

Chapter 2

On Biological and Verbal Camouflage: The Strategic Use of Models in Non-Scientific Thinking

Abstract The chapter approaches the topic of models *as mental models* by a survey of animal cognition studies linked to camouflage, to sustain the claim that biological camouflage can be seen as the operationalization—also in extremely rudimentary cognitive systems—of mental models representing the other’s cognitive system. In this same chapter, by analyzing the inferential operations (supported by the aforementioned modeling activity) underpinning camouflage-breaking strategies, I will try to explain how the same tacit use of models representing the other’s cognitive abilities is at play in human communication, when enacting and uncovering linguistic deception.

2.1 Introduction

The second half of past century witnessed a flourishing of ethological and biological studies concerning the issue of camouflage as related to animal cognition.¹ Still, it is important to notice how biological and cognitive studies have been focusing on the neurological and physiological correlates of camouflage dynamics but less on the inferential grounding.²

Concentrating on the inferential ground underpinning camouflage mechanisms can be of extreme interest because of the richness of the afforded theoretical implications, which include analogical suggestions that might be developed in an epistemological framework, in order to uncover new but similar *pattern* in other fields: this will allow me to rely on considerations of biological concern as a tentative theoretical tool for further investigations transcending biology and ethology to land in a more philosophical framework.

¹ A recent special issue of the *Philosophical Transactions of the Royal Society B: Biological Sciences*, introduced by Stevens and Merilaita (2009), does provide both the state of the art and new insights in the field.

² If all inference is, in fact, a form of sign activity—as received from the Peircean tradition—and we use the word sign to include feelings, images, conceptions, and other representations, then we must include unconscious thought among the model-based ways of moral thinking.

Indeed, while the notion of camouflage I will start from originates from biological studies and describes a range of strategies used by organisms to dissimulate their presence in the environment, it has been frequently borrowed by other semantic fields as it is possible to camouflage one's position, intentions, opinion, etc.: an interesting conceptual continuum between the multiple denotations of camouflage seems to emerge from the multiple homologies. The etymology of the word itself suggests that the origin is french French, from *camoufler* 'to disguise' (originally thieves' slang), from Italian *camuffare* 'disguise, deceive,' perhaps by association with French *camouflet* 'whiff of smoke in the face.' The goal I set before the reader and myself in this chapter is to vindicate the strategic nature of camouflage, both in its ethological and human connotation, through a full appreciation of its theoretical foundations.

Following this insight, the beginning of this chapter aims at sketching out the main forms of camouflage as understood within their biological framework, insisting on the inferential dynamics underdetermined and allowing camouflage, making use of the concept of abduction as received from the Peircean heritage. Then, I will explore some of the most relevant occurrences of camouflage in dialectical and rhetorical perspectives. Finally, I will draw the sums of the comparison between linguistic and biological camouflage, showing how strategies aimed at debunking verbal camouflage correspond to their respective countermeasures in biologically-intended camouflage.

2.2 Understanding Camouflage as Inferential Warfare

2.2.1 Situating Camouflage in the Environment

It might be good to start by considering how animated beings do not merely "contemplate" their environment in an uninterested fashion, but as *survival machines* they cannot separate their perceiving from continuous activities of problem-solving—which could be ultimately described as cognition. An organism's surroundings are not uniformly relevant for the organism itself.

An important part of a living agent's ecology is composed by *other agents*: other agents are constituted of matter as any other part of the environment—rocks, plants, dirt, water, etc.—but on top of the efficient causation displayed by non-living elements they exhibit the possibility of *semiotic causation* (Hoffmeyer 2008), as they are capable of producing effects guided by inferences they operate on other elements of *their own environment*.³

³It might be unfair to acknowledge plants only as passive elements being part of an environment, only passible of efficient causation: it has been suggested that even plants can be described as displaying a kind of embodied cognition (Calvo and Keijzer 2009) and are therefore concerned by semiotic causation as well. The perceptual and inferential horizon at play is of course radically incommunicable with respect to ours and to that of non-human animals we able to refer to.

