic system". I too find it hard to say exactly what these things are, though I have tried to explicate them to some extent in the previous chapters. With that being said, I'll instead try to see how well film fits into the

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[92] See pp. 60-64 of (Carroll & Choi, 2005), for an introduction to the film as language discussion.
[93] The other universal languages, according to Capra, were music and mathematics. See Capra (1971), p. 205.

sender-receiver model way of doing things, and I'll see if it at least roughly matches what Currie thinks matters in making something a symbolic system.

Perhaps the first question to ask when trying to get a grip on the communicative role of something is to ask what its likely purpose is, why it is being made. There seem to be many options. Of course, making money is a part of the equation with many modern films (and art generally), and many films are created by more than one sender. But as with the case involving the drawing of the cat, here, simply to start us off with the possibility of film as a form of communication, I'll idealize that money isn't involved and that there is only one sender. I'll return to the issue of art with more than one sender later.

Many of the roles paintings can play a film seems to be able to play. A film, for example, can *depict* what a person or place is like or what's in my head. This has not been lost on other film-makers. In a *Rolling Stone* interview, Jim Morrison (1943-1971) says about film, "it's the closest approximation in art that we have to the actual flow of consciousness, in both dreamlife and in the everyday perception of the world." (Hopkins, 1969, para. 47). Other films seem more similar to something like a Rockwell illustration, showing what a filmmaker would *like* life to be like. For example, Capra's 1939 film *Mr. Smith Goes to Washington*, where Jimmy Stewart's character – the proverbial "little guy" of the story – wins out against the crooked politicians in the end. Films can also be mutually beneficial. A film such as *Schindler's List* (1993), a film that details the horrors of the holocaust, could potentially have a significant effect on the subsequent behavior of movie-goers, and this behavioral change can be good for both the creator (in the sense that they care about these issues and maybe have to live with the audience-goers as members of their society) and the audience in the sense that they hope to avoid the follies of

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previous generations, know what to look out for, and live up to the good values depicted. This is in line with the memorializing function of art discussed earlier. Another role films might play is to say that certain states of the world are *possible* in some sense, rather than that they have actually happened. Think of the 1997 film *Gattaca* and its underlying story about genetic discrimination. This film is interesting because it is partly a *cautionary* tale about the future. In this sense a film can serve as a sort of warning signal.

Films might also try to show a receiver what the right thing to do in a certain situation might be, or at least what the sender thinks the right thing to do is, where "right thing to do" might be in a moral or practical sense. These films might include heroes or exemplars, individuals whose behavior the film seeks to foster. Films like *To Kill a Mockingbird* (1962) might be an example of a movie attempting the moral version of this but the character involved need not be based on an actual person.[94] A somewhat similar use that seems fairly easy to read into film might be to communicate something like an "attitude toward life", a concept discussed by a number of philosophers in the 19th century, in particular Wilhelm Dilthey (1833-1911), and later sometimes by 20th century German philosopher Rudolf Carnap.[95] A film might communicate to an audience whether life is worth living (Capra's *It's a Wonderful Life* (1946)), whether the world is generally a rough place (think the old film noirs), or whether being optimistic is a better way to live one's life than cynical (think Private Witt vs. Sergeant Welsh in *The Thin Red Line* (1998)). A film might function to communicate the filmmaker's own or some other person or peoples' attitude toward life. And the purpose need not be to induce the same

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[94] It's worth noting that there is criticism of the treatment of Atticus Finch as a role model in the legal profession. See for example, Freedman (1992, 1992, 1994).
[95] See Dilthey (1911) and Carnap (1959).

behavior in viewers but simply to inform the audience of their existence. This sort of function seems possible with paintings and music too.

At broad glance it appears films can have many sorts of content. They seem plausible candidates for communication. But what other features typically associated with language do films have? Are films closer to language than Currie seems to think they are? In film, a degree of conventionality is possible similar to our discussion of paintings. Different films can carry the same general message. Changing the color of the clothes of the actors might matter to the overall message or it might not, or making the film in black and white, or in Japanese. In early films if you wanted to show a person arriving at someone's apartment, you would first show them walking to the lower entrance. Then opening the lower door. Then an interior cut to them walking into the building and closing the door and walking up the stairs and then opening the apartment door and another interior shot of the opening door, and so on. That's a lot! But later on, the way things like this were depicted in film started to change. Soon a person was just shown walking up the lower entrance, opening the lower door and then an interior shot to them walking into the apartment. Or they just did a dissolve from the entrance-level view of the building to the interior of the apartment. In this respect, I think Currie is wrong to worry about conventionality - in film, it is all over the place. Using close-ups and parallel action (going back and forth between two events happening in different places at the same time) are other examples of different options filmmakers have for storytelling. And filmmakers and movie-goers will have to negotiate these sorts of moves, there will be a back and forth, with audiences deciding whether the way a film is cut makes sense or not (Apple & Staenberg, 2004). For an example of this, consider American filmmaker Francis Ford Coppola's 1979 *Apocalypse Now*. In its original form, Coppola had the film end with a shot of Willard piloting his patrol boat away from Kurtz's

compound superimposed over the face of a stone idol and then fading to black with no credits. Later, in the 35mm general release version, Coppola changed the ending so that after the shot of Willard and the idol, audiences were shown the credits superimposed over shots of the jungle exploding into flames. After this new version of the ending was screened, Coppola started hearing that audiences were interpreting it as an air strike called in by Willard onto Kurtz's compound, and so Coppola changed the ending again and simply put the credits on a black screen.

Now for a moment go back to the example of how filmmakers toyed around with how to show a person walking up to an apartment. Think back to Grice's conventions. Films tend to go, at least nowadays, generally with the short and direct route of expression. They do the dissolve transition or the quick cut rather than the long walk. They in doing this tend to show merely what is *relevant*. If the hallway of the apartment building and the walk don't matter, they aren't included. Superfluous characters and other objects tend to be excluded or not focused on by the camera. This is similar to the theatric principle of Chekhov's gun. On one rendering of the principle every part of a story should contribute to the whole and anything that doesn't should be left out. This principle is due to Russian playwright and storyteller Anton Chekhov (1860-1904) who, about storytelling, once stated: "If in the first act you have hung a pistol on the wall, then in the following one it should be fired. Otherwise don't put it there." (Gurlyand, 1905, p. 521). This principle can sometimes be played with for effect, such as when something that later turns out to be a dead end is used to throw viewers off the track in a murder mystery.[96]

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[96] We might call this an "anti-Chekhov" device.

The hallway case is interesting because it seems to show how even in film there is room for relevance, but the case also brings something else up. Must the gun on the wall always matter? Relevance and Chekhov would seem to suggest that, assuming a sender is following those principles, that anytime we see a gun on a wall in a film we should suspect that it will somehow come back later. And yet, I'm not sure seeing a gun on a wall in a film should always raise our level of suspicion quite so high. It should depend on the film. It could be that the gun just adds to the décor of the setting the characters are in; its presence need not foretell anything sinister. Similarly, the lack of a gun on a wall need not tell us one won't show up later and to big effect seemingly out of nowhere.[97] When we get to Chapter 4, we'll see that there are similar issues for maps.

As I said earlier, Currie also worries about whether film might approach anything like syntax or some sort of combinatorial system. Unfortunately, he doesn't spell out what exactly he takes these things to involve. I think, however, that films seem to have at least some sort of structure. The *combination* of images matters. And the *ordering* of those images gives the combination a meaning or content beyond that of the images themselves – which may in turn have systematic mappings in the same way depicting pictures do (with shading corresponding to lighting and what not). The role combination and order play is even more obvious with cartoons and comic books. Consider the combination of the images (in this order) of a ship exploding and then a close-up of a cannon being fired. This combination might not make sense, whereas the opposite – the close up of the cannon firing and then the ship exploding - does. The content of the second combination seems to suggest the cannon ball is what caused the explosion of the

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[97] This is sometimes known as the "Deus Ex Machina" trope in film and literature, where a solution to some problem seemingly appears out of thin air.

ship, whereas with the first combination it's less clear exactly what might be being conveyed. Add to this that the images of the cannon being fired and the ship exploding do not standing alone seem to convey the same content as their combination or their ordered combination and that the parts have systematic mappings, and it seems that in film as in other cases of art and communication, we can get *encoded combinatorial* signals or *syntax*.

Of course, most films, even most so-called silent films, have some sound or music. This too can add to a film's overall message. One kind of music during a certain scene might make it very serious and ominous, whereas using something else might make the same scene, the same combination and order of images, seem silly or a sort of mockery. Silence can be used strategically too. Other elements aside from sound – style, color, pace, etc. - can be added (or subtracted). What we get is the possibility of films with incredibly complex combinatorial structures.

Not all things that people might consider films, though, are obviously going to be instances of communication. Take video from trail cameras for example. Or suppose I simply filmed a sunset for 10 minutes. The situation here seems to be similar to that of a typical photograph where what we have is really just a very peculiar kind of natural sign, an instance of just the left-hand side of the sender-receiver model. There is no back and forth.

Recall that in our discussions of the other forms of art, we saw that accuracy had a place in these forms. Is there a place for it in film too? I think so. Who among us isn't familiar with some Hollywood film about some historical event where the director has made up characters that never existed or events that never took place? Films can be more or less accurate, and they can be so in many ways – sound, events, characters, feel, etc. And they can also exhibit the

imprecision or lack of detail we talked about earlier too. The example involving the character walking up the stairs being shortened to them simply opening the door of the apartment exemplifies this.

3.7 Collective Art

When discussing films, for simplicity I considered the case of a single auteur. These cases are fairly rare. Usually films have hundreds of people involved and are less centrally controlled. Other forms of art are similar: dance, song, theater. What are we to say about these cases? Are these signals too? If they are signals, who is the author or sender?

In Chapter 2, I made the case for the possibility of group senders and receivers. The morals there apply here as well. As long as a piece – a song, a dance – is made non-dictatorially and by some non-mechanical procedure (not necessarily the straw-vote), the author or sender will be the group as a whole and the signal will be the combination of individual sender voices into one collective voice.

Is there anything like a group signal in the case of music? I do not know of any *clear and obvious* cases in this realm, though I suspect there are a good number of actual real-world examples. People are likely to want to point to orchestras and choruses as examples, but I think most of these cases better fit a sort of sovereign analysis. In most orchestras, the conductor calls pretty much all the shots. There is some room for creativity in the way individuals play their parts, but even then, the playing of every member is usually constrained by the preferences of the conductor to some degree. Conductors in effect use musicians as instruments themselves.

Here is a musical case that I take to be somewhat close. The English rock band the Beatles is one of the most famous musical groups of all time. Was the music produced by them a song by the Beatles as a group or are their songs more accurately described in some other way? For many of the songs it appears the group worked quite collaboratively – John came up with the rhythm guitar and some lyrics, Paul some lyrics and the bass part – and they negotiated the lyrics - George the lead guitar part, and Ringo the drumming. Moreover, they had common interest in the songs working out. Yet how well their song-writing process sometimes fit something like that described in Chapter 2 is hard to say. Some biographies point to John and Paul making the majority of the artistic contribution in many of the songs and deciding the majority of the band's musical direction. I think in the case of the Beatles it is safe to say that some cases came closer to the paradigm example of a group signal and others not. Sometimes Paul might write George's guitar part or Ringo's part or both and George or Ringo simply play their part in the song without any opinion or alteration. When things like that happen, we move closer to a sovereign case. Indeed, a number of Beatles songs were written by one member with the others essentially playing backup band. That's about as close to the sovereign case as a musical example can get, similar to the chorus and orchestra cases.

But another way we might look at the Beatles case is by focusing in on John and Paul. John and Paul's songwriting partnership is famous for their choice to always credit their songs to the both of them, to "Lennon-McCartney". They chose to do this in part because of the highly collaborative nature of their work. In this case, I suspect it might more often be OK to describe what is going on as group or joint signaling, that the songs were produced by Paul McCartney-John Lennon and not just Paul or John. But, again, how well their song-writing process fit something like that described in Chapter 2 is hard to say and it probably varied from song to

song with John being more artistically in control sometimes and Paul others. One take away lesson from the Beatles case is that in many instances, authorship will come in degrees. Sometimes one person in a band will have more say than the others. Sometimes two main people will write the song and have the rest of the bad simply play their scripted parts. It won't always be a full-blown case of paradigm group communication.[98]

Another thing the Beatles case reveals is the difference between joint *authorship* and joint *action*. Despite all the Beatles playing their instruments together and in a cooperative fashion to get a song out for audiences to hear, it can be the case that at the same time the song is primarily authored by John and Paul. Ringo and George are agreeing to act along with Paul and John, to join them in performing, but they are not contributing to the decision-making process involved in creating the song from an authorship point of view. This is not something I've seen talked explicitly about by theorists who work on joint action. And I think it is worth taking note of.

Another case of group communication in music might come in the form of *jamming*. Sometimes members of a musical group will simply start playing with no real coordination. It's fairly chaotic until members start reacting to what other members are doing – until the guitarist starts changing what he is playing and how in light of what the drummer is doing or vice versa. In this sort of case, a song can sort of just emerge with no foreplaning or direction. Here we might get a case of group communication that comes about without spoken agreement. And the case

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[98] The American rock group the Doors might be another close example. For the majority of the band's existence, songs were credited to the entire band, and biographies point to most songs being highly collaborative. Robby Krieger – the band's guitar player – is recorded as saying the following: "Most groups today aren't true groups. In a true group all the members create the arrangements amongst themselves. Here, we use everybody's ideas." (Weidman, 2011, p. 82).

might come in degrees. The drummer, for example, might tend to be less flexible and less reactive than the guitarist to what others in the group are doing. But then eventually the group settles on a way of playing, settles on a song. We get a case of group communication in music that is closer to Hume's rowboat case.

Let's turn now to the world of visual art – paintings, drawing, and the like? Are there examples of group communication here too? Consider what is known as Tunisian collaborative painting.

Figure 3.28. An example of a collaborative painting. Lawes, R., Love, G., Glover, B., Ferguson, B. (2018) *Voracious paradise* [Painting]. Collaborative Painting UK. https://www.collaborativepainting.uk/news/tag/tunisian+collaborative+painting

This way of making art was created in the 1980s by Tunisian artist Hechmi Ghachem and later popularized in America by American artist David Black (though, I've seen something like it done by others without awareness of the Tunisian technique).[99] These works involve three or more artists usually with a limit of about ten. The group starts a painting without anything

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[99] A nod to Mike and Max Tapia of Tempe, Arizona is appropriate here. These two brothers – friends of mine – introduced me to this idea in undergrad. They had no knowledge of the Tunisian school.

planned out – what it will be about, what it should look like. Artists can paint over what each other have done on the canvas and generally paint whatever they like. In some versions, there is a single chosen arbiter who says when the painting is finished. In other versions, when a painting is finished is decided by majority vote. At the end, everyone signs their name. Is this a case of group signaling in art? I think it is hard to tell. There are at least two issues. The first is that it isn't clear what the interests and incentives are here – is this mostly a cooperative enterprise, a free for all, why are participants doing this? And who are the intended receivers? What are they supposed to get from this? Second, it may not be a problem that there doesn't appear to be some joint message artists are aiming toward making when they start out, but it's not clear whether the procedure they use in making the painting really makes a coherent joint signal at the end out of the disparate markings participants put on the canvas. Suppose the artists make their marks in turns rather than all of them drawing at the same time. Then I'm inclined to see the possibility of the piece working as a signal and in what capacity it works as a signal as lying in the hands of the last person to mark on the canvas. In a sense, their position is like that of someone buying a painting from a store and drawing on it. They could mark on the piece in such a way that it produces a coherent signal, but they could also do something that disrupts any possibility of that.

But what about if everyone draws or paints on the canvas simultaneously? This case is harder for me to pin down, but I think this could be possible. It could be like the musicians jamming. Sometimes it starts rough but sometimes eventually something meaningful comes out of it through an unspoken back and forth. As I said, musicians jamming react to each other, change what they are playing and how they are playing in light of how others are playing. I've never seen this in painting, but I can vaguely imagine how it might be possible. Still, a project

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could be more overtly collaborative. A painting project could take on a decision structure very similar to that described in Chapter 2. Artists could vote on what the subject should be and vote on details – should it be a landscape painting? What if I put a big tree there? But, again, even here there could be room for latitude on the part of participants. I could choose without input, for example, what color the tree I paint might be. The lesson, again, is that how well a case fits the paradigm model will come in degrees. I'll call the differences between these two extreme cases the difference between *partnered* and *joint* artist works. But, again, as we saw with the Beatles case, some cases of joint art might not be so joint *authored*.

There are two more cases of collaborative visual art I'll look at briefly. Consider the 17th century paintings of Flemish artist Peter Paul Rubens (1577-1640) and Dutch artist John Brueghel the Elder (1568-1625).

Figure 3.29. Brueghel, J. & Rubens, P. P. (1617). *The Garden of Eden with the fall of man* [Painting]. Mauritshuis, Hague, Netherlands.
https://www.mauritshuis.nl/en/explore/the-collection/artworks/the-garden-of-eden-with-the-fall-of-man-253/

Ruben would paint the figures and Brueghel would paint the landscapes. Are these works cases of group communication? The answer to this one is difficult. First, early on Ruben and Brueghel sometimes edited each other's work, and although later on they seemed to come to some way of agreeing on how to do things before getting started on a painting, it's not clear they followed a process like that in Chapter 2 (de Voogt & Hommes, 2007). Second, most of the works they produced were under the auspices of the courts and the archdukes. So, it is likely that even if Ruben and Brueghel did follow something like the decision procedure in Chapter 2 between themselves that this sort of procedure wasn't in play between them and their bosses. In fact, now we have to take into consideration issues concerning commissioned works, which I'll address in just a moment.