This is true for human agents too, as they look at a natural landscape, for instance, their attention is automatically driven to search for and investigate little movements, glitters, shadows that could signify the presence of life forms.⁴

The ecological problem concerning external agency that I am beginning to delineate is quite complex, and it will be at the core of my interest for spelling out the *patterns of rationality* setting the title of this book: to begin with, the notions of *external* environment and that of *other* agents are not absolute but rather immediately rise the “with respect to?” question. It is easy to understand that every agent can be part of any other agent’s ecology: even human beings are, as individuals, constituents of each other’s environment, we are part of each other’s “surroundings.”

To introduce this investigation, it might be interesting to rely on the semiotic concept of *semiosphere*, modeled upon that of biosphere: as contended by Hoffmeyer, “[...] this semiosphere truly is a sphere like the atmosphere, the hydrosphere or the biosphere, in that it penetrates these spheres for living organisms and consists in communication: sounds, odors, movements, colors, electric fields, waves of any kind, chemical signals, touch, etc.” (Hoffmeyer 2008, p. 153). Every organism has only a *partial* access to this semiosphere, constrained by its situatedness and biological endowments. Such a description is complementary with the eco-psychological concept of affordance⁵ (Gibson 1979), which provides an alternative account of the role of the environment and external—also artifactual—objects and devices, as the source of action possibilities (constraints for allowable actions).

As far as biological camouflage is concerned, interspecific dynamics will matter the most and therefore, wherever possible, ignore the relevance of intraspecific dynamics affecting the definition of environment.⁶ This leads to the formulation of the following working hypotheses, considering as “other agents” organisms that do belong to different species and are therefore potential predators or preys, and not rivals:

1. Every organism normally attempts to detect the presence of other agents and hide its own presence from other agents in the surroundings.

⁴The issue of the relationship between the cognizant and her surroundings will be tackled again in the following chapter, but especially in Part III, when dealing with the study of religion as a cognitive phenomenon (Chaps. 10, 11).

⁵Originally belonging to the conceptual toolbox of ecological psychology, an affordance is a resource or chance that the environment presents to the “specific” organism, such as the availability of water or of finding recovery and concealment. Of course the same part of the environment offers different affordances to different organisms. Part II will further rely on the notion of *affordance*, and hence provide a deeper understanding.

⁶When dealing with intraspecific predation, competition over sexual mates or available resources (such as food or nesting room), it seems apter to consider the external environment as related to every single organism; conversely, if we want to frame interspecific dynamics such as predator-prey ones, symbiotic relationships and so on, it might be simpler to consider the notion of environment as related to a species or at least to a localized population.

2. *Both* predators and preys simultaneously behave according to (1), as organisms tend to avoid recognition by both their predators and their preys.⁷

2.2.2 *Truth and Survival in Agency Detection and Recognition: The Importance of Animal Abduction*

Sensorial perception is what organisms must rely on in order to recognize the presence of other organisms in their proximities. What senses pick up is not an immediate picture of external agency, but a more or less rich complex of signs: these signs mostly partake of the senses of sight, smell and hearing (taste separated from smell, and touch not aimed at picking up vibrations in the ground, seem to provide cues that are more useful to proximally investigate the nature of an organism rather than to infer its presence). The resulting situation is somehow like this: an animal agent must manage to detect the presence of other agents in order to maximize its own chance of survival, and such detection can only be inferred by operating upon meaningful signs. Once the other agent is individuated, the following step consists in the operationalization of the correct “affordances” concerning the detected organism: i.e., the *detector* should not know whether to attack, flee, ignore, etc. the *detected*.