The last visual art example comes from Italian and British artists Gilbert Prousch and George Passmore, better known simply as Gilbert & George.
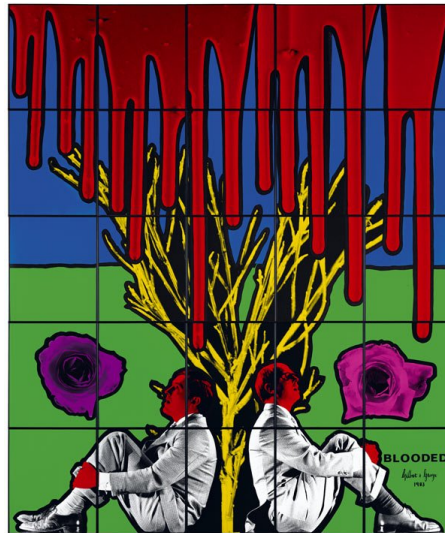

Figure 3.30. Prousch, G. & Passmore, G. (1983). *Blooded* [Photo collage]. Musée de Grenoble, Grenoble, France. https://www.tate.org.uk/whats-on/tate-modern/exhibition/gilbert-george/gilbert-george-major-exhibition-room-guide/gilbert-9

They describe their work explicitly as being of one author: "Two people make one artist. We think that we are an artist" (Galenson & Pope, 2017, para. 1). But how collaborative are they? In a Q&A on *The Guardian's* website, Gilbert & George give the following somewhat tongue in cheek answer to the question of how they worked as a partnership, whether one of them was the idea man or whether they share the creative process equally:

> We call this the great heterosexual question. We are equal in our partnership
> where most mixed couples are not. We don't cook, clean, shop or wash up. This
> makes a lot of ladies jealous. See you soon G&G. (2014, 5:12, re. 1/2)

Being serious for a moment, assuming that their artistic partnership really is one of total equality. Then if they follow a procedure roughly like that in Chapter 2, they may be an example of group communication in visual art. Unfortunately, there aren't many details on this specific aspect of their artistic process. Add to that that it isn't obvious what the reaction on the side of receivers is supposed to be, and it becomes hard to tell if what is really going on is communication.

When discussing statues earlier, I talked about statues that depicted someone and that might function in an honoring sort of way. In many cases, these public statues are commissioned by a local or federal body – they are not just created by some sole artist or group of artists who put them out there themselves. What are we to make of authorship in these cases? Here is what I think is one plausible account. In these cases, what a governing body in effect does is *choose* a signal to put in place. They look at various statues (or designs of statues) that might be created and erected and they have an artist or group artist produce that signal for them. Imagine a sender who can choose from a variety of colored balls in a bucket and hand a ball to a receiver as a signal. That's the sort of case I see this as being similar to, however, here the sender, if they

tightly control design, is the governing body and the audience is the public. In this sense, the piece is closer to a group signal than a standard individual-individual signal. There could be a back and forth. If the hope is that the statue will inspire people to act a certain way, then if it does, the governing body may tend to go with commissioning similar statues in the future; if not, then the body might choose a different approach the next time around or tell the artist to alter the current product. The Ruben and Brueghel paintings combine the feature of a commissioner with two artists working collaboratively, resulting in an even more complicated case of group communication. Again, here as with in other cases, there might be flexibility and things will come in degrees. In some cases, artists might have more flexibility, in other cases less.

But this also highlights an important lesson. Consider again the Confederate monuments. If these serve the purpose of honoring Confederates or as I suggested earlier influencing behavior, then if they are also as I suggested group signals, the result is that these are examples of the United States or the relevant local bodies – the states, counties, or cities - sending signals that arguably have racist communicative purposes – which arguably is problematic on a civil rights level. This might be easier to see with a related but different explanation of what is going on in some of these cases. University of Virginia professor Jalane Schmidt describes Confederate statues in public places as having "raced public spaces as white" (Holloway, 2018, para. 13). Writing primarily about Confederate statues put up by the United Daughters of the Confederacy near courthouses, Professor of history at the University of North Carolina at Charlotte Karen Cox says of such public monuments: "The UDC put [its monuments] in places where citizens have to work with their government. If you're an African-American person or a person of color, you have to pass by that Confederate monument on your way into the courthouse. It was a reminder that you're not likely to get a fair trial or fair treatment inside of

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that building. That, to me, was one of the UDC's most overt signs to the local black community that, "We're in charge here. This is a white man's government."" (para. 15). As I said earlier, I take it one fair interpretation of the role these monuments might be playing is that of a sort of *territory marker*, and these appear to be, as I said, group signals – signals sent by, in some cases, the US government, but more commonly some relevant local body. With this analysis in hand, we can see why such statues are doubly problematic in a society that aims for inclusivity and says so in their laws and in public declarations – that society is contradicting itself and sending mixed signals.

Many war memorials might also fit a group sender interpretation. For Americans the most prominent memorials are probably the Vietnam Wall and the WWII memorial in D.C. These appear to function to honor, but these are different from earlier statues and monuments we've discussed in that they don't involve the use of similarity. The WWII memorial in DC does not look like any person or like the war itself. Same with the Vietnam Wall. So how do we make sense of these? I think this is a case where conventionality comes in to play in a more obvious way. Just about anything could have worked as a monument for these events. It's not so much the look of the monument, although tactfulness and other things play a role in reigning in design options. What matters more is just that there is something in physical existence that serves as a sort of public reminder or memory device. I discussed this option earlier but didn't talk about it with respect to non-depicting monuments. Cases such as these are similar on one level, I think, to putting a postcard on my shelf to remind me of my grandmother. Yet monuments like the ones we're talking about are often made of heavy lasting materials, not just a piece of paper. I think the situation is similar to how sometimes people don't just have post cards but get tattoos of loved ones and important events. We want people - in the case of a

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tattoo, ourselves - to remember what happened, we want to be reminded and more often and for longer. More permanent memory devices – stone and concrete monuments – do the same thing but for a larger audience – even future generations (similar to future selves in the case of the tattoo). These public monuments are memory devices on the local, national, sometimes even global scale. And, again, as with the case of other public statues, the sender here will likely be some governing body choosing from possible designs. I think this is a fair interpretation of the US Vietnam Wall and WWII memorials. Of course, we've also already noted worries about the status of the US and other countries as a group sender, and those worries would apply here too.

For sake of space I am going to skip talking about dance and look at films as our last case. This is not to say I don't think there are cases of dance that would fit the model of group communication – in fact, I think there are (improvisational dance for example) – or that I don't find dance interesting – because I do. Just that I don't want to spend time looking over every possible case of group communication.

I'll finish this section by looking at films. These seem like good plausible candidates for group communication too. The number of people it takes to make a modern Hollywood film is incredible, and so many people seem to contribute interesting subtle parts – the actors, the editors, directors. Unfortunately, I do not know of any major films that take on a process very close to that described in Chapter 2. In some cases, we have auteur films where almost if not every little detail is under the direction of the auteur – the script is written by them, the acting directed by them if not done by them, the editing done by them, the costumes made to their specifications. Terrence Malick's films and many so-called amateur films seem to be close to this sort of set up. These cases are closer, I think, to the sovereign paradigm than to the group

communication paradigm – not totally Hobbesian, but closer than most other Hollywood films will be.

In a paradigm auteur case, one person plays all the roles – writer, producer, director, actor, editor - but in most Hollywood films, these roles come apart. Usually the director is a different person than the producer or editor or any of the actors. And usually in these cases power isn't divided evenly – the director might be able to deviate from the scrip a bit; the editor might have final say in the editing room. What takes us closer to group signaling is the equal sharing of decision-making power in the creative process. What takes us farther away in these cases is the consolidation of it in fewer hands.

Of course, it is more complicated than that. Some cases might even carry a mix of group communication and sovereign communication. If there are two co-writers for a film who stick to some process like that in Chapter 2 and they pretty much get to call the shots much like a single auteur, then you could have something like a group sender at the top and everyone else following them more sovereign style. But, again, this sort of thing will have variations and degrees too. The Ruben and Brueghel case reminds us of this – we could have two auteurs mostly in control but who are also to some extent influenced by the preferences of some producer, or the write, and so on. All this is to say that films will sometimes be instances of group communication, but these instances will be somewhere on – usually near the middle of - a spectrum.

3.8 Art and Evolution

Lately, discussions of art, like communication, have tended to consider the evolutionary side of things. The focus has been on how art might have come about as some form of adaptation via natural selection. Philosophers and biologists have been split on this topic. Some have argued that art is not a fitness enhancing adaptation and others have argued that it is. Some writers have even tried to focus the discussion more narrowly, suggesting that perhaps the scope of these projects should be limited to specific arts. So, for example, the thought might go that the drive to produce music evolved separately from the drive to produce paintings or statues. The idea being that each of these arts might have its own distinctive contribution to evolutionary fitness. Others, however, have strived to develop more general theories of art's emergence or place in the evolutionary story. Some like American scholar Ellen Dissanayake have argued that the key to art's place in evolution is its role in "making things special" (Dissanayake, 1988). Others like Canadian-American psychologist Steven Pinker have tried to explain art away as a *spandrel*. In evolutionary biology, a spandrel is a trait that is a by-product of some other trait selected for by natural selection but not selected for itself. The spandrel trait stays around not because it is advantageous but simply because it isn't disadvantageous. Think about fur being advantageous in a cold environment. It could be that a species evolves fur and that fur just happens to be grey. If the grey coloring isn't disadvantageous and it isn't advantageous either, then the grey color of the fur is a spandrel. When talking about art as a spandrel, Pinker explains art this way:

> … art is a by-product of three other adaptations: the hunger for status, the
> aesthetic pleasure of experiencing adaptive objects and environments, and the
> ability to design artifacts to achieve desired ends. On this view art is a pleasure

technology, like drugs, erotica, or fine cuisine – a way to create purified and

concentrated pleasurable stimuli and deliver them to our senses. (Pinker, 2002, p.

405)

Sometimes the view has been summed up by Pinker by saying, for example, that "music is

auditory cheesecake" (Pinker, 1997, p. 534). Already, this view seems off the mark, however,

when we think back to the works of Bosch and Dix. These pieces, for example, don't seem to be

connected to aesthetic *pleasure* in the form of *adaptive objects* and *environments*. They hardly

seem to be cases of paintings serving as cheesecake but instead something like rotten and moldy

cheesecake. I can see, however, how some people might derive pleasure form these works. We

all know there are people out there who enjoy the macabre and other things usually deemed

unpleasant. But then this pleasure still doesn't seem to be derived from the works depicting

adaptive objects or environments. Hell or a WWI battlefield, for example, don't seem to be

adaptive environments.

Pinker later updated his view. Now art is supposedly the by-product of two traits: (1)

motivational systems that give us pleasure when we experience stimuli that correlate with our

evolutionary interests, and (2) the technological know-how to create purified and concentrated

doses of these stimuli. Again, however, it's hard to see how the Bosch and Dix cases fit in here.

That's enough for background. In this last part of Chapter 3, I'll be taking a look at two

general theories of art. I won't be focusing in on any of the theories that advocate an

independent evolutionary story for some particular art form. I've chosen to focus on these two

theories for one reason. They both see art as a form of communication and see its

communicative function as key to why it has evolved. Later on, in this section, I'll also briefly

take a look at the question of whether art might be found at the non-human level, whether it might make sense in any regard to consider animals too as producing and consuming art.

3.8.1 Art as Fitness Signal

The first view is that art is really something more akin to the peacock's tail. The idea is that art is primarily a tool for mate attraction and sexual selection. Art broadcasts a sender's fitness to mates, and this is the reason art came about – or at least, why it has stuck around. American evolutionary psychologist Geoffrey Miller (2000, 2001) holds a view like this. Consider rock stars, the thought goes, why else do they do what they do if not for fame and women?

Different bits of evidence have been put forward in support of the view. One is that, according to Miller, the vast majority of artwork is created by men. This is certainly an empirical question, but I tend to doubt Miller on this mark. Throughout much of history plenty of art-making has been primarily the province of women – think of beadwork, jewelry making, basket making, and blanket weaving. Depending on what one counts as art, Miller might very plausibly be wrong here. And with respect to more men making art in modern times (if this is even true), it seems plausible this could simply be an artifact of our modern social structure rather than some ancient evolutionary origin. Men were simply the ones *allowed* and *encouraged* by modern society to make art in recent times – note that for quite some time women were not even allowed into art schools. Perhaps more women would have created art if simply given the same opportunities. It's worth noting that Miller also tends to focus on modern music for his examples, on rock music and jazz. But there are plenty of female artist today. Plenty of Madonnas, Lady Gagas, and Beyoncés.

Another bit put forward is that men are active in competition for females because females are choosy (due to the high investment involved on their side in child production and rearing), and men who are promiscuous are able to make more babies than promiscuous women (this is because on the female side, a baby take 9 months to produce whereas a male can produce many more children by different women in that same time). One problem with this view is that the data doesn't seem to support it. New Zealand philosopher Stephen Davies points out in his recent book *The Artful Species* (2012) that a study of 207 European male composers from the fourteenth through twentieth centuries shows these composers produced significantly *fewer* children than the general European population. (p. 126). One could instead insist that the fitness advantage from art is to be found not in the form of production of more children but in the form of artistic talent bringing in higher quality mates and that talent and attractiveness being reliably passed down to the few offspring produced. But this too isn't supported by the data. As Davies puts it, "artistic talent of the highest order is only modestly inheritable" (p. 124). Think of how few famous artists have children that have followed as successfully in their footsteps.

American anthropologist Kathryn Coe points out that the view doesn't seem to cover some of the cave art of the Upper Paleolithic, which appears, because of its placement in high up and obscure parts of caves, to have been made with no intention of subsequent viewing (Davies, 2012, p. 125). I think this is a good plausible counter example to Miller's view, but there does also seem to be an explanation that would instead support it. One suggestion for the placement I haven't seen in the literature is that perhaps this was something akin to graffiti done in difficult to reach places. The importance is in the *placement* due to the *difficulty* involved in making the piece – compare putting graffiti on the side of a house to putting it on a town's water tower. The difficult placement is what (or part of what) makes it impressive and attractive to mates. But for

this to be true, the piece would have to have been made with some intention of subsequent viewing by others otherwise no-one could verify the accomplishment. If this interpretation were correct, the art could fit the Miller model. But more work would need to be done to see what the truth is here, why the art was really put in these places.

But there are other things going against the fitness view. It also doesn't cover private art, art made for one's own eyes or ears only. Some argue that art must be public in some sense, intended to be viewed by someone other than the creator, for it to count as true art at all. I doubt this view of art. I myself have written songs on guitar that I intend never to share with anyone else. And consider the case of fictional artist Declan Howell in the episode "Look, She Made a Hat" from the American television series *The Marvelous Mrs. Maisel* (Sherman-Palladino & Babbit, 2018). Howell is known as a master artist and a recluse. He never sells his paintings or puts them in museums. And he has one piece in particular that he never shows to *anyone*, just keeps it in a secret room (though, he does later show it to the main character of the show after deciding that she is worthy). Would such a piece count as art – especially before Ms. Maisel's viewing of it? If the view of private art counting as art is wrong, then we don't seem to have another case against Miller's view. But I tend to go with accepting private art as art too.

The missing cat case and expedition art also seem to provide examples of how possibly something that at least looks like art – I'm willing to call it art - could come about for purposes other than mate attraction. And then consider that children and adults often make art for loved ones like siblings and grandparents. Davies points out mothers singing to their babies. This art doesn't seem to have anything to do with mate attraction, seems to run counter to Miller's view.

The view that art might *sometimes* play a role in sexual selection is not unrealistic, though. A work of art can act as a sort of natural sign of cognitive ability, dexterity, leisure time, attention to detail, personality, interests, resources. The list goes on. This allows it to have a role in mate attraction since these attributes might be important to potential mates. But this is like passive style - a *passive* mate attraction. The art is being used as a natural sign, index, or cue. Senders could later, of course, notice this and so produce art or art of a certain sort for its mate attracting qualities. Then we have *active* mate attraction via art. This sort of use would fit the sender-receiver model, would count as a signal. But to say that most art generally functions as active mate attraction or that it came about primarily due to its functioning this way, seems overly hopefully. Moreover, information about things like cognitive ability, dexterity, personality, and so on are easily gathered in a passive (or active) way from other behaviors and products – things like athletic feats, technical accomplishments, and business, political, or social success and wealth.

3.8.2 Art and Group Fitness

In a recent paper, Noël Carroll (2014) argues that perhaps art has a role in *group* level fitness. Populations of humans who engaged in artistic behavior, suggests Carroll, tended to outperform groups that didn't.

Stephen Davies, is an example of someone who disagrees with this idea, seeing a group level explanation instead as a rather weak one. Davies (2012) writes:

> Many claim that aesthetic or art practices are evolutionarily significant because
> they benefit the group. That is, these theories adopt a commitment to multilevel

selection theory and depart from the classical Darwinian model of evolutionary

explanation that focuses on individuals or their genes. This . . . account is thereby

weakened in explanatory power. This is because genetic inheritance provides a

strong explanation of the faithful replication of beneficial traits over the long

term, assuming the environment is stable; whereas the preservation of group

benefits relies on cultural transmission, which is less accurate and reliable. (pp.

43-44)

As Godfrey-Smith (2013a) points out, however, there are many kinds of multilevel evolutionary

models. Some even involve a mixture of genetic and cultural transmission (Bowles & Gintis

2011). Godfrey-Smith (2013a) states further, and I follow him on this, "even if group-level

transmission processes are less "accurate" than genetic inheritance between individuals, this does

not show that those group-level processes are thereby "weakened in explanatory power" -- or, at

least, that they must be weak causal factors. The cultural inheritance of languages and norms can

be enormously important."

Another problem with Davies' view of art and group selection is that his discussion of

group selection and art focuses on versions that involve altruism – often defined as someone

helping others at their own expense or with no benefit to themselves. Godfrey-Smith rightly

points out that there are other options here. *Mutualism* is one of those. Godfrey-Smith goes on

to defend the possibility of group level selection of artistic behavior by focusing on the free-rider

version of the mutualism problem, but there is another way to look at it. Mutualism is

sometimes defined simply as behaviors that benefit both others *and* one's self (West et al., 2007).

I think this way of looking at the group level selection of art is the most helpful.

Consider art that tells a story – dances, songs, paintings, films. As we've seen, these forms of art can serve to communicate historical or moral lessons, to communicate certain values and enculture current and future generations. Again, Carroll (2005, 2014) thinks art perhaps does this better than any other tool. Mexican painter Diego Rivera (1886-1957) once suggested this too, pointing out that art can be understood by the illiterate in a community and across cultures (1932, p. 53). If this is right, it seems possible that when artistic works are made available or disseminated to the wider community - as many are – they might work partly to help bring about a sort of informational and behavioral *cohesion* within the group, arguably something that would help the group better cooperate and coordinate on a larger scale, something that seems helpful for maintaining the group's continuation and success as a whole, something that would benefit both receivers *and* senders. Consider the famous Smokey Bear posters in the US reading "Only You Can Prevent Forest Fires". Even something like this can play this sort of societal cohesion inducing role. If the members of the group adhere to the lesson of the poster, if they all do a better job of tending to make sure that their campfires are out, then the group has a better chance of protecting its forests, its *resources*, and so a better chance of survival. In this case, *everyone* in the group wins. Examples of art that function this way and *don't* involve written language would be things like the monument art discussed earlier.

This brings up a good point. Some unifying art can also be *divisive* in a sense. Art that glorifies the South and its old values or propagates false "Lost Cause" narratives, for example, seems to lead to separation within the *wider* community of the United States despite unifying a certain subgroup, namely white Southerners. Children raised in the South and exposed to art glorifying the South – the Confederate flag, monuments to Confederate generals, songs celebrating the "Old South" - will be raised in an environment promoting and normalizing

different values and beliefs than children raised in the North. The result of this is not the promotion of coordination and cooperation between peoples of the North and South, better social cohesion in the US as a *whole*, but instead an us vs them mentality and the disintegration of group togetherness on the broader scope. This is because both groups are being enculturated with different beliefs and values despite at the national level being a part of the same country. Mutualism of a sort can have a home here too. Perhaps the white Southern senders and receivers, for example, gain benefit from the Confederate art in that it helps them maintain their social and political power in their corner of the US, despite on a broader scale it actually destabilizing the wider group, the national group, and so, also having a negative effect on the sender and other white Southerners – a short-term mutual benefit to the subgroup and the sender with a long-term mutual detriment to the whole (subgroup and sender included).[100]

Plato in Book 3 of his classic work *The Republic* (375 BCE.) worried that some works of art might have a *negative* impact on society. Rivera (1932), who pointed out the good that art could do for the working-class, also saw the pain it could cause when used for ulterior motives. In the case we just saw, art was detrimental to the larger group due to the competing values and beliefs being communicated. But there's another way art can be divisive at the group level – by dividing members individually. Certain values seem to be group fitness enhancing (perhaps in conjunction with certain others) and others not, and art is a conduit for spreading these good *or* bad values. If due to some piece of art introduced into a community everyone started abiding by

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[100] It's worth noting that even Confederate general Robert E. Lee argued against the construction of Confederate monuments and for apparently similar reasons. See Lee (1866). There is also evidence Lee may have been against the construction of *any* monuments to the war. See Lee (1869).

a norm of lying, cheating, or stealing, I wager this would likely not be good for the survival of the community.

What we've just seen is that public art doesn't just provide a group level advantage *no matter what*. It is possible for art to be detrimental. With this in mind, I think it's worth it for communities to consider what values their *public* art is promoting, for it may be promoting values that engender division more than comity. And yet, I think cases of detriment to the society as a whole, in a sense stronger than the Confederate statues are, will be rare. It's hard for me to imagine a case where works so divisive would get off the ground and be *maintained* - at least, long term. It's hard to maintain a signaling system when the senders and receivers stop working together, which is what these sorts of works presumably would lead to. I can imagine one-off examples of these sorts of signals. But it's hard to see how mutualism would apply here.

There's another way I can see communicative art playing a role at the group level. Consider style. In battle and in contested territories, dress, costume, or makeup that helps mark one's affiliation can be a lifesaver. Those tribes that learned to mark identity would likely have fewer cases of accidental killings of their members during battle and at the border and have an easier time gaining help from other members during battle (since those who see them in trouble will be able to more readily recognize them as one of their own – especially in larger groups) and in other situations out in the field (say, I see a man being attacked by an animal – even if I don't know him, I can now know whether he is an enemy or a member of my group). A closely related use to marking affiliation is marking *territory* – which we talked a bit about earlier. Groups that mark their territory can plausibly prevent more accidental incursions and so expend less energy

defending their own – and plausibly also give receivers the ability to prevent their own unneeded waste of energy and risk of harm. Sort of a stationary snake rattle, though with more too it.

For a final example of communicative art playing a role at the group level, think back to Carroll's suggestion that monuments might play a role in bereavement. A community that produces art that in effect helps members of the group heal and commits its self to making good on their sacrifice might do better than groups that don't do this. These groups might be better able to heal and move on from tragedies more quickly and maintain their social bonds and keep to their promise of making good on that sacrifice. Groups that don't do this, on the other hand, plausibly might have a harder time healing, which might increase the odds of unrest and the disintegration of group cohesion.

All the views presented leave room for the possibility of a combination of functions in the signals involved. Thinking about the mate attraction hypothesis, a piece of art might, for example, benefit the public or some subgroup in one of the ways listed above *and* increase the artist's reproductive fitness. This would be a form of mutualism – different from just benefitting indirectly or even directly perhaps in the form of cash. And this can take shape in a number of forms. If the piece of art successfully helps the community, perhaps it draws attention to the artist, including the attention of potential mates. Perhaps the piece is primarily intended to attract mates (and does) but also inadvertently helps the wider community. Or perhaps the piece just accomplishing both tasks independently. There are a number of ways things might go here. Other roles could get mixed in too. A public artwork that works as a territory marker might benefit me, my group, and, in some way, my potential enemies. A statue might help a community grieve but might also promote problematic values.

3.8.3 Non-human Art

Some authors have seen art as something created only by humans. Often writers take this line because they take the production of art to involve intentions. Griceans will often say this when I discuss art with them. Boardman (2016) develops a view in this vein: x is a work of art if and only if: (a) x is presented to a public audience for the purpose of their appreciation or contemplation of x and (b) a proper understanding of x requires recognition of (a)" (2016, Abstract). But as we've seen, communication can arise even in agents without intentions or at least agents without complicated mental states like those found in us.[101]

If art is sometimes communicative, is it sometimes produced at the non-human level? Prum thinks some animals make art. Recall that on his view, art is to be evaluated and that for him what is being evaluated in the animal cases is sexual fitness. Is this sort of art communication? As we saw just a moment ago, this seems to be what is being evaluated in certain human cases, the active mate attraction cases, and we still considered this communication. If this is right, it seems hard to draw a line and say animals are not making communicative art too. We'd have to rule out art made by humans primarily for active mate attraction purposes, and that seems like something we shouldn't do.

Two examples of art of this sort seen in animals are the structures built by Bower birds (*Ptilonorhynchidae*), in particular the Satin Bowerbird (*Ptilonorhynchus violaceus*) of East

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[101] Boardman's view seems to have other potential problems. First, it seems to rule out private art. It also seems a couple could decide to have a child for the purposes stated by Boardman, to show them to the public for appreciation, etc. Another example involves producing a beautiful knife both for public appreciation of its beauty but also to be used by its new owner. Must an object be made only with the purpose of public admiration, or is it OK for the object to have an additional purpose?

Australia (Figure 3.31) and the Vogelkop superb bird-of-paradise (*Lophorina niedda*) of Western

Papua (Figure 3.32), and the nests created by male pufferfish in the oceans around Japan (Figure

3.33).

Figure 3.31. Boone, J. (2016). Satin bowerbird at its bower [Photograph]. Wikipedia

Commons.

https://upload.wikimedia.org/wikipedia/commons/3/31/Satin_Bowerbird_at_his_bower_J

CB.jpg

Figure 3.32. Arnd, I. (2014, April). The bower of the Vogelkop gardener bowerbird.

[Photograph]. *The Guardian*.

https://www.theguardian.com/artanddesign/gallery/2014/apr/22/the-worlds-best-animal-
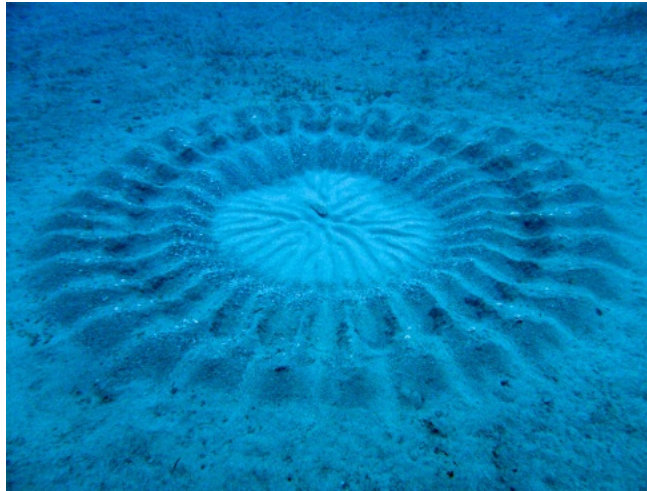
architecture-in-pictures

Figure 3.33. Ito, K. (2012). Male pufferfish nest [Photograph]. In (Bates, 2013) "What's this mysterious circle on the seafloor?" National Geographic Blog. https://blog.nationalgeographic.org/2013/08/15/whats-this-mysterious-circle-on-the-seafloor/

An interesting difference between the animal cases and human cases seems to be that the Bower birds and puffer fish all make roughly the same art as their con-specifics – they all make nests of roughly the same look and material. Humans, on the other hand, engage in many different forms of art, though I could see how one might argue that the range for humans is also somewhat more limited than it first appears. For example, cubist, expressionist, realist, and surrealist paintings are all *paintings*, usually on canvas with oil or acrylic – just as the various Bower bird nests are all *nests* and usually made of wood and grass.

Some animal architecture, despite being very elaborate, won't count as art, however. A spider web or a beehive won't count, for example, despite their intricacy if the purpose of the work is simply practical, which they appear to be (to catch insects in the case of spiders and to protect the colony and raise offspring in the case of bees). What matters is that the work is also created to be *evaluated* by a receiver or created with some sort of *communicative* function.

Otherwise, we just don't have art, no matter how beautiful to our eyes. This will even be the case for the "log home" of the bagworm moth, which appears to serve primarily a protective role (Figure 3.34).

Figure 3.34. Biswas, R. (2015). Bag worm log cabin [Photograph]. Wikipedia commons. https://commons.wikimedia.org/wiki/File:Case_built_by_Bagworm_moth.JPG

Aside from creating structures, there are other things animals do that seem to fit the art version of the sender-receiver model. First, there are dances. Consider the dances of the Vogelkop, the same bird that makes the elaborate structures in Figure 3.32 (Figure 3.36) and the Red-capped Manakin (Ceratopipra mentalis) of South America (Figure 3.35). The Red-capped Manakin's dance is often being described as a sort of "moonwalk", whereas the dance of the Vogelkop is more of a jumping from side to side. The purpose of these dances is to court females. The dances seem to be intended to be evaluated, not just signals that say "Mate with me". I would count these dances as art, despite their main motivation being a sexual one.

Figure 3.35. Laman, T. (2018), A male red-capped manakin performs his signature 'moonwalk' dance to a female [Photograph]. National Geographic Image Collection. https://www.nationalgeographic.com/news/2018/02/animals-birds-courtship-mating/#/01-bird-mating-rituals-NationalGeographic_1490006.jpg

Figure 3.36. Laman, T. (2018), A Vogelkop superb bird of paradise performs a mating dance [Photograph]. In, Gibbens, S. (2018). "New Bird of Paradise species has smooth dance moves". *National Geographic.* https://www.nationalgeographic.com/news/2018/04/new-species-birds-of-paradise-animals-spd/

Songs might fit the art version of the sender-receiver view too. Consider that many bird species have elaborate songs or large song repertoires. The Common Nightingale (*Luscinia megarhynchos*) is a good example. The only nightingales that sings are males without partners. Researchers at Freie Universitat Berlin discovered that the better a nightingale was at singing, the more complex the song and more ordered it was, the more support senders were likely to offer their mates and offspring in the form of feeding and defending them from predators and the better physical condition the senders were in (Bartsch et al., 2015). Here we seem to have a case of a mating call that doesn't just say "Mate with me" but instead is meant to be evaluated by receivers. In that case, we get an instance of a song produced by an animal that fits the art version of the sender-receiver model.[102]

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[102] It's noteworthy that the researchers claim in their article that the female receiver birds were not interested in the beauty of the song, but instead in the song's complexity and what information it carried about the quality of the sender. They don't give an explanation, however, for how they determined that beauty wasn't involved. I can see, though, how even in a human case what receivers care about is not how beautiful a work is but how detailed,

What about *displays* such as the peacock's tail? Are these cases of art in the animal world? These are interesting because displays tend to be evolved traits rather than learned behaviors – though, some animal dances, songs, and structure building might be primarily evolved behaviors too. I think it's hard to say. Suppose our instinct to dance or paint or sing evolved. Would we not call it art anymore? I think probably we still would. But suppose beards in men are for mate attraction as Darwin and others have suggested, much like the peacock's tail (Darwin, 1871).[103] Would we feel comfortable calling a beard art? Probably not. Evolved displays or physical attributes meant to be evaluated for quality, though they may be beautiful, do not seem to count as art – at least, by the common use of the term. What seems to matter is the *creation* of the piece either in some performative way or some other constructive way. Of course, these things could *become* constructed to some extent – beard transplants are a thing now, and some men specially groom or even braid their beards - then we have something more like art, something created or altered with the intention of being evaluated. There are many animals that "decorate" themselves or alter their appearance in some way. But most of this is primarily for camouflage or protection and doesn't seem to involve any sort of communicative or evaluative aspect to it – the Sponge decorator crabs (*Hyastenus elatus*) seem to be an example of this. Consider also that displays can be more permanent or less permanent. A peacock's tail is always colored, but it can choose to display its tail or not. Octopuses, cuttlefish, squid, and chameleons engage in display behaviors by changing the color of their skin. This involves even more flexibility. And then consider Bearded vultures (*Gypaetus barbatus*). These vultures will rub their plumage in orange or reddish dirt or water in order to color their feathers (Jaubert &

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complex, or difficult to make it was. Is something like that still art? I think so, what matters is that it was meant to be evaluated. And as we've seen, beauty need not be the key aspect of all art. The missing cat drawing or the expedition art is primarily supposed to be informative, not evaluated.

[103] See pp. 192-267 of Darwin (1871) in particular.

Barthelemy-Lappomeraye, 1859; Berthold, 1967; Brown & Bruton, 1991; Houston et al., 1993; Frey & Roth-Callies, 1994; Margalida & Pelayo, 1999). Some research has suggested that this is for dominance signaling and mate attraction purposes (Negro et al., 1999). Though, other research has suggested it has a prophylactic function (Arlettaz, et al., 2002). Another option is that it serves both purposes. But supposing the first case is true, then it seems we might have a good example of decoration meant to be *evaluated*. This would bring us close to a case of communicative art, but it is a very primitive version of it – the decoration is not at all complicated or intricate. Another case talked about recently is that of a female chimpanzee named Julie who began repeatedly stuffing a stiff blade of grass into her ear. (Van Leeuwen et al., 2014). After Julie started doing it, other chimps in the group started doing it as well, started copying her. What role the blade of grass plays is not clear. If it is a form of self-expression or a way to attract mates, then we get something like communicative decoration, but unfortunately, it's just not clear what is going on here.

A final case I'll look at is that of Elephants making paintings. There have been a few cases of this. Elephants have even painted paintings that depict an elephant (Figure 3.37).
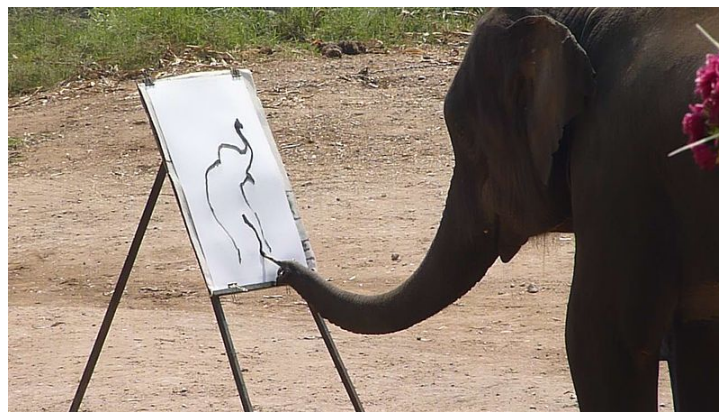

Figure 3.37. Avi, D. (2012). A trained elephant in Chiang Mai, Thailand. [Photograph]. Wikipedia Commons.

Is this art in a communicative sense? I think this case is difficult. The paintings do seem to depict an elephant. And the elephants are the ones painting the canvas. However, there doesn't seem to be a back and forth in the relevant sense. The elephant isn't making the painting for an elephant audience, it is for a human audience. This isn't necessarily a mark against it being communication on its own, but notice that the elephant is making these paintings this way for reasons other than its own attempt to communicate something. The elephants are taught to do this through reinforcement or punishment and draw the same painting, line for line, each time (English et al., 2014). There *is* a back and forth here. When the elephant doesn't paint the way the trainer wants, it is punished or not positively reinforced and when it does paint the way the trainer wants, it is positively reinforced, but the back and forth is not a communicative back and forth. The trainer does not get a *message* from the painting. Perhaps the audience does, but then in that case, I'm inclined to say that the message really is crafted by the trainer who is using the elephant as a *tool*. There is no room for creativity on the side of the elephant – the trainer calls all the shots. So, this, too me, does not seem to fit the art version of the sender-receiver model as a case of *non-human* communication. Perhaps it's an odd form of human communication where an animal is used as a tool. But it is not animal art in the sense we've been interested in in this chapter.

Summary

Art has been described by some philosophers as a form of communication, but what exactly it was thought to communicate varied from thinker to thinker. Others thought perhaps art could be

its own form of language, that it was communication but in a stronger sense, perhaps even having features common with natural language, things like conventionality and syntax. This latter view was fairly rare and often argued against. As we've seen, it turns out that art can indeed function as a form of communication. And there are many things that art might communicate. Moreover, communication in art is present in many different art forms – from paintings and drawings, to music, to dance, and to monuments. Probably there are even more. We've also seen that despite the doubts of prominent thinkers, art can indeed function in a way similar to language. It can be conventional and it can have a sort of structure or syntax. Finally, we took a look at the evolutionary side of the debate, why artistic behavior might be maintained, have come about, and whether it is ever engaged in by animals. Sexual selection may be a good explanation for art sometimes, but it doesn't seem to be a good explanation for art's origin and maintenance, and it certainly won't explain all instances of it. We also saw that there is a place for art in group level theories of selection. Communities that use certain forms of art plausibly stand a better chance at success than those that don't, and there are a few ways it seems possible this might happen. Finally, we took a look at whether non-human animals can be said to engage in art. It seems that indeed they can and they do in a number of ways. Not all the examples out there that people might point to in the animal kingdom turn out to be examples of art in the end, but a good many do.