In order to get a better understanding of such cognitive phenomena, we can rely on the powerful vision proposed by philosopher of biology Ruth G. Millikan. She suggests that internal representations of animals might mostly consists of PPR (“*push-me pull-you*” representations), meaning that they are *both aimed at representing a state of affairs and at producing another*, thus suggesting a “chance” for behavior (as

⁷One could start by arguing that these hypotheses could be questioned by referring to the famous *handicap principle* (Zahavi and Zahavi 1993) and *honest costly signaling* theories: part of the handicap principle theory concerns cases in which sign suppression is abandoned favoring a loud semiotic activity by which the predator or the prey signals to its counterpart that the latter has been spotted and will not manage at catching the former off-guard. The (maybe over-)notorious example is that of the gazelle’s “stotting” (i.e. jumping several times up and down): biologists following the handicap principle theory maintain that the stotting behavior is *de facto* a waste of energy that could be employed to run away immediately, but instead this waste of energy (that is, the handicap) is afforded by energetic specimens that therefore convey the message “I am so full of energy that I can even waste it like this, I am not going to get tired that easily!”: the aim is to achieve a win-win balance so that both the predator and the prey avoid an energy-consuming chase or struggle whose outcome is not foreseeable. Nevertheless, it should be considered that honest signaling is enacted only *after* recognition is accomplished: *stealth* attack and defense remain the highest-success strategies for both predators and preys. If this was not the case, it would be legitimate to expect from all living creatures to be flashily colored in orange and pink and extremely loud, all the time, while even the long-time favorite gazelle displays colors useful to blend in the savanna grass. Furthermore, it should be considered that the factuality of the handicap principle has become a hotly debated topic over the past few decades. Since its introduction, it witnessed alternating periods of popularity and periods of decline: such alternation was caused on the one hand by a growth in popularity in humanities and economics separate and unmatched by its biological counterpart, which was on the other hand strongly opposed by influential biologists such as Maynard-Smith, who claimed—among several others—the impossibility to find actual evidence of the handicap principle in nature (Grose 2011).

received by the Gibsonian/affordance tradition). Therefore, the content of a PPR mental representation will never be of a mere contemplative nature as far as animals are concerned (it is not the place to argue whether that can ever be the case with human beings), but it will always propose and enact a behavioral pattern connected with the very same representation.

An animal's action has to be initiated from the animal's own location. So in order to act, the animal has to take account of how the things to be acted on are related to itself, not just how they are related to one another. In the simplest cases, the relevant relation may consist merely in the affording situation's occurring in roughly the same location and at the same time as the animal's perception and consequent action. More typically, it will include a more specific relation to an affording object, such as a spatial relation, or a size relative to the animal's size, or a weight relative to the animal's weight or strength, and so forth (Millikan 2004, p. 19).

In the perspective I have adopted, an abductive model is the fittest one to describe and investigate the formation of those internal representations which animals produce inferring them on the basis of those signs they are able to recover from the environment. It seems therefore legitimate to speak of "animal abduction" (Magnani 2007a).

Abduction, as understood within the Peircean framework, can be accounted for as the process of inferring certain facts and/or laws and hypotheses that render some sentences plausible, that explain (and also sometimes discover) some (eventually new) phenomenon or observation: it is the process of reasoning in which hypotheses are formed and evaluated. Abductive reasoning is active in many scientific disciplines but also in everyday rationality: it is essential in scientific discovery, medical and non medical diagnosis, generation of causal explanations, generations of explanations for the behaviors of others, minds interplay, when for example we attribute intentions to others, empathy, analogy, emotions, as an appraisal of a given situation endowed with an explanatory or instrumental power, etc.

In fact, abduction must not be regarded as a merely sentential inferential process: indeed, many studies explored the existence of "model-based" abductive processes, concerning the exploitation of internalized (or to the manipulation of external) models of diagrams, pictures and so on. Recent studies on abduction opened a much wider field of investigation concerning these multi-modal inferences: survival, for any animate organism, is a matter of coping with the environment and the relationship with the environment is mediated by a series of cues the organism must make sense of in order to generate, even if tacitly, some knowledge it did not possess before.⁸

Traditionally, studies have concentrated on the human dimension of reasoning, nevertheless Peirce himself had stressed several times how the concept of abduction was to be held relevant for a biologically wide description of cognition.

The *making sense of signs* we are dealing with is indeed an abductive activity that human beings share with any organism endowed with a nervous system or, on an even bigger perspective, any organism capable of reacting actively to modifications of its environment. From this perspective humans, and the most part of non-human

⁸Refer Sect. 1.3.2 for a better introduction to the issue of abduction and further references.

animals possess what can be defined as “semiotic brains” (Magnani 2007b), which make up a series of signs and which are engaged in making or manifesting or reacting to a series of signs: through this semiotic activity they are occasionally engaged in being “cognitive agents” (as in the clear case of human beings) or at least in thinking intelligently.⁹ As far as the biological and pre-linguistic levels are concerned, it can be argued that such “mental” representations do not matter for their *truth-reliability* but rather for their *fitness-reliability*¹⁰ (Sage 2004). While our human language-dominated world informs the fact that we are used to consider the notion of truth, naïvely, as correspondence,¹¹ from a biological perspective (which is often engaged by human beings as well) the *favoured* inference is the *most successful* inference, the one leading to survival.

Consider this: according to our common standards of epistemic decency, entertaining a true belief is always better than not entertaining it, especially if the belief concerns an agent’s immediate surroundings. We would say that, for an organism, to be entertain a correspondentist true belief about the presence of a predator is the best way of surviving it. Nevertheless, it is not impossible to imagine a kind of opposite situation, where not detecting a predator allows the prey to go by unharmed, in case the predator is for instance sleeping: should the prey notice the predator and “freak out”, it would make its presence clear and potentially be killed. Thus, not noticing the presence of a predator, not entertaining any form of PPR representation concerning it—and thus not reacting—might be the best way to avoid being noticed in turn and killed: this is clearly a limit example, still it is credible and it shows how in some cases, a potential proto-belief is clearly false, and yet successful.¹² This is similar to how

[...] cautious cognitive faculty that “over detects” dangerous predators (frequently generating the false belief that a predator is nearby) may generate an abundance of false beliefs, though it may turn out to be adaptive because these false beliefs increase an organism’s inclusive fitness (p. 97). [...] The abundance of adaptive false beliefs gives us reason to doubt that true beliefs are more likely to increase an organism’s inclusive fitness than are false beliefs (p. 102) (Sage 2004).

A fundamental feature of abduction is crucial for this discourse. As shown in the Introduction of this book, abduction is not a truth-preserving inference: setting off from a number of true premises, the resulting abductive inference will not be

⁹Semiotic brains, their role in defining human cognition and supporting many kinds of inference will be a pivotal topic in Part III, especially in Chap. 10.

¹⁰Especially when comparing animal fitness and cultural evolution, the concept should be understood in a “loosely Darwinian” connotation. In this book, when I refer to fitness I intend a very informal notion, hinting towards both a rigorous definition of *fitness* and to the one of *welfare*, the latter being less geared towards reproduction and inheritance and more towards the well-being of an organism.

¹¹A belief can be true inasmuch it corresponds to a state of affairs in reality, and we can communicate this belief, build further inferences on it and so on, and we expect the positive or negative outcome of those processes to depend on the truthfulness of the original beliefs.

¹²This argument is akin to Gigerenzer’s famous treatment of *more is less* heuristics (Gigerenzer and Brighton 2009).

necessarily true, but merely *plausible* (it is not the case with deduction, which is a locally correct, truth-preserving reasoning). In this case, abductive mechanisms allow to set off from a number of (phenomenologically) true signs, and come up with an explanation that may not be true (poor epistemic-reliability) and yet enable the survival of the organism (high fitness reliability).

To sum up so far, I am arguing, coherently with Millikan's authoritative observations, that animals' internal representations concerning agency are always strictly related to the agent performing the inference, and cannot be considered from an absolute perspective: we can say that what an animal operationalizes is the other agent's *affordances*, that is what organism *a* can do with organism *b*. As it will be pointed out several times across this book, perception is necessarily agent-dependent, it necessarily concerns the individuation of a proper course of action, and it is not immediate but always mediated, as it ultimately consists in a kind of abductive sense-making representations.¹³

The inference intending the presence of an agent is in fact not a deductive one: if signs *a*, *b* and *c* *necessarily* signified the presence of agent *A*, then natural dynamics as we know them would be extremely different, especially as far as predation is concerned. Conversely, errors and misperceptions can always happen in abductive inferences: this allowed the emergence of a series of gene-phenotypical characteristics, such as the ones we will analyze in the next section, to exploit the more or less narrow *semiotic gap* between the presence of an agent in an environment and the actual possibility to infer its presence from a certain sign configuration.