Chapter 4. Maps, Blueprints, and Other Communicative Devices

4.1 Lines on Paper

Suppose you're trying to get somewhere but you don't know which way to go. One way to get there is to ask for directions: "Howdy, do you know how to get to Escudilla Mountain?" You might get a verbal response: "Yes, sir, just take US 191 south to Nutrioso, then go east on Forest Road 56". Another way someone might help you, though, is by drawing some lines on paper, that is, by drawing you a *map*. In the first case, your partner is communicating with you. In the case of a map, is something still being communicated?

Maps have a fairly long history, though apparently not as long as art. Maps appear to go back at least 18,000 years. That's how old the oldest known map candidate is. That map, found on the walls of the Lascaux caves in France, is composed of dots and depictions of animals, which some researchers have argued represent stars and constellations rather than some part of the earth (Rappenglück, 1997).
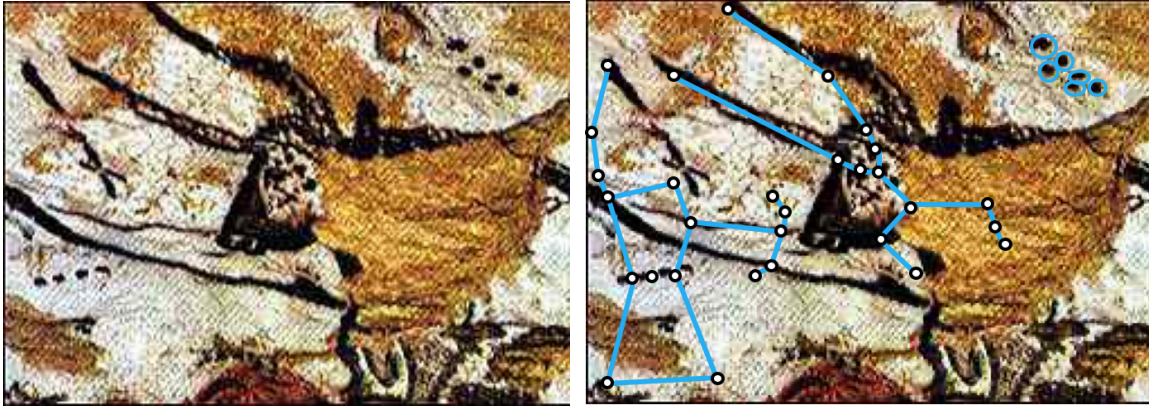
Figure 4.1. Left: a painting of what appears to be an auroch on a wall of the Lascaux cave, France. Right: some researchers have argued that the cluster of dots in the top right corner represents the Pleiades star cluster while the dots on the far left are part of Orion and the dots on the auroch's face and horns are part of Taurus. Adapted from Whitehouse, D. (2000, 9 August). Ice age star map discovered. BBC News. http://news.bbc.co.uk/2/hi/science/nature/871930.stm

On the face of it, maps seem like good candidates for communication. Like some art, they seem to take advantage of similarities between the part of the world they're concerned with and what is on paper (or stone or whatever medium). And like sentences they seem to be complex and composed of parts – symbols for roads and buildings, for example, placed in various arrangements.

Blueprints, diagrams, and models are also seldom talked about in the literature on communication, but these objects seem somewhat similar to maps and seem like plausible candidates for communication too. Blueprints, diagrams, and models require interpretation on the part of their users and are usually used to inform and guide some sort of future action. Like maps and art, these objects also often seem to rely on some sort of resemblance to what they're about, and are passed from senders to others.

How does something like a map or a diagram fit into the sender-receiver model? Does it make sense to think of map-making and map use or the creation and use of blueprints and things like diagrams as engaging in communication?

4.2 'X' Marks the Spot

It's easy to see how a map might fit a typical sender-receiver set-up. There is a producer (the cartographer) and a receiver (the map user) who is sometimes the same person and sometimes different. There is something the map-maker is observing that the map is about - broadly speaking, the lay of the land or some other type of area at a certain time - and the person using the map is using it to guide their actions. There could be shared interests, especially if the map is for myself at a later date. Similarly, I could give you a map so that we can meet at a certain camping spot for an enjoyable evening in the wilderness together. How I think the receiver or even my future self will read the map, my marks, will be something I take into account when making it. The receiver on the other end (who, again, could be me) will be trying to make sense of my map, wondering what I might have meant by this mark or that. If things don't go well, then I can start making my maps differently or the receiver (possibly me) can start trying different interpretations. Of course, many maps have keys on them now, but even in those cases, there is often still a lot of interpretive legwork left for receivers, especially if that key is in another language!

So, maps seem to pass the first stage of the test, they seem to have parts that fit into the basic scaffolding of a typical sender-receiver set-up. Is there room for *conventionality* in maps? I think the answer is a glaring yes. We might use red for the oceans instead of blue. If we don't

need the details of things like the borders of states, we can represent various locations simply as

dots on a grid, similar to these maps of locations in the former Soviet Union and Europe from the

American film *Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb* (1964)

(Figure 4.2):[104]

Figure 4.2. Still from the 1964 film *Dr. Strangelove* featuring grid maps (Kubrick 1964, 1:27:44).

The use of grids on maps even has a long history. Here is a map from Xian, China in 1136

(Figure 4.3):

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[104] Point maps appear to be somewhat popular examples among philosophers. See Carnap (1928, §14) and Godfrey-Smith (2015) for discussions involving point maps.

Figure 4.3. The Yu Ji Tu or the "Map of the Tracks of Yu the Great". Pettus, W. B.

(1935). *The Yu Ji Tu (禹迹图) Map* [Stone rubbing]. Retrieved from the Library of

Congress, Geography and Map Division, Special Collections:
https://www.loc.gov/rr/geogmap/guide/gm041001.jpg

This map is known as the Yu Ji Tu (Map of the Tracks of Yu the Great), and is carved into stone

in the Stele Forest. The map is at a scale of 100 li (Chinese mile) squared for every square in the

grid.

The symbols used on maps can be conventional too. We can, for example, use

"mountain" icons (/\) for ranger stations and "ranger station" icons (△) for mountains. And many

different kinds of things can serve as maps. Maps don't have to be made of paper or drawn on

something flat. Consider the famous stick charts used by pre-colonial Marshall Islanders
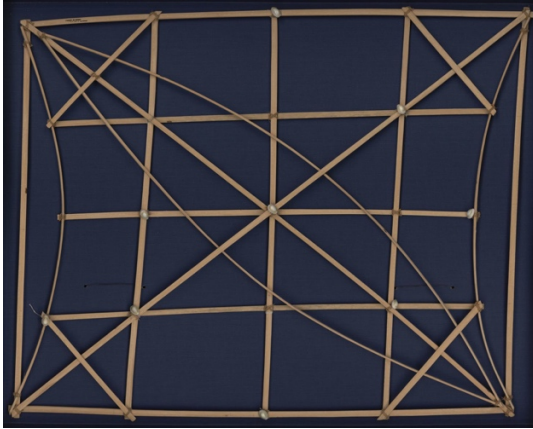
(Figures 4.4, 4.5, 4.6, and 4.7).

Figure 4.4. Marshall Islands stick chart, Mattang type [Majuro, Marshall Islands: s.n., 192-?] [Map] Retrieved from the Library of Congress, https://www.loc.gov/item/2010586180/
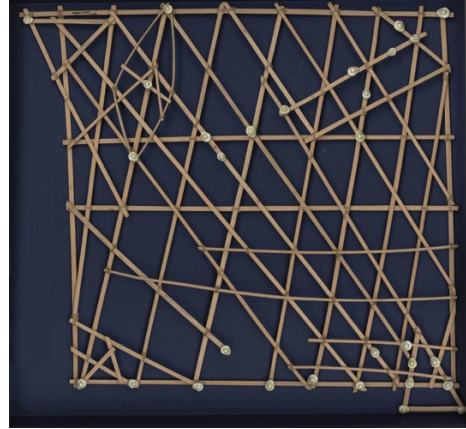

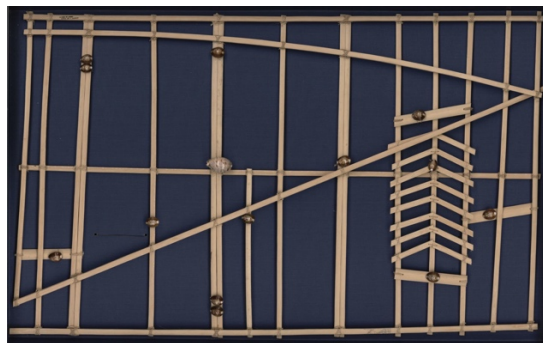*Figure 4.5. Marshall Islands stick chart, Rebbelib type* [Majuro, Marshall Islands: s.n., 192-?] [Map] Retrieved from the Library of Congress, https://www.loc.gov/item/2010586182/

Figure 4.6. Marshall Islands stick chart, Meddo type [Majuro, Marshall Islands: s.n., 192-?] [Map] Retrieved from the Library of Congress, https://www.loc.gov/item/2010586181/
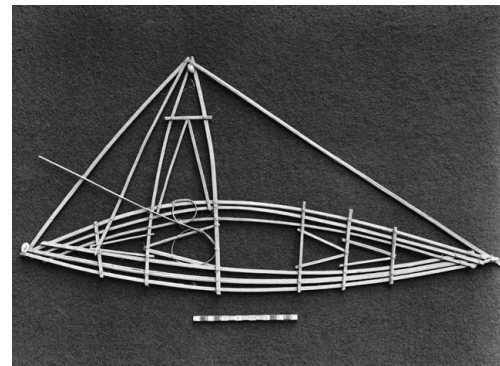

Figure 4.7. Marshall Islands Sailing Chart made of sticks and shells, tied with palm fibre [Marshall Islands: s.n., n.d] [Map] Royal Commonwealth Society Collection, Cambridge University Library, Cambridge, UK. Retrieved from https://www.lib.cam.ac.uk/collections/depart ments/royal-commonwealth- society/collections/marshall-island-sailing-

In these charts, what might look like nodes are actually physical shells from the beaches of the Marshall Islands. The shells are used to represent various islands. Each straight stick represents

currents or waves around the islands or atolls. The curved sticks represent ocean swells and their

directions - these are thought to be the first maps to do this, to chart ocean swells.[105] In Figure

4.6, the herring bone design represents the influence of the northeast tradewinds on the swells

near Jaluit Atoll. How waves converged on or deflected from islands is also sometimes recorded

in these charts. A Marshallese navigator at sea would use their chart and the wave patterns they

observed or felt from their boat to figure out their relative location. Charts often represented

how much time it took to get from one island to another rather than physical distance. Unlike

with most maps, Islanders would usually memorize these charts before leaving rather than take

them along for further consultation (Spennemann, 1998).

Another interesting case is the wooden Ammassalik maps of the Greenlandic Inuits

depicting the Greenlandic coastlines (Figure 4.8).

[105] Finney, Ben (1998). "13: Nautical Cartography and Traditional Navigation in Oceania". In Woodward, David; Lewis, G. Malcolm. The History of Cartography. 2.3: Cartography in the Traditional African, American, Arctic, Australian, and Pacific Societies. p. 444.

These were three-dimensional tactile maps, possibly helpful for navigation in the dark (Ross, 2003). The physical ridges represent the physical peninsulas, and the indents represent the bays or inlets. The maps could be read up and down as is detailed in the text of the above image.

Then consider the use of globes and other maps that have three-dimensional detail – for example, raised relief maps (Figure 4.9).

Figure 4.9. A raised relief map of Iceland at City Hall in Reykjavik, Iceland. Kennerly, D. H. (2014). Giant relief map of Iceland at Reykjavik City Hall [Photograph]. Retrieved from http://kennerly.com/wp-content/uploads/2014/08/IcelandMap.jpg

Conventionality also comes in other forms. In many cases, the same thing – for example, elevation – can be represented in different ways: three-dimensionally in the case of the raised relief map and two-dimensionally through things like shading in the case of shaded relief maps (standardized in the early 1900s by Swiss cartographer Eduard Imhof) and in the case of topographical maps in the form of contour lines (or isohypses) and Hachures (introduced and

standardized by the Austrian topographer Johann Georg Lehmann in 1799) (Figures 4.10, 4.11,

4.12).

Figure 4.10. Shaded relief map of Australia. [Map]. Earth Observatory, NASA.

Retrieved from https://earthobservatory.nasa.gov/images/5100/australia-shaded-relief-

and-colored-height

Figure 4.11. A Hachure topographical map. Adapted from Cram, G. F. (1887). *Railroad and county map of Arizona* [Map]. Retrieved from the Library of Congress, https://www.loc.gov/resource/g4330.rr001820/
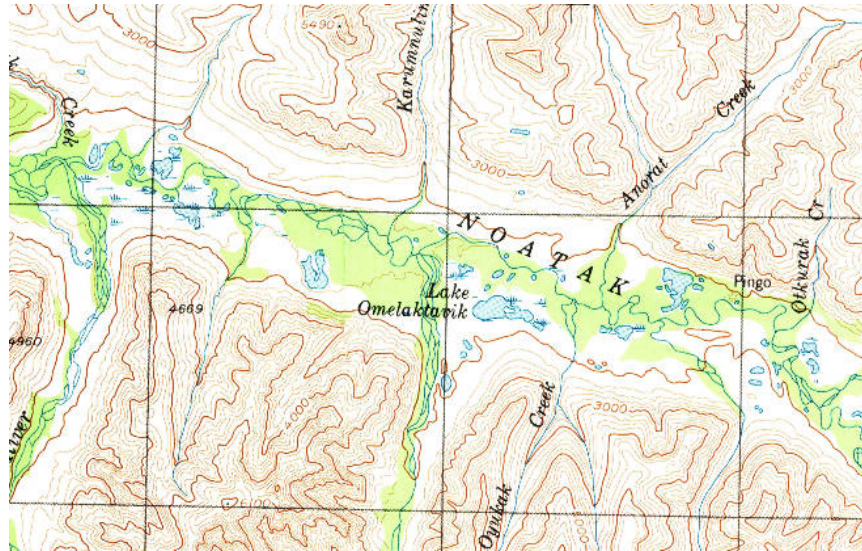
Figure 4.12. A contour topographical map. Adapted from USGS (1956/74). Survey Pass, AK, 1:250,000, [Map]. Retrieved from https://ngmdb.usgs.gov/ht-bin/tv_browse.pl?id=7dfbe37db3900378d604d2fdbc27a27a

And here's one combining contours, color-coding, and directional shading (Figure 4.13).

Figure 4.13. A mixed contour map. Peakbagger (n.d.). [Peakbagger map of Mount Fuji, Japan]. JA: Basemap © 地理院地図(GSI Maps). Retrieved January 25, 2021, https://peakbagger.com/map/BigMap.aspx?cy=35.360638&cx=138.727347&z=15&l=L_JA|L_AG|L_OT|L_OS&hj=0&t=P&d=10882&c=0&a=0&sx=-999&sy=-999&cyn=0

Some maps can even represent their subjects along the axis of *time*. We see this often with weather maps on the news that show us how the cloud cover over our location will change throughout the day (Figure 4.14).
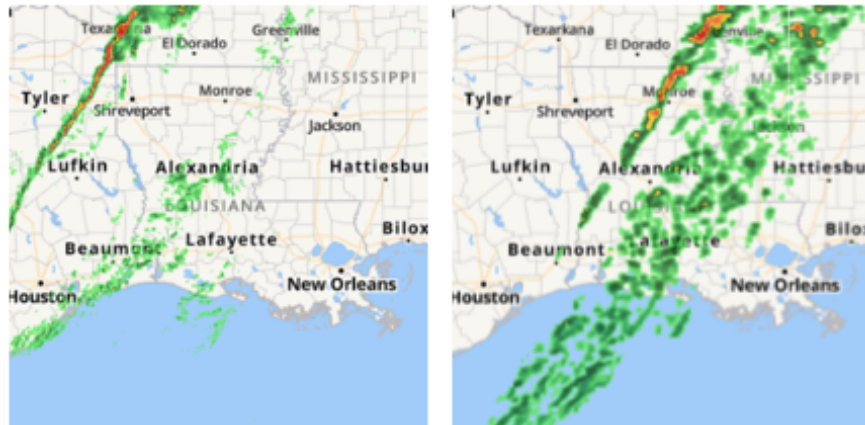
Figure 4.14. A weather map with time. Weather.com (n.d.) [Weather.com map of New Orleans, Louisiana, USA]. Retrieved Jan 25, 2021, from https://weather.com/weather/radar/interactive/l/33fa2c8f1cf13812c5592c7d47572a4fbee6 bd2e370cf094c4373f2758bfe083

This reveals another conventional aspect of maps - they are now even on computers, smart phones, and televisions. They've gone digital.

Getting back to time, time has also been represented in maps in another way aside from what we're familiar with on the morning news. American researchers Gail Langran (1992) and Irina Vasiliev (1996) have documented various ways cartographers have depicted time. Daniel Miller, whose work we discussed a bit in Chapter 3, provides the following example of a map involving the temporal dimension (Figure 4.15).

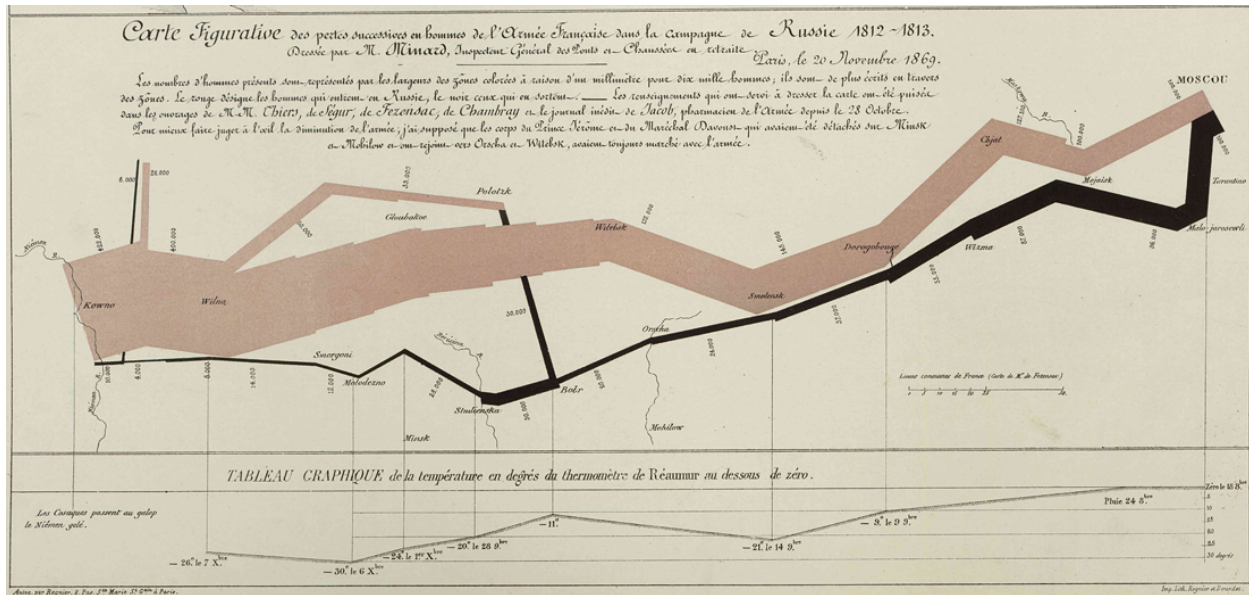*Figure 4.15.* Charles Minard's 1869 graphic representation of Napoleon's Russian campaign. Months are shown in Roman numerals and correlated with temperature and spaced according to distance between landmarks. Minard, C. J. (1781-1870), *Tableaux graphiques et cartes figuratives*, Bibliothèque numérique patrimoniale des ponts et chaussées, accessed December 10, 2020, https://patrimoine.enpc.fr/document/ENPC01_Fol_10975

As I said, Miller (2017) brought this case up in the context of arguing that music scores are like maps. That particular topic is still a bit tangential to our immediate discussion, so I'm going to put it off for one more moment, but I will discuss the similarity between maps and sheet music before this chapter's end.

There is also conventionality in maps in another form, in the choice of map *projection*, especially when it comes to mapping the whole earth. A globe can be used as a map, either in a spherical or an elliptical form, but oftentimes having a flat map makes things easier in a practical sense – easier to handle, easier to store. And yet, in making a map of the earth, map-makers must use some sort of "projection" which takes what's on the surface of the somewhat spherical earth and turns it into something that can be placed onto a flat surface. Developed by Flemish

cartographer Gerardus Mercator (1512-1594) in 1569, the Mercator projection is probably the most common way of doing this today (Figure 4.16).
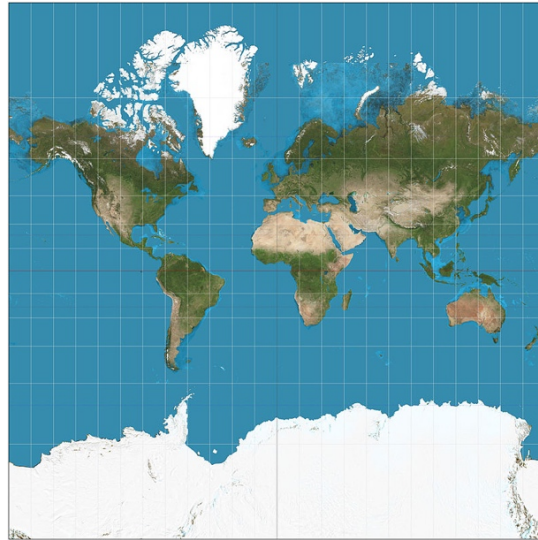
Figure 4.16. Mercator projection map. Strebe, D. R. (2011), *Mercator projection Square* [Map]. Wikipedia Commons.
https://commons.wikimedia.org/wiki/File:Mercator_projection_Square.JPG

The popularity of the Mercator projection compared to other projections is due to its ease of use in maritime navigation. The Mercator projection has two properties in particular that make this the case. One is that the projection results in any course of constant bearing to be represented on the map as a straight line. This allows ships to sail in a constant compass direction for great distances, whereas in the past more constant correction was required resulting in more room for error. The other feature of the Mercator projection that makes it helpful for navigation is that it meets the requirements of a "conformal" map projection, where this means roughly that the projection preserves the angles and shapes of small objects – so, for example, if two trails cross each other at a 45° angle, then their representations on the map will cross at a 45° angle. Here in an example of a conformal mapping.

Figure 4.17. Representation of a conformal mapping. Alexandrov, O. (2008). *Conformal map* [Map]. Wikipedia commons.
https://commons.wikimedia.org/wiki/File:Conformal_map.svg

The mapping *f* in this example, maps pairs of *lines* intersecting at 90° to pairs of *curves* still intersecting at 90°. The making of a Mercator map in a way is a mapping in the other direction – from a curved earth to a flat map surface. Here are some examples of other map projections that are out there (Figures 4.18, 4.19, and 4.20).
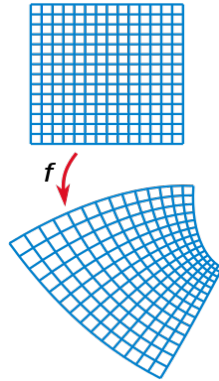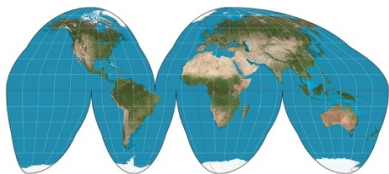

Figure 4.18. Goode homolosine projection. Strebe, D. R. (2011), *Goode homolosine projection SW* [Map]. Wikipedia commons. https://commons.wikimedia.org/wiki/File:Goode_homolosine_projection_SW.jpg

Figure 4.19. Equidistant conic projection. Strebe, D. R. (2014), Equidistant conic projection SW [Map]. Wikipedia commons. https://commons.wikimedia.org/wiki/File:Equidistant_conic_projection_SW.JPG
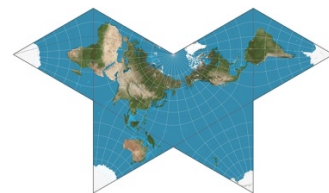
Figure 4.20. Cahill Butterfly projection. Strebe, D. R. (2019), Cahill butterfly conformal projection SW [Map]. Wikipedia commons. https://commons.wikimedia.org/wiki/File:Cahill_butterfly_conformal_projection_SW.jpg_SW.jpg

In representing an elliptical object in two-dimensional form, the Mercader projection brings with it some constraints. In 1828, German mathematician and physicist Carl Friedrich

Gauss (1777-1855) proved in his *Theorema Egregium* that a sphere's surface cannot be represented on a plane (that is, a flat surface) without some sort of distortion. That is, no matter how you do it, when you try to fit what you have on the surface of a globe onto a flat square or rectangle or whatever, there will be some stretching or shrinking of parts of that surface in order to make it fit. This moral applies to elliptical objects as well, such as the earth. What we get is that *any* projection of the earth onto a flat surface, any two-dimensional map of the earth, will be distorted in some way. The Mercator map does this by distorting the size of geographical objects far from the equator. So, for example, Madagascar and the United Kingdom appear to be roughly the same size according to the Mercator map, when in reality Madagascar is closer to twice the size of the UK.
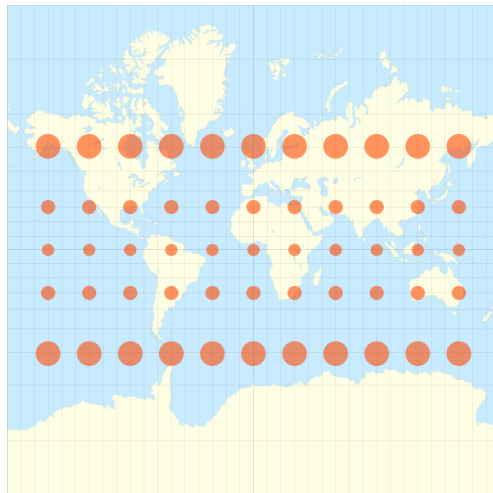
Figure 4.21. A Tissot indicatrix, first developed by French mathematician Nicolas Auguste Tissot in 1859 to illustrate map projection distortion. Gaba, E. (2008). *Tissot indicatrix world map Mercator proj* [Map]. Wikipedia commons. https://commons.wikimedia.org/wiki/File:Tissot_indicatrix_world_map_Mercator_proj.s vg

Another type of projection, the azimuthal equidistant projection, represents distances and directions more accurately at the center point, and distorts shapes and sizes as one moves out.
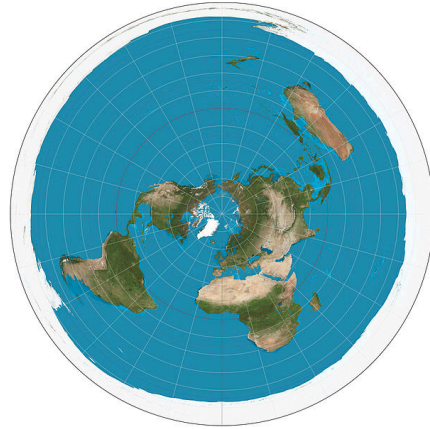
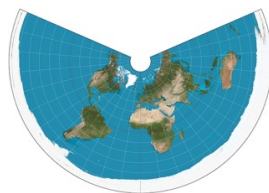*Figure 4.22.* An azimuthal equidistant projection. Strebe, D. R. (2011). *Azimuthal equidistant projection SW* [Map]. Wikipedia commons.

https://commons.wikimedia.org/wiki/File:Azimuthal_equidistant_projection_SW.jpg
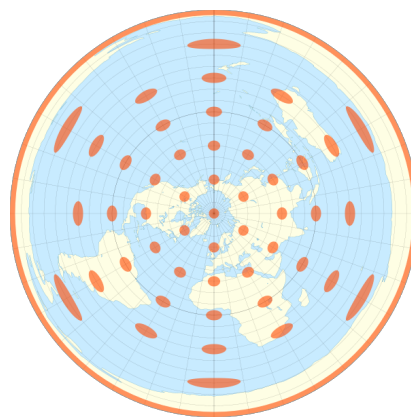
Figure 4.23. An azimuthal equidistant projection with Tissot's Indicatrices. Kunimune, J. (2018). Azimuthal Equidistant with Tissot's Indicatrices of Distortion [Map]. Wikipedia commons.

https://commons.wikimedia.org/wiki/File:Azimuthal_equidistant_projection_SW.jpg

What we seem to get is that there are at least some constraints on the conventionality of maps given what we want them to do – certain moves bring certain consequences. There are certain limits to what can be done given what you want out of a map. I'd like to discuss a few more of these.

Consider things like the "Four Color Theorem". In 1852, South African mathematician Francis Guthrie (1831-1899) was trying to color a map of the counties of England, and noticed that four colors were all that was needed. He asked his brother Frederick (1833-1886), who then asked British mathematician Augustus De Morgan (1806-1871), if it was true that any map can be colored using four colors such that adjacent regions (i.e. regions that share borders) receive different colors. In 1976, the four-color theorem was proved by American mathematicians Kenneth Appel and Wolfgang Haken.
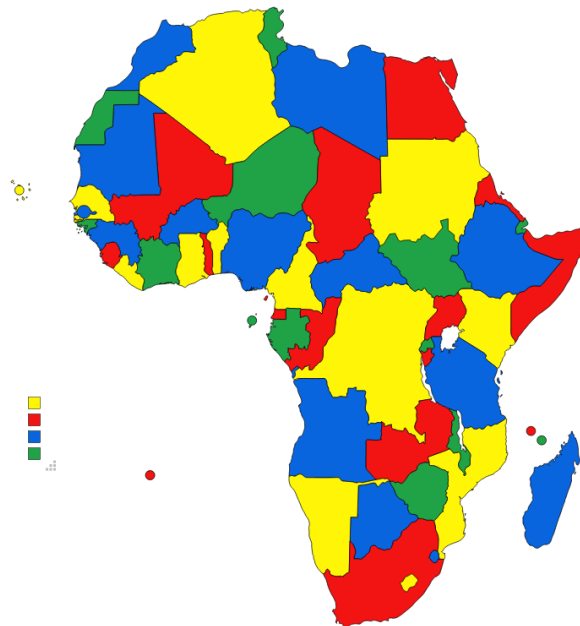
Figure 4.24. A four-color theorem map of Africa. MapChart. (n.d.). [MapChart map of Africa]. November 23, 2020, https://mapchart.net/africa.html

A related question we might ask is what it takes *minimally* for something to work as a map as far as color or some other distinguishing feature goes. I think the obvious answer is two – there must be two different colors, or shades, or distinguishable features. As long as there is simply a background color (for example, a piece of white paper), a map-maker, in many cases, will be fine with nothing more than one other color that can be used for all the other purposes (for example,

using a sharpie on a white sheet of paper to draw out rivers and trail locations). They could even just emboss the paper, or cut marks into it. What about if just one color or distinguishable feature is available? For example, a blank piece of paper that the author cannot write or emboss or mark in any way? I think the answer is that a single colored sheet of paper could act as a signal in some game, but it could not act as a map. It would be a signal that does not help the receiver *navigate*. I'll explain more about what I mean by this, how maps work, what it takes for something to function as a map, in the next section, but before that I'd like to mention just one more way in which maps can be conventional and yet be constrained. I'll leave the rest to be covered as we go along.

Consider the grid map example again. It raises a good question. How abstract can a map go? In Chapter 3, I talked about musical scores and similarities a bit. I brought up Liz Camp and the idea of "isomorphism". Let's talk about that idea now. Here's a quote about isomorphism from Camp (2007):

> [A]lthough maps employ discrete syntactic constituents with a significantly
> conventionalized semantics, there's still a significant interaction between their
> formal properties and mode of combination and what they represent.
> Nonetheless, the only strong constraint on icons employed by cartographic
> systems, and on their potential semantic values, is that the icons' own physical
> features can't conflict with the principles of spatial isomorphism. Thus, one can't
> represent a street with a circle, not because it would be too arbitrary, but because
> this would make it impossible to place the icon in a spatial configuration that

reflects the spatial structure of the represented content: for instance, one couldn't

depict two streets as parallel, or as intersecting. (p. 159)

I mostly agree with what Camp says in this passage, though I think the addition of the element of

time to certain maps would mean that this sort of thing should apply to the temporal realm too.

And given the three-dimensional character of some maps, it would seem the spatial sense Camp

talks about should include depth as well. In any case, the main thing Camp seems to be

suggesting is that some similarity between signals and their subjects is important in things like

maps, that it's important maps somehow reflect certain relationships between certain elements of

the things they're about.

Hold that thought. I'd like now to discuss how maps work. I'll bring Camp's idea back

into play as we go along, trying my best to make more sense of it along the way.

4.3 Fathoming It Out

If maps are communicative devices and they can be so varied, how do they work? In a 2013

essay discussing representation, British philosopher Simon Blackburn offers a suggestion

articulated in terms originally due to American philosopher Wilfred Sellars.[106] Maps have *entry*

and *exit* rules. Here is Blackburn's take:

I could put this in Sellarsian terms by saying that Captain Cook, for instance,

might literally have had an entry rule for an element of his chart. You do not

write a figure indicating a depth unless you have dropped a piece of lead to the

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[106] Thank you to Peter Godfrey-Smith who discussed this case in his Pragmatism course at the Graduate Center, CUNY.

bottom and measured the number of marks on a line. Had he not followed many

such rules meticulously, his charts would not be revered, as they are, for their

representational accuracy. There are also exit rules or in other words, ways to use

his chart to navigate waters around the coast. The chart is useful, of course,

because there is a harmony between the entry rule, getting the chart to say that

there are two fathoms of water in a straight, say, and the exit rule or practice,

which gives you success in sailing a boat drawing anything less than two fathoms,

but no more, through the straight. But there is no useful contrast here between

coping and copying: the chart enables you to cope because it represents correctly

the amount of water in the straight. There is no other explanation of the successes

that attend sailors who use it. (p. 73)

As Godfrey-Smith points out, the entry and exit rules Blackburn writes about are very similar to

the sender and receiver rules in the Lewis model. Consider the Woodward case. Entry rule: if

you need to meet, place the pot on the left side of the balcony. Exit rule: if you see the potted

plant on the left side of the balcony, go to the meet up spot.

But Blackburn also talks about *harmony*. This is what he says explains the success of the

maps. Yet what exactly is this harmony Blackburn is speaking about and how is it achieved?

Blackburn doesn't say. If we look at things from the sender-receiver point of view, however,

perhaps we can say that this harmony occurs when the combination of two sets of rules (sender

and receiver rules) provides a solution to a sender-receiver game. This harmony could come

about by any of the mechanisms we've discussed already: learning, copying, some form of

selection. Whether this is the sort of thing Blackburn has in mind, however, or would approve of, is hard to say, but it seems to fit the model.

Blackburn also mentions that maps tend to take advantage of certain similarities or resemblances to what they represent – blue for water, green for trees. We as creators of maps usually expect others to readily pick up on similarities, and receivers more or less typically expect producers to take advantage of resemblances. We know this doesn't have to be the case given the room for conventionality, so why do we see this? Blackburn's reply seems to be that *copying* allows for the map to work, for users to *cope*. But his response isn't filled out much more than that. I'm not sure why this tendency for us to make maps that look so similar to their target domains is there. There are many reasons this tendency could have come about. Perhaps receivers were predisposed to interpret things iconically, senders took advantage of that, and a signaling system got off the ground – similar to how much depicting communicative art probably came about. But we know a map doesn't have to be a *perfect* copy to help its users cope. So, what else might Blackburn mean?

The general idea is that maps tend to capture what the world looks like in some sense and that this is what helps receivers successfully negotiate their way through the world. But maps are not just pictures and not *all* similarities seem to need to be used. Even if the colors of parts on a map are different than those of real-world counterparts, or tall mountains are drawn as short, they can still function as maps, as representations in some sense of some part of the world. What seems to be important really is that – other details stripped away – there remains some particular relationship between the relations between certain elements on the map and the relations between certain bits of the world (or in the sky, or whatever). How at least some parts of a map are

arranged and *match up* with counterparts in the real world is important. That this notch on the

wooden Inuit map is next to this one matters – whereas the color of the notches doesn't. That the

shell on the Marshall Islander's map is to the left of the herring bone design and not to the right

of it matters. That this mountain is to the left of that river and not in front of it. This seems to be

in the realm of Camp's idea of isomorphism, but it's hard to say if it's the same thing –

unfortunately, there's simply not enough to go off in the literature. Nonetheless, there's another

sort of isomorphism that Camp's view could be about, and I'll discuss that in a just a moment.

But briefly, consider that with maps often if there's not a mountain in one spot, there's

something else, even just flat land.
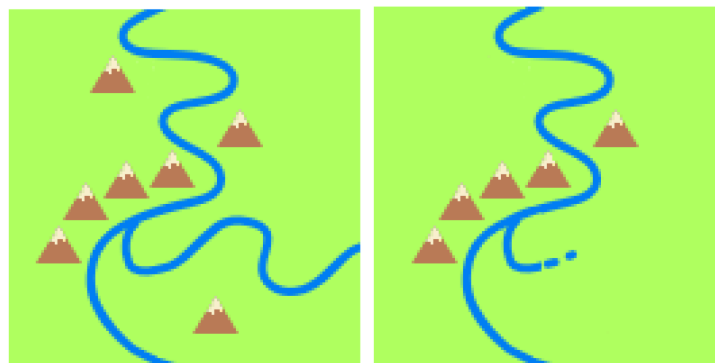
Figure 4.25. Example of a purpose restrictive map. The map on the left is a detailed map
of a certain location. The map on the right is a map of the same area but with details
restricted to just one mountain range.

Italian philosophers Roberto Casati and Achille Varzi (1999) point out this sort of feature and

think that it has importance for representation in *all* maps, that the absence of a feature (no

mountain icon here) means the absence of a counterpart in the real world. For them, the removal

of a part of a map means you're now dealing with a map of a different place. American

philosopher Michael Rescorla (2009) takes a similar view. But as Camp points out elsewhere,

non-authoritative or highly purpose restrictive maps might not include everything that could be

represented despite there being symbols that could accommodate them (E. Camp, personal communication, August 29, 2016). I might have a general symbol for mountains, but if I'm only trying to show you in detail one part of an area, say, a particular range, then I might leave mountains and other features in the outlying regions out – not because they aren't there, but because noting them isn't necessary for our purposes. I think Camp is right on this and that this is part of the story. But I might even leave out something on a map by mistake – maybe I forget to draw one of the 1000s of miles of trails in the Sierra Nevada Mountains or I draw one of them going in slightly the wrong direction - at least intuitively this is still a map of the same place. I might even *intentionally* add something that isn't there, say, a town or a street. Some map-makers have done this in order to be able to capture plagiarizers – these features are sometimes known as "trap streets". Then consider that Google Earth and many historical maps seem to have included for some time the non-existent Sandy Island of New Caledonia, a result simply of repeated human error. I take it most people would agree that the Google Earth map was still a map of the Earth. And so, it seems a map can still be *of* something even if it doesn't include all the details, or perhaps has too many, or perhaps even if there are other issues.

This discussion should seem familiar as it mirrors our discussion earlier in Chapter 3 about art, accuracy, and things like resolution. Coincidentally, in the Blackburn quote above, he also talks about accuracy. We often don't describe maps as true or false but as more or less accurate.[107] This is what we see going on in the case with the hiking trails. This is something a bit different than what we find in the original Lewis model. And indeed, much of the history of maps revolves around the introduction of new tools and new techniques in the search for greater

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[107] Godfrey-Smith in lecture and (2015) also notes this feature of maps and provides a rough account of isomorphism, including some of the problems with that rendering.

accuracy of various forms in map production and interpretation. The use of compasses and cardinal directions, sextants, and protractors.

But now recall our lesson from Chapter 1: there can be truth *within* a signaling system even though the way that system carves up the world is conventional, and what's more we need not adopt any sort of strong realism when making this move.[108] Maps, as signals, seem to work the same way and be subject to the same arguments. Maps don't need to reflect obvious ways of carving up the world – lands masses and bodies of water. Maps don't need to do this, can be made in radically different ways, carve the world up in radically different ways, leave things out, and yet we are still able to make true or false claims using them. As I said earlier, a map could be made using just dots (representing locations) and a grid system. In such a case, if X is a square on the grid and Vancouver is in it or not, we could say, for example, "Vancouver, British Columbia is in square X", and that statement would be true or false. Accuracy can play a role in maps in this relative sense too.[109]

Standards of measurement are similar. We don't have to use Fahrenheit for measuring temperature - we can use Celsius, or Kelvin. None of the standards is the *true* or *right* way of carving things up, of talking about temperature. It's just that some ways of measuring it or representing it are more useful or easier to use in certain contexts than others, and yet we can still use the objects and using their rules for sending and receiving, make true or false, accurate or less accurate, claims with them. That it's 90 degrees Fahrenheit out rather than 95.

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[108] And if Barrett is right, we seemingly have good reasons not to adopt a strong realism.
[109] Godfrey-Smith in lecture and (2015) takes a similar stance regarding accuracy in maps, approaching the problem from a different direction and also gesturing toward a version of anti-realism. However, it's not clear how far Godfrey-Smith's version of anti-realism extends.

Nelson Goodman expressed a similar take in his book *Problems and Projects* (1972). In a discussion about what he calls "constructional systems", he talks about maps. In this quote he replies to those who worry about maps reflecting the "true" reality:[110]

> Though a map is derived from observations of a territory, the map lacks the contours, colors, sounds, smells, and life of the territory, and in size, shape, weight, temperature and most other respects may be about as much unlike what it maps as can well be imagined. It may even be very little like other equally good maps of the same territory. A map is a schematic, selective, conventional, condensed, and uniform. And these characteristics are virtues rather than defects. The map not only summarizes, clarifies, and systematizes; it often discloses facts we could hardly learn immediately from our explorations. We may make larger, fuller, and more complicated maps or even three-dimensional models in order to record more information; but this is not always to the good. For when our map becomes as large and in all other respects the same as the territory mapped – and indeed long before this stage is reached – the purposes of a map are no longer served. There is no such thing as a completely unabridged map; for abridgement is intrinsic to mapmaking. This, I think, suggests the answer not only to rampant anti-intellectualism but to many another objection against the abstractness, poverty, artificiality, and general unfaithfulness of constructional systems. Let no one suppose that if a map made according to one scheme of projection is accurate then maps made according to alternative schemes are wrong. And let no one accuse the cartographer of merciless reductionism if his map fails to turn green in

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[110] Thank you to Richard Creath for pointing this quote out to me.

the spring. The anti-intellectualist confronts us with a spurious dilemma. The choice is not between misrepresentation and meticulous reproduction. The relevant question about a system or a map is whether it is serviceable and accurate in the way intended. (Goodman, 1972, p. 15)

As I said, organization – how parts of the map (the mountains, the lakes, etc.) are arranged - seems to matter, seems to be very important. Notice too that in maps certain parts seem to tend to map systematically to certain parts in the world – mountain icons map to mountains; lake icons to lakes. But there's also another sense of organization that is often playing a role here. Consider again the entry and exit rules for Cook's maps. Why does the '2' on the map refer to x distance as measured on the rope? That is, why doesn't that distance x correspond to '3' or '4'? One answer could be that it's arbitrary just as in classical signaling. But what really seems to be going on is that the ordering of numbers is being mapped onto the various depths in a systematic and *sequential* way.[111] It's possible Camp could have something like this in mind when she's talking about isomorphism – this stronger sequential form of it being involved. Think about the blue on a map indicating the sea. Sometimes to indicate a greater depth the shading is made darker on that part of the map. This is like the Woodward case where size of the potted plant maps to how soon he needs to meet. We get this with the Marshall Islander and Inuit maps too. In the first case, distance between shells represents distance between islands; curves the deflection of waves. In the Inuit case, the length and shape of the wood curves and edges correspond to the length and shape of the shorelines and coves. In more modern maps, we see this in the systematic way contour lines are used.

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[111] Godfrey-Smith notes this in his Pragmatism course.

Now let's take a step back and look at the big picture. What we get is rather interesting. Recalling some of our other lessons from Chapter 1, maps, it seems, can be and often are *combinatorial,* and not just that but *compositional* and *encoded* too – just like many other signals. This seems to be part of how they work. Recall the color grid system example from our discussion of syntax in Chapter 1 (Figure 1.7). Many maps seem to be just much more complicated grid cases. And yet, maps need not always adhere strictly to any sort of "sequence". Again, the water can be red. The elevations reversed or mixed. The shading conventions reversed or jumbled.[112]

Why might maps tend to make use of sequences as well as iconic representation and the systematization of things like icons and their referents? As I suggested earlier, one answer or part could be that senders were predisposed to make maps that way for whatever reason. But another answer could be that these ways of making maps make interpretation easier for map users (like us at least). Iconic interpretation can make things fairly obvious – this is why road signs with just figures such as the silhouette of a deer are helpful. When it comes to sequential mapping, it could be it makes it easier to predict, for example, that this darker blue region means this part of the bay will be 15 feet deep given these other two slightly lighter shaded regions were 10 and 5 feet respectively in reality. It could be that having systematized icons allows a user to predict that the next time they get to a place on the map with such and such an icon that there will be a fresh water spring there too.

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[112] One might wonder how wildly different a map can look from its domain before it doesn't really function as a map anymore. I return to that question in a later footnote.

4.4. The Cartography of Power, Thematic Maps, and Other Odds and Ends

So, we've now seen that maps are a form of communication and that they can come in many forms. We've also seen a bit of how they work. I'd like now to focus on a few other ways maps play a communicative role. And I'd like to start with politics.

In a way, we make our world with our maps. There is an area of study in cartography called *critical cartography*, which focuses on how maps are related to power – how they can reflect it and maintain it. Perhaps the most commonly discussed example of this involves the Mercator projection – there's even an episode of the American television series *The West Wing* that dedicates a segment to it (Redford & Sorkin, 2001).[113] The idea is roughly this. The Mercator map, as we've seen, distorts the sizes of various countries and continents. It shows countries nearer the Equator, which happen to typically be non-Western countries, as much smaller than those farther from it, which happen to include North America and Europe. Some authors have suggested that this distortion in size and the widespread use of the Mercator projection has caused people to consider those countries (and their peoples) nearer to the Equator as less important (Rosenberg, 2019). As a result, some people have advocated for different projections to be used more commonly – in the *West Wing* episode, the fictional advocacy group Cartographers for Social Equality suggests the Peters projection, also known as the Gall-Peter's projection (Figure 4.26).

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[113] See Season 2, Episode 16: "Somebody's going to emergency, somebody's going to jail".
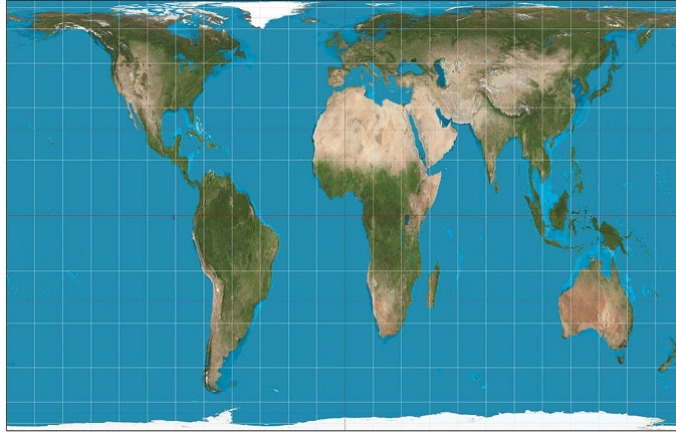
Figure 4.26. Gall-Peter's projection. Strebe, D. R. (2011). *Gall-Peter's projection SW* [Map]. Wikipedia commons. https://commons.wikimedia.org/wiki/File:Gall%E2%80%93Peters_projection_SW.jpg

The Peter's projection works by making all areas have the same size relative to each other, but it does this at the expense of distorting shapes. We get continents that are better reflections of their actual relative sizes but that look stretched out or squished.

I can even see how something as simple as turning a map upside down, or moving where the center of the map is can plausibly have some sort of effect like the one being discussed with the Mercator projection. Shifting what is in the center of the frame could plausibly shift a viewer's focus, shift how much they think that portion of the map must be important relative to the others. In a way, putting some continent or country in the center of a map rather than some other area can make that country or continent seem more like the "center of the world".

There are other ways maps can play a role in communicating and perpetuating power relations. One of the most common examples of this is the replacing of indigenous place and object names with Western ones. Americans can find examples of this on just about every map of their country. Canadians and Australians too. Humphreys Peak in Flagstaff, Arizona, for example, was named in the late 1800s for General Andrew A. Humphreys, a Union general

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during the American Civil War. The peak, however, was known well before that by the Navajo as *Doko'o'osliid*, and it's not like the Navajo no longer live in Arizona – they're still there. Currently, the Western name is on most Arizona maps and what most people know the mountain by. Then simply consider the names of the many states in the US. The area that is now the state of Washington was not called that by the peoples that lived there. I see some of these cases as having similarities to the territory marking case involving the Confederate statues. That the names that have stuck and keep getting perpetuated on maps are the Western ones, reveals something about the power dynamic there.[114]

Then consider recent debates surrounding maps of the South China Sea or of Gaza and the West Bank. The American film *Abominable* (2019), had a scene that included a picture of a map of the South China Sea donning what is known as the "nine-dash-line" (Figure 4.27).

Figure 4.27. Still from the film *Abominable* (Culton 2019, 0:10:14)

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[114] This, of course, isn't to suggest that this sort of thing happens only in the Western world.

The nine-dash-line has a long history but in short is currently being used by China to make territorial assertions against some of its neighbors. Officials from places such as Vietnam, Malaysia, and the Philippines criticized the film because of that scene, because the depiction of that map normalized that territory claim against them. Vietnam even eventually banned the motion picture.

Maps can have a political communicative role, but they can have other communicative roles outside politics or pure navigation too. Take a look at what are called *thematic* maps. These are maps that reveal some sort of data about a subject according to region.

There are thematic maps that show things like the most common religion in an area, the most common language, or which presidential candidate got the most votes (Figure 4.28).

Figure 4.28. A map showing electoral college vote winner by state in the 2008 U.S. presidential election. Nolan, J. V. & Congressional Cartography Program. (2008) United States presidential election, results by state, November 5. [Washington, D.C.: Congressional Cartography Program] [Map] Retrieved from the Library of Congress, https://www.loc.gov/item/2008626935/.

Another common example of a thematic map is a map of different environmental regions. Here's a map showing ecoregions of New Mexico (Figure 4.29).
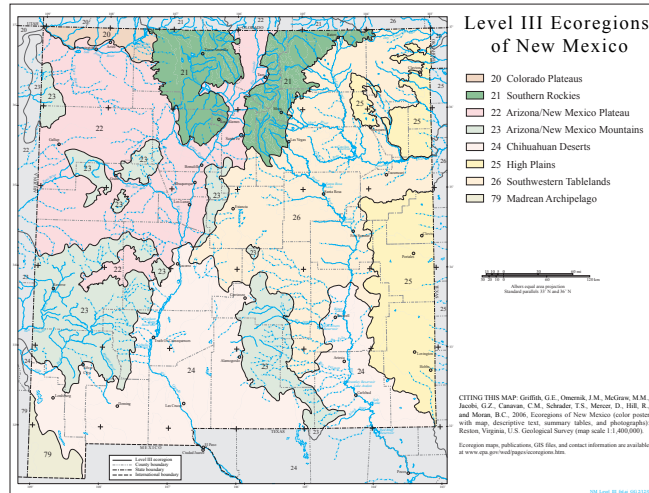
Figure 4.29. A map of New Mexico's various ecoregions. Griffith, G. E. et al., (2006), *Ecoregions of New Mexico* [color poster with map, descriptive text, summary tables, and photographs]. U.S. Geological Survey, Reston, Virginia, (map scale 1:1,400,000). Retrieved from https://www.epa.gov/eco-research/ecoregion-download-files-state-region-6.

Here is a thematic map showing historic Grizzly bear range in the Western United States. Grizzly habitat circa 1850 is in light green. Known habitat circa 1920 is in dark green. The dates on the map represent approximate local extirpations (Figure 4.30).[115]

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[115] These extirpations were largely carried out by European colonists and their descendants, hunters, and the US government. See Leopold (1949) for perhaps the most famous first-hand account of these practices written by a former US Forest Service ranger. See Robinson (2005) for a more detailed historical policy discussion.

Figure 4.30. Map of historic Grizzly bear range in the Western United States. Mattson, D. (n.d.). Historic grizzly range [Map]. Bear Conservation. http://www.bearconservation.org.uk/

In these maps, organization matters. And there are systematic mappings – from color to political party, ecoregion, or habitat. Is there room for some sort of sequence? There's room for that too. For example, consider this map from 1881 showing the population density of administrative divisions in France. (Figure 4.31).
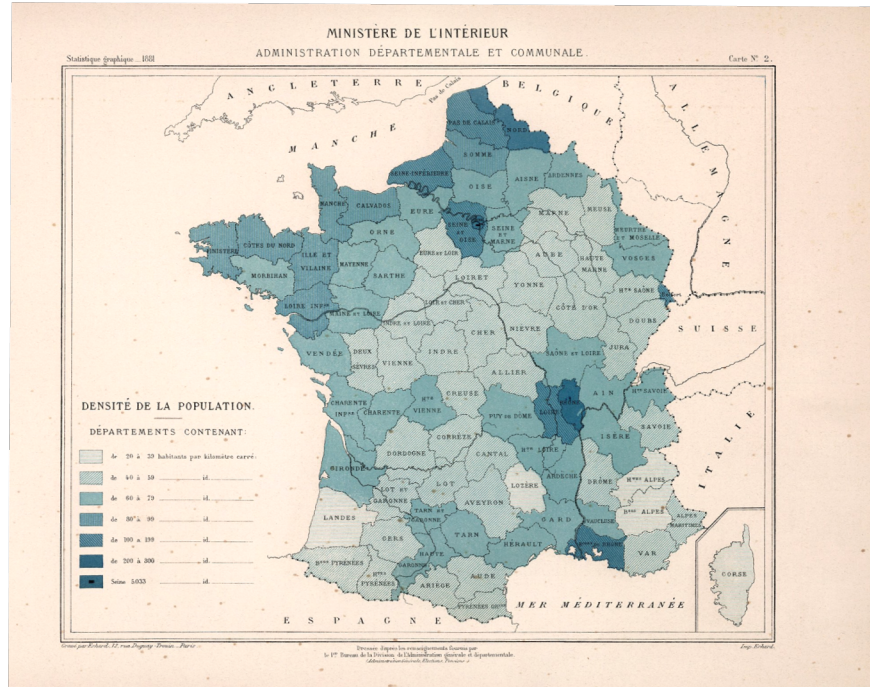
Figure 4.31. 1881 map of population density of France. France. Ministere de l'interieur. Service de la carte de France et de la statistique graphique (1881). Densite de la population. Carte No. 2 [Map]. David Rumsey Map Collection. https://www.davidrumsey.com/luna/servlet/detail/RUMSEY~8~1~311320~90081010:De nsite-de-la-population--Carte-No- ?sort=pub_list_no_initialsort%2Cpub_date%2Cpub_list_no%2Cseries_no#

In this case, the darker a region is painted, the denser the population. In the contour map examples, there's a sequence in the way elevations are represented. In the shaded relief maps, there's a sequence in the shading. There are many ways sequences can have a role. In this map from Austrian philosopher Otto Neurath (1882-1945), there's a sequence from colors to elevation and from number of boxes to population size (Figure 4.32).
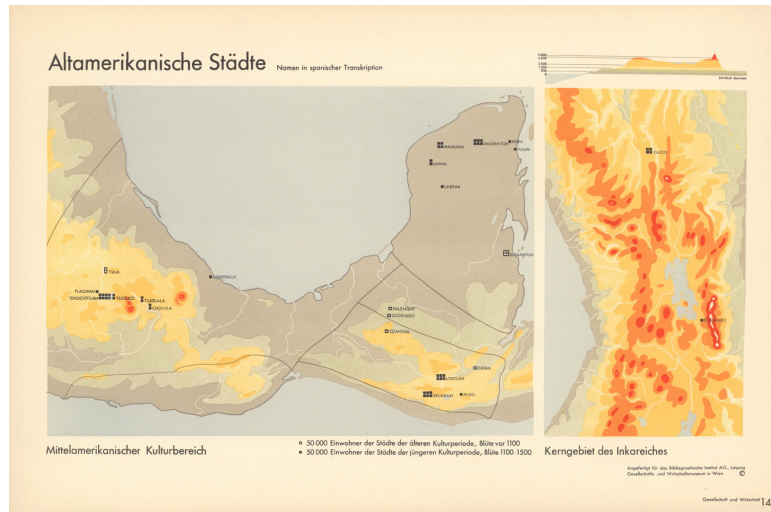
Figure 4.32. Population and elevation map. Neurath, O. (1930). Altamerikanische Städte [Map]. David Rumsey Map Collection. https://www.davidrumsey.com/luna/servlet/detail/RUMSEY~8~1~325160~9009 4115:Altamerikanische-St%C3%A4dte---American- ?sort=pub_list_no_initialsort%2Cpub_date%2Cpub_list_no%2Cseries_no&qvq= q:neurath;sort:pub_list_no_initialsort%2Cpub_date%2Cpub_list_no%2Cseries_n o;lc:RUMSEY~8~1&mi=15&trs=132

Some readers might find some of these maps aesthetically pleasing. In Chapter three, we discussed art. Many maps cross over into art too, also have a decorative or artistic function. Plenty of map-makers don't just care about how well a map helps someone navigate (or gain some information or how accurate it is) but also how it *looks*. Some maps are created partly to be *assessed* or *evaluated* for aesthetic reasons, similar to other forms of art we've talked about. Pictorial maps and illustrated maps are prime examples of this. Many of these also have cartoons in them and are meant to be humorous. Here is an example of an illustrated map of England and Wales from about 1935 (Figure 4.33).

Figure 4.33. A pictorial map of England and Wales. Geographia Limited (1935). The

new Pictorial map of England and Wales [Map]. David Rumsey Historical Map

Collection

https://www.davidrumsey.com/luna/servlet/detail/RUMSEY~8~1~278948~90052007#

The map is crafted with more than navigation in mind, it's also made to be assessed for its

aesthetic qualities and perhaps humor.

Maps like these can cross into the political realm very quickly. Depending on what

cartoons are drawn, how the peoples of the various regions are depicted, these maps can help

maintain or help subvert certain power dynamics, can humanize or de-humanize a people. For

example, an illustrated map of the UK containing demeaning depictions of the Irish would be a

problem. Similarly, so would an illustrated map of the US containing problematic renderings of Native Americans, African-Americans, and so on. Sadly, there are plenty of examples of these of these out there.

Now let's return to a problem that we left incomplete in Chapter 3. Recall Daniel Miller's idea that music scores are like maps. My hope is that by this point it is clear from our discussions so far that maps and musical scores are indeed very similar. They are both signals. They are combinatorial, often encoded, and they make use of similarities and sequences. But I do not want to say that they are the *same* thing, or that *one is the other*. Most maps don't show time in the way a score seems to; most are "static", a bit like a photograph of a place at a particular time – not that maps can't do this, though. Maps are also paradigmatically about navigation – getting somewhere - whereas sheet music just doesn't seem to be that sort of thing and seems to be typically more about what to do with one's hands or feet on a certain instrument or what to do with one's mouth or voice. Yes, a piano player might in a sense be using the sheet music to help himself navigate their way around the keyboard – perhaps there's some sense in which that is a fair use of the English language. But even this seems different from navigation with maps, where there is typically more than one route a person can take using the same map. I can take the path to Beetle bug Lake or I can use the same map to get me to the lakes on the back side of Kaiser Peak, for example, but a score typically doesn't have this sort of possibility. And yet, although I don't know of any cases like this – a sort of "choose your own adventure" song version – I can see how something like that might go, perhaps with reverse playing available too. Maps also seem to differ from sheet music in that maps seem to, as I said, typically be about getting somewhere whereas sheet music seems to be about how to play something so as to *produce* a song, which itself might be a signal.

And yet, these categories seem capable of being blurred. Some sheet music could encode the directions for getting somewhere. This could be possible, for example, if North, South, East, and West were represented by different notes, the duration each note is to be played is mapped to how far one should travel in that direction (given a certain starting point), and the order of the notes mapped to the order in which one should travel in which direction. I'm not aware of any scores of this sort, but something like this is possible. Another way these categories get blurred is if we imagine a case where a map not only tells a user where to go and how to get there and certain spots along the way, but also tells the user which notes to play at the various instruments at those locations along the way, in effect producing a song as the map-user-instrument-player makes their way to the end of their jaunt. Another mixed case is found in the 1985 film *The Goonies*. Not only does One-eyed Willy's map give directions via what appear to be features of terrain and some nautical information (Figure 4.34) as well as a few written clues, but there is a point along the way where users must use a small piece of sheet music written on the back of the map to play a booby trapped organ correctly in order to open the next door to move on (Figure 4.35).

Figure 4.34. One-eyed Willy's map. (Donner 1985, 0:22:30).

Figure 4.35. The back side of One-eyed Willy's map. (Donner 1985, 1:19:31).

As if that isn't enough, the Goonies map even requires users find the spot where the perforations

in an old doubloon line up with a certain set of rocks if they want to find the place where the map

begins (Figure 4.36).

Figure 4.36. The doubloon and rocks. (Donner 1985, 0:27:44).

So, maps can be used to make songs, songs can be used to give directions, both uses can occur at

the same time. And both maps and scores make use of composition and encoding and take

advantage of sequences and similarities. What does all this mean? What are we to think of the

distinction between maps and music scores? I think the answer is that it's better to just see that

these two things – maps and music scores – are simply two somewhat similar, somewhat

different examples of the broader category that is communication. It's not the case that maps are

scores or scores are maps. One isn't the other. Even signals of ordinary language can perform the sort of communicative functions just listed. I can speak out all the possible directions you might take rather than give you a map of all of them; I can simply tell you what keys to play and when rather than hand you some piece of sheet music. It might be slower going or less convenient, might not convey everything "all at once" as many maps and scores seem to do in some sense, might not be something I can look back at repeatedly if I forget a part either. But the point is that despite these things being blurred and the functions being capable of being realized by different forms of communication, there *are* more and less ideal or more and less paradigmatic cases of each of these concepts where the two are noticeably different enough from each other for us to warrant distinguishing them as different kinds. I lean on that. But again, they're all just different forms of the broader category that is communication - in some instances in the real-world more similar, in some instances less.[116]

Shift gears for a moment. One last thing on maps. All this talk about maps so far has been assuming a case where someone is making a map and giving it to someone else. But suppose I hand you a map that I didn't make but bought at the store. I see you lost on the trail. You say you're looking for the trail to Silver Pass, and I hand you a map I bought at the ranger

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[116] Godfrey-Smith (2015) and in lectures seems to suggest that anything sufficiently complex can function as a map of some domain as long as there is some receiver rule that allows it to be used by a receiver that way – this is a rough sketch. But then this gets us into the situation of calling maps some objects that – let alone looking nothing like maps – require extreme decoding efforts and that do not readily reveal, at least to the human eye, the relations between objects in the domain that maps are typically created *to* help reveal. Decryption at the surface level of translating a map from English to French is not so problematic. Some other encrypted maps might still seem to fit fairly well. But how much decoding effort can a piece require before it is no longer really a map or being used as a map rather than as a weird sort of encrypted data set? How readily must relations be revealed for something to count as a map? One part of the answer is that it will be relative to the kind of agents involved. What looks like a good obvious map of Toronto to some alien species might look like an indecipherable mess to us (if we can even use something like it). But another part, I think, is that this is one of those categories without an obvious fine edge – just more and less typical cases. The same worry can be applied to works of art. Is that really a *painting* of a dog rather than just a weird, perhaps aesthetically pleasing, form of acrylic coding? Can an artist call a silver spoon a depiction of a fox as long as they have a receiver rule that explains how its parts map to one? I think it depends on the context, but even then, the best answer might only be a "Well, sort of".

station. Was my act of giving you the map a form of communication? This is a bit of an odd

case to think about in sender-receiver terms, but I think it could fit. One way that might work is

having a set up similar to that of the commissioning case. The map handed over was *chosen* (or

handed over rather than not) because of what it represented, because it was a map that did have

the trail to Silver Pass on it, not one that didn't have it. Add to this that most people are already

trained up to some extent to be able to use a map and how to select maps, and it doesn't seem

implausible that this sort of thing might happen often. I'd imagine places like Disneyland and

National Parks – which offer free maps to visitors and even often have visitors who don't speak

English – see this sort of thing all the time.

I think another way to look at it is as not much different than if you asked me if this was

the way to Mexico and I handed you a card that had "Yes" written on it (and I hadn't made that

card). The primary difference between this case and the map one seems to be the map receiver

having to do more interpretive legwork in the ways I mentioned earlier. But they are still

receiving a signal that has information on it and is a conventional way of communicating that

information. There could still be a back and forth. Hand me the wrong card and maybe I

complain and you try a different card next time – maybe you don't speak English and when you

handed me that card that was your first attempt at a move in that weird signaling game.

Similarly, I hand you the wrong map, you don't get to where you wanted to go, you complain,

and next time someone asks me for a map, I try to do a better job of giving them a helpful one.

In many cases, though, a sender will also try to do some other kind of helping. They'll

try to use their fingers or hands to point out where the receiver is on the map and then where they

need to go and how to get there, tracing out the path with their finger and maybe pointing out

where the cardinal directions are on the map and in the real world. They might use language if the receiver speaks the same language or at least a little bit. What we get is that maps play an interesting role in communication. Not only can they be created and sent as stand-alone signals, they can even be mixed in certain instances with gesture and spoken language creating even more complicated signaling interactions.

That's all I have about maps for now. Now, I'd like to turn to some other candidate communicative objects I mentioned at the begging of this chapter, things like blueprints, models, and diagrams.

4.5 Below Deck: Visions of Home, Bones, and the Starry Sky

Mentioned even less often in discussions of communication are things like blueprints and diagrams. By blueprints, I mean the kind you see used in construction and engineering. By diagrams, I mean things such as charts of the human body. Dewey thought these might play a communicative role. How might that work?

Blueprints seem to function sort of like maps. They are created by a sender as a guide for a receiver. Both are used to guide action. In the case of maps, an action might be, "Walk east here". In the case of a blueprint, an action might be, "Place a 2x4 there". Yet, whereas maps are about the world, with blueprints that sort of interpretation is more challenging. The best I can come up with is that blueprints show how the designer *would like* something to be and what actions should be taken to make that happen. There could be a back and forth. The architect sends off blueprints to the contractor. The contractor builds a structure according to their

interpretation of the blueprints. If the contractor builds things the way the architect wants, then that way of drawing up blueprints and of interpreting them will be reinforced for future interactions; if the contractor builds something other than what the architect wanted, then they may revise their ways of drawing or interpreting future building plans.

Go back to Blackburn's entry and exit rules. We can think of things in these terms here too. The entry rules are something like "If a door is supposed to be there, draw a double line on the corresponding part of the blueprint". An exit rule might be "If there is a double line on some part of the blueprint, then leave a space for a door in the wall of the corresponding part of the house". Another set of rules might be (entry rule) "If this wall is supposed to be x feet tall, then mark x feet on the print" and (exit rule) "If the print says x feet, then make it x feet".

As with maps, how things are arranged on paper matters in blueprints. There will often be some similarity between the parts on paper and the parts in the real world, not just in how they look but in how they are related to each other. Organization in the systematic sense will be important much as in the case of depth in maps – feet for height of a wall vs. depth of a channel. Often sequences will be used.

Take a look at the ship plans for the *HMS Bounty* (Figure 4.37):
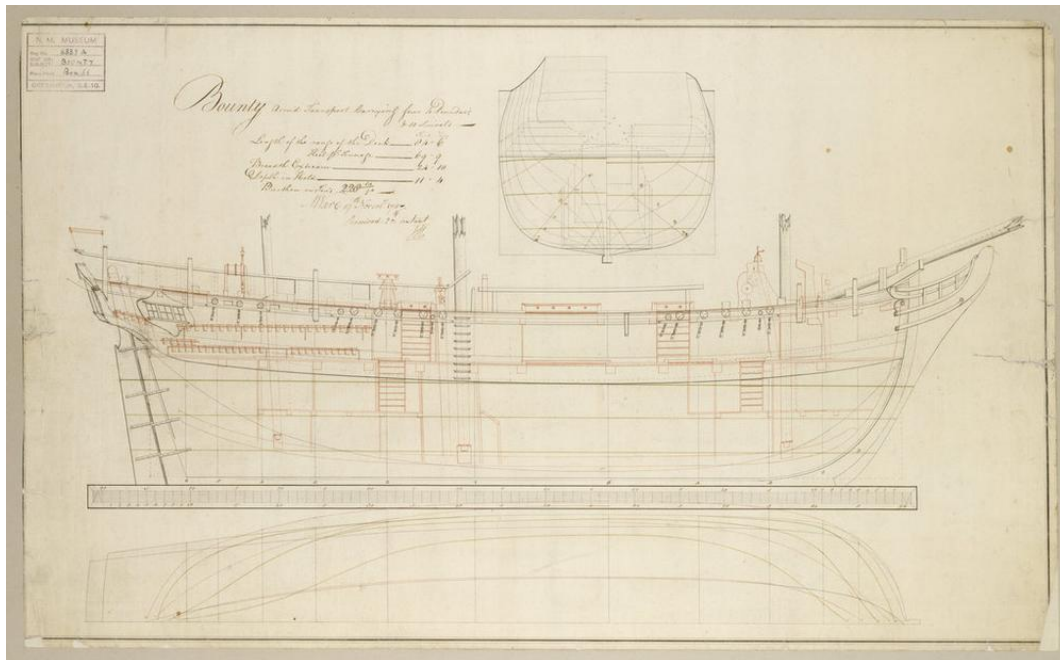
Figure 4.37. Internal sheer and profile Admiralty draught plans for the *HMS Bounty*.
(s.n.) (1887). *HMS Bounty, Lines & Profile* [Ship plans]. Object ID ZAZ6665. Admiralty
Collection, National Maritime Museum, Greenwich, London, UK.
https://collections.rmg.co.uk/collections/objects/86456.html

Here the arrangement of parts matters. There is a systematic mapping of parts on the page to

parts in the real world. And there is a use of mappings to sequences. From length of the ship

and its parts on paper to the length of the ship and its parts in reality – conventionally in ship

plans of this period to a scale of ¼ inch to 1 foot in length. The curvature is mapped too from

angles to angles. The half-breadth plan of the vessel illustrates the shape of the ship's hull at

various waterlines (points where the hull of the ship meets the water). The *Bounty* plan even

includes color coding. In this example, breadfruit racks - important for this ship's particular duty

- and companionways are marked in red.[117] We even get an instance of certain parts being left

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[117] The *Bounty* is famous for the mutiny that occurred on it in 1789 led by Acting Lieutenant Fletcher Christian (1764-1793). Under the command of Captain William Bligh (1754-1817), the ship was to sail to Tahiti to collect breadfruit plants to bring to the Caribbean. The expedition was promoted by the Royal Society and organized by its president at the time Sir Joseph Banks (1743-1820). Banks and others wagered breadfruit might grow well in the Caribbean and could serve as an inexpensive food source for plantation owners there to provide the people they enslaved.

out yet this still pretty obviously counting as a set of plans *of* the *Bounty* - if you look at the bowsprit, foremast, mainmast, and mizzenmast in the plans, you'll notice they end – even seem to be drawn *broken* - before you get to the sails.

As with maps, there is room for conventionality in blueprints. A blueprint can be on paper or on a computer; a certain color line might represent a door and another color line represent a window; I might even draw a simple blueprint for a small job in the sand. But again, as with maps and art, there will be some limits. Camp's remarks on dots and parallel lines would seem to apply, the need for abstraction we talked about in maps, and so on.

Diagrams fit an analysis in terms of senders and receivers too. Like a map, a diagram of, say, the circulatory system helps a receiver find their way around – in this case, in the human body. There will be a sender – the diagram maker – and a receiver – the doctor or nurse using it. What is being observed by the sender? Roughly the state of the body, the way its parts are arranged. What are the receiver's actions? Whatever procedures or operations need to be performed. How could this sort of thing get off the ground? Doctors want to do the best job they can of helping their patients. Sender doctors want this, receiver doctors want this, and patients want this. Sender doctors then design diagrams to try to do that. If the diagrams help, this is good for everyone and they make and distribute more diagrams like those; if they don't work, they try to do things differently.

As with maps and blueprints, the idea of entry and exit rules is applicable here too. An entry rule for a circulatory system diagram might be something like "If there's a vein there in most people, draw a red line here on the diagram" and an exit rule might be "If there's a red line there on the diagram, then you can insert an IV needle here on the patient".

Like a map or blueprint, relations between parts will matter. It matters that the lungs are represented as being behind the ribcage and the heart as roughly between them. Systematic organization and sequencing might matter too – for example, in the circulatory system, bigger veins or arteries might be drawn wider or in darker red. As with maps, the absence of a feature on a diagram might represent an absence in the target, but it need not – for example, when a diagram of the circulatory system doesn't include all of the bones or the nervous system. And importantly, conventionality – to some degree – has a place here too. Veins can be drawn red or green or blue, for example, and so on.

Here is an example of a diagram of the right side of the neck from *Gray's Anatomy* (1858) (Figure 4.38).
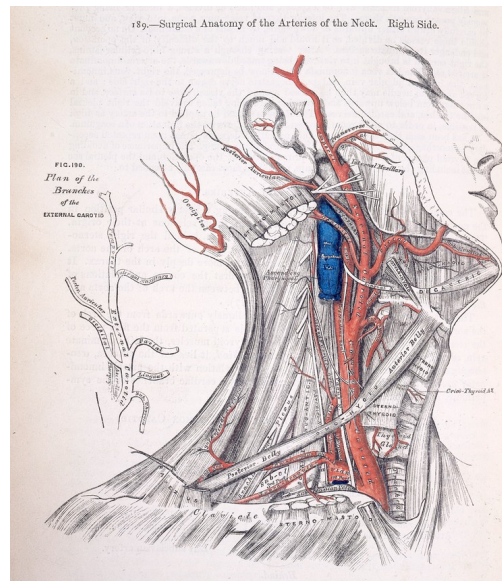
Figure 4.38. Surgical Anatomy of the Arteries of the neck. Right side. [Illustration] In Gray H., and Carter, H, V. (1858), *Anatomy Descriptive and Surgical*, London: John W. Parker and Son, p. 316, plate 189. Wellcome Collection. https://wellcomecollection.org/images?query=wkyuvavb

The arteries are marked in red and the veins in blue (in this case just the jugular and subclavian). The diameter of the arteries and veins and capillaries and so on in the diagram are drawn to map fairy systematically to what we see in the real world. We also have the arrangement of parts and organization mattering. And yet, there is still room in this diagram for leaving some things out – there are no legs, no hands, there's no torso. Depth is also represented through shading and the placement of lines over others. A diagram like this could of course be made more systematic in its mappings. Strict procedures could be put in place – entry and exit rules - for how wide to draw a part of some vein given how wide that part is in the subject (or the average subject) for example.

Similar to diagrams and blueprints, and sometimes maps even, are *models*. Architects use models. So do scientists. A model of a building might be helpful for contractors. A model of the solar system might be helpful for people working with satellites or on space travel.

Consider a three-dimensional model of our solar system (Figure 4.39).
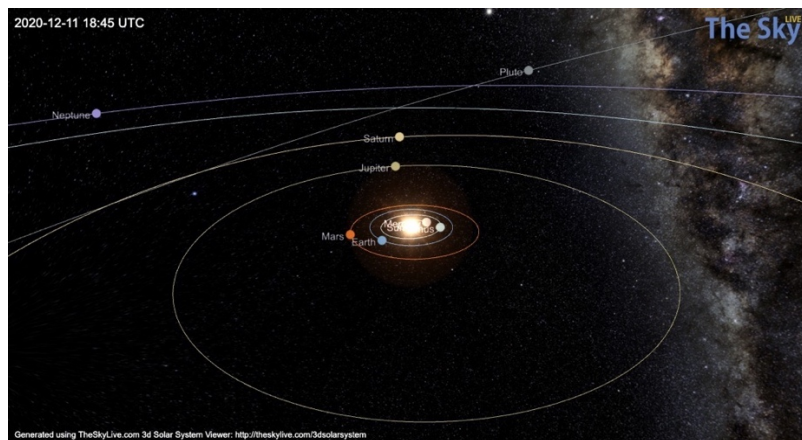
Figure 4.39. A Three-dimensional digital solar system. The Sky Live (2020), [Screenshot, 2020, Dec 11, 18:45, UTC]. [Digital model]. Retrieved from https://theskylive.com/3dsolarsystem?date=2020-12-11&h=18&m=45&.

There are parts. Each sphere in the model might map to a particular planet. In a model of the solar system, arrangement can matter. It matters that the sphere representing Mercury is closer to the sun than Neptune. There is also room for systematic mapping. The distance between the planets in the model might correspond in a systematic way to the distance of the planets in the real solar system. The size of the planets and the color of the planets in the model might correspond in a systematic way to their size and color in the real world. How they revolve around the model sun might correspond systematically to the way the real planets revolve around the real sun. Accuracy can have a place in these cases too. Given the systematic mappings and what rules they follow, someone might end up depicting Saturn as too close to Pluto. What we get with models is that they aren't just combinatorial signals. They're compositional. And they're not just organized but also encoded.

One thing models seem great at is depicting, showing how things look and how they are arranged. They can also be very similar to maps and can plausibly help with certain kinds of navigation. Other kinds of models – architectural or engineering models (sometimes called *maquettes*) – are in some ways also kind of like blueprints and are good at depicting what an architect or engineer wants created, usually to strict scale. Here's a model supposedly created by Italian Renaissance architect Filippo Brunelleschi for guidance with the construction of the Cattedrale di Santa Maria del Fiore (Figure 4.40).

Figure 4.40. Model of the dome for the Cattedrale di Santa Maria del Fiore, Italy. Brunelleschi, F. (1420-). [Model]. Museo dell'Opera del Duomo, Florence, Italy. Retrieved from https://www.wga.hu/html_m/b/brunelle/dome_mod.html

But there's another communicative role some models can play. Some models, thanks to their systematic mappings and arrangements, can help show how certain things work, can help *explain* or reveal things. A good model of the solar system, for example, thanks to the way the planets are arranged and how they rotate and their size and so on, could be able upon inspection to show how the moon passing in front of the sun causes a solar eclipse. And in fact, mechanical models have been made for just this purpose for quite some time. Here is an example of what is known as an orrey model, a type of mechanical planetarium. This one was made by Benjamin Martin (1704-1782) in London in 1766 and used by John Winthrop (1714-1779) to teach astronomy at Harvard (Figure 4.41).

4.6 Dead Men Tell No Tales? Or All Hands on Deck?

Plenty of people make maps. Make them for themselves, make them for friends. The same is true of blueprints, diagrams, and models. Perhaps the most famous maps in human storytelling are treasure maps, created by some captain and their crew to help them find their way back to some buried treasure. It turns out there probably never were any real treasure maps like the kind found in Robert Louis Stevenson's *Treasure Island* (1883).[118] But maps that appear to be made by *groups* or *collectives* – like the captain and crew of a ship - do seem to be fairly common.

I think maps, blueprints, diagrams, and models, can all be seen to fit, in some cases, into the group sender model discussed in Chapter 2 and expanded on in Chapter 3 when we looked at group cases in art. Let's look at the case of maps.

Many maps are created today by private companies. A lot of other maps are created by governments – for example, through the US Geological Survey. In these cases, there is a division of labor in map production. There are CEO's who run the company. There are experts who consult on how best to make maps. And there are the people on the ground doing the survey work and the actual printing. I think many map cases like these will turn out similar to things like large film productions. Who takes credit for how much authorship will be on a case by case basis, but in these larger cases more often that authorship will be somewhat distributed

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[118] See Cordingly (1995), for discussion.

with more of it falling at the top, with who is making most of the major decisions. But it's also plausible that some of these larger cases might involve collective entities that are closer to the paradigm case of a group agent discussed in Chapter 2 – that is, it could be that the map-making company itself counts as the sender (at least, more than it seems plausible to count the CEOs or some other person). Just as with collective art and other group signals, map-making cases will lie somewhere on a spectrum. There can even be map-making cases that are more dictatorial – more like what we saw in Chapter 2 with the Hobbes cases.

One popular example of a form of collaborative mapping is the OpenStreetMap created by Steve Coast in 2004 and inspired by Wikipedia (Figure 4.42).
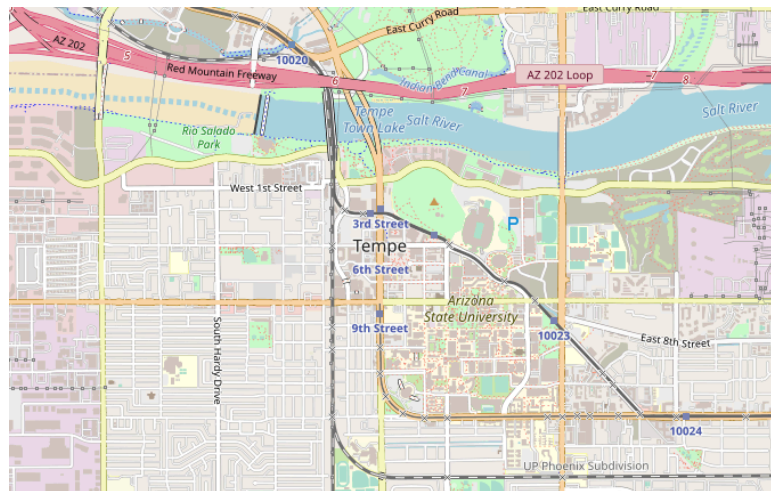
Figure 4.42. OpenStreetMap view of Tempe, Arizona. OpenStreetMap. (n.d.). [OpenStreetMap map of Tempe, Arizona]. Retrieved November 22, 2020, from https://www.openstreetmap.org/#map=14/33.4219/-111.9384

The online OpenStreetMap program is similar to Google Maps in that it has streets and buildings mapped out, but the program allows for a very wide array of editing by its users. Users can add buildings, streets, riverbanks, edit coastlines. They can correct edits that other users have made. It's quite impressive, and it naturally makes one wonder: who is the "author" of this map?

The answer to the authorship question, I think, is tricky in this case. There is the original creator – Steve Coast. I think it was plausible to consider Coast the author at the beginning of the project, but now he is far removed from much of the program's current life and there have since its launch been more than hundreds of thousands of contributors making edits. Another option might be the non-profit that maintains the program, and yet they state they do not determine how the program operates – they just support it. So, naturally the next plausible candidates are the contributors.

But the way the contributors edit OpenStreetMaps is not very organized. Edits are done on one's own and not vetted. They can be corrected by later editors, but it's up to users to notice the defects and take the initiative to change them. Vandalism is also possible – editors can simply go in and intentionally create a street that is not there in the real world or erase one that is. This situation seems similar to the Tunisian collaborative painting case we discussed in Chapter 3, where the "groupiness" of the work came in degrees and depended on how the artists worked together or not. In the case of OpenStreetMaps, there is no explicit decision-making process – users don't talk to each other and agree on where to put a road on the map. But it could be that users, like painters in some collaborative painting cases and musicians in some jamming cases, sort of coalesce around something. How much that happens can come in degrees too, of course. Something like this could be happening in the OpenStreetMaps case. It's not entirely clear how much it is, though. More empirical data would be needed on the map's development over time. But if something like this isn't happening in the OpenStreetMaps case, then, OpenStreetMaps, turns out not really to be a group signal and instead something else. It could be a mish-mash of independent and perhaps some semi-collaborative signals. Or like the analysis of one version of the Tunisian collaborative painting case, it could be more appropriate

to say the person who last updated the work is really the primary author - like when someone adds something to a painting they bought from a store and makes it their own. Either way, it seems there are candidates out there worth looking into as instances of group communication in this area. Some maps, like some works of art, seem plausibly to be made by more than just individuals.

4.7 Land Ho!

In his work *Logic: The Theory of Inquiry* (1938), John Dewey pointed out the lack of attention in the literature on communication being paid to objects such diagrams, blueprints, and maps. For some reason, many authors either ignored these objects when working out their semantic theories or they considered them sort of special cases, things to be dealt with on the side but not as central to communication or at least not similar enough to the central parts of it to warrant comparable analysis.

In this chapter we saw that maps indeed can be communicative devices, and they can communicate much more than just the way some bit of the world is. Maps can be *compositional* and *encoded* - just as art can be and just as most paradigm human language is. It turns out maps are highly conventional. They need not show the way the world really is in all respects, and yet there are some limits on their conventionality. We also took a look at blueprints, diagrams, and models. Many of these objects can be understood as instances of communication. They can be compositional and encoded, make use of mappings and sequences. I'd wager an analysis could be done of some real-world cases showing these objects are also produced at the group level. I

leave that investigation for another time. We've reached our shores. It seems there is much

worth exploring when it comes to things like maps, blueprints and communication. There's

plenty more worth exploring still.

<p style="text-align:center">* * *</p>

Postscript (Coda | Reprise)

One thing philosophers have hoped to do is better understand communication. Historically, much of the focus has been on the human side of the problem, especially on things such as sentences and words. Animal communication was often seen as something off to the side and a different puzzle. Things such as works of art, which often seem to involve meaning of some sort, and things like maps, were also often treated as special cases. With the benefit of Darwin, researchers started to look at thing differently. Then came the tools of mathematics, including the integration of information theory and game theory, and since then, progress on the topic of communication has boomed.

In this dissertation, I took a step back from the individual problems of philosophy of language and animal communication to look, first, at how communication itself works, to look at the big picture questions, the foundational questions, the questions at the heart of this. Then I took what we learned in the first part of the thesis and turned to some cases of communication on the perimeter. We looked at cases that didn't quite fit the traditional sender-receiver set-up, we looked at works of art, maps, and communication between group agents. I tried to see how far the model could go, what we might learn from testing its outer limits.

Here's a short brief of what we learned minus all the fine details. Communication comes in many forms. It comes in the form of simple signals. Even signaling systems with just two signals, states, and acts, and with signalers as cognitively unsophisticated as fireflies might evolve to communicate. Communication can be incredibly complicated and in different ways. It can involve the combination of parts, it can involve arrangements and systematic mappings, the use of sequences. It can involve groups, where a signal is sent not just by some individual but by

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more than one individual and in a way that isn't just metaphorical or loose talk. We saw that this seems plausibly to apply to some non-human agents too. We saw that art fits the sender-receiver model, and that art's many forms can function communicatively in many ways, serve many different purposes. We saw that certain animals seem plausibly to engage in aesthetic communication and that there is a story to tell about communicative art at the evolutionary and the group level. Finally, we saw how maps fit into the model, how this form of communication is similar to but different in certain important respects from other forms we encountered. We saw how navigation played a key role in maps, and how blueprints, diagrams, and models fit into the sender-receiver framework as well.

With all this talk of signals and communication, one might start to wonder: how should we understand the relation of *the model to the world*? I imagine a dubious reader saying, "Look, I get that according to this model we can say that signaling occurs in these various places and at these various levels, but is what this model calls "signaling" *really* communication?"

We come to the table with certain folk concepts and we use words to express them. Some of those folk concepts are expressed by words such as 'sign', 'meaning', and 'symbol'. There are two frameworks at play here or two different *signaling systems*. There is the folk signaling system involving the old handed-down words and its way of using them, and there is the sender-receiver signaling system which also happens to employ some of the same words – 'sign', 'signal' - but with different rules for their use. I take here the same stance I took with respect to the question of meaning in Chapter 1. The two systems – the folk and the sender-receiver - are just two different ways of carving up our world - one more useful in certain

circumstances, the other more useful in others. One isn't reducible to the other, and there is no unified pre-theoretic phenomenon for them both to be right or wrong about.

Think back to the distinction introduced in Chapter 1 between internal and external questions. External questions were *about a language*. Internal questions were questions asked in some language *about the world*. Using this distinction we can reinterpret questions about whether something is *really* a signal as either an *external* question about whether we should use the sender-receiver way of talking about things and using the word 'signal', or as an *internal* question about whether something fits the description of a signal in whatever framework we're using.

There is still much to be done with the sender-receiver model. Despite all we've covered, there are still plenty of important questions to be answered. Jian Shen, in his dissertation (2020), for example, asks whether signaling might be better thought of as an instance of an even more basic phenomenon, something that can apply even to what he calls "para-representational" systems such as the Watt's governor, which Shen argues seems not to have a clear separation between the basic parts of the sender-receiver scaffold. There seems to be some good use to thinking about things Shen's way, but I leave it for readers to look into further. There are also less foundational application questions that researchers can ask. I've said nothing of certain *forms* of art – literature, poetry, clothing design, saddle making, architecture. There are simply too many forms of art to tackle all in one project. I've also not looked into a multitude of other real-world cases to which one might try to apply the model. Biology is ripe for investigation. The communicative behavior of many non-human species is up for grabs. So is a lot of work in archeology, work in cryptography and linguistics, possibly even work in the biology of plants. It

would be nice to see more research on more topics, especially more field work, to see how much more of our world the model can make sense of.

Then there is the classic question of logic. Many philosophers who worked on conventional theories of meaning did so because they also thought a conventional theory of meaning would somehow be connected to a conventional theory of logic. I've stayed away from the logic question in this thesis. Whether logic is conventional is a big question. Surely in some way logic and inference are involved in communication. If I'm hiking in the backcountry of Montana and my horse and I hear some rustling behind some brush up ahead, depending on what my horse does, what sound he makes (signal), for example, I might be able to infer that there's something big back there, that there's a Grizzly or an elk back there. If a moment later my horse gets another look at what's behind the brush and does something else, makes some other noise (another signal), then depending on what that signal was, I might be able to infer that the news is bad - *that there's a Grizzly back there!* - and act accordingly. Somehow these things seem to be connected: logic, inference, communication. It would be nice to see an investigation work through all that.[119]

When it comes to the updated sender-receiver model, I think it is simply a more fruitful way of doing things, of communicating and coordinating, of talking about communication. It seems to capture more, fit and make space for more, seems to be more useful than many previous models and older versions, especially in more rigorous contexts. My hope is that this thesis will have demonstrated the worth of the model for continued exploration, development, and

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[119] It's worth noting that Skyrms talks briefly about logic and inference in a number of his works (2000, 2004, 2010, 2011). There is also some early-stage modelling work out there by Steinert-Threlkeld (2016, 2019) and Franke (2014).

application. Perhaps in the future we'll find that the model has helped us understand communication better, as well as the veritable carnival of signs and signals all around us. It's just one more step in understanding a little bit more of our world, including a little bit more of each other.

<p style="text-align:center">* * *</p>

Creation seems to come out of imperfection. It seems to come out of a striving and a frustration. This is where, I think, language came from. I mean, it came from our desire to transcend our isolation and have some sort of connection with one another. It had to be easy when it was just simple survival. "Water." We came up with a sound for that. "Sabretooth tiger right behind you!" We came up with a sound for that. But when it gets really interesting, I think, is when we use that same system of symbols to communicate all the abstract and intangible things that we're experiencing. What is "frustration"? Or, what is "anger" or "love"? When I say "love" - the sound comes out of my mouth and it hits the other person's ear, travels through this byzantine conduit in their brain, through their memories of love or lack of love, and they register what I'm saying... and they say yes they understand, but how do I know? Because words are inert. They're just symbols. They're dead - you know? And so much of our experience is intangible. So much of what we perceive cannot be expressed, it's unspeakable. And yet, you know, when we communicate with one another and we feel that we have connected - and we think we're understood, I think we have a feeling of almost spiritual communion... and that feeling may be transient, but I think it's what we live for.

- *Waking Life* (Linklater 2001, 0:11:23)

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