Such abductive representations seem to be the product of situated abductive inferences and they are in fact peculiar inasmuch "they tell in one undifferentiated breath both what the case is and what to do about it" and they "represent the relation of the representing animal itself to whatever else they also represent" (Millikan 2004, p. 20). This kind of inferential process, residing in the *coupling* of the detector and the detected, is not based upon a random appraisal of an animal's semiotic cloud, but specific sign configurations match certain affordances, which ultimately trace back to the desired property. Jacob and Jannerod's description seems particularly illuminating:

Property *G* matters to the survival of the animal (e.g. a sexually active male competitor or an insect to capture). The animal's sensory mechanism, however, responds to instantiations of property *F*, not property *G*. Often enough in the animal's ecology, instantiations of *F* coincide with instantiations of *G*. So detecting an *F* is a good cue if what enhances the animal's fitness is to produce a behavioral response in the presence of a *G* (Jacob and Jeannerod 2003, p. 8).

The hypothesis about the presence of an agent who detains the property *G* is *abduced* on the basis on one or more *perceptible* properties *F* that usually signify the relevant properties. If an organism is hunted as a prey or avoided as a predator because of a property *G*, it must try to reduce the occurrences of the properties signaling their characteristic, and this varies widely from organism to organism. It is

¹³I will analyze the abductive inferences informing the whole complex of perception in the first part of Chap. 10, dedicated to religious cognition.

inconvenient to hypothesize for a very basic animal mind to have a complex internal representation to deal with a notion such as *agency*, but we can easily postulate that its PPR representations may intend properties that depend on the fact that the apperceived complex of signs *A* is an agent: such as, “*A* can eat me”, “I can eat *A*”, “*A* can thread on me”, “I do not have to worry about *A*”. The actuality of these traits must be abducted by the subject from the series of signs it is able to perceive: they can be visual, kinesthetic, auditory, tactile or olfactive-chemical. What I described as *A*’s affordances are not always straightforward as they rely on perception which is potentially erroneous by itself. Affordances can abductively activate the right behavioral response, but they can fail as well. Everybody has had more or less direct experience with the misperception of an affordance. In those cases, an external sign configuration leads to formulating a poor abduction which usually leads to regrettable consequences: the most painful outcomes are entailed by dealing with false negatives rather than false positives, e.g. flirting with a resisting object of our loving desire, bashing one’s head against a low ceiling, eating a poisonous berry or poking a sleeping crocodile assuming it was dead.

2.2.3 *Pragmatic-Semiotic Models of Camouflage*

At this point, it is legitimate to advance the claim that every agent has a *twofold inferential relevance*, an active and a passive one: on the one hand, it disperses signs *out* in its environment, on the other hand it receives and processes signs *from* other organisms, and former process must be minimized while the latter maximized either to counteract predation or to avoid being spotted by a potential prey. As we will see in the next section, something similar could be said also as far as “machievellian” communicative-pragmatic interplays are at stake: a strategic agents uses her words to deceive others and, at the same time, avoid being deceived herself. So, organisms try to produce signs that fall out of their preys’ and predators’ agency-detection mechanisms, but they can nevertheless be extremely loud with respect to other systems: for instance birds in the rainforest can be colorful and noisy insofar as those signs are not a valuable clue for predators to infer their presence and position and conclude “There is a prey.”

If we assume that organisms are endowed with abductive cognitive systems aimed at the detection and identification of other agents in their surroundings, we can suppose that these systems operate within a determinate threshold selecting semi-encapsulated stimuli which activate the inferential processing. Elements of the *semiosphere* that fall within these abductive thresholds are likely to produce in the organism an internal representation involving some kind of awareness about a particular nearby agent, and subsequently determine its behavior.¹⁴

¹⁴This view can be surely related to the discourse on modularity (Fodor 1983; Barrett and Kurzban 2006; Carruthers 2007), and it would probably be coherent with a postulation of an “agency detection module,” but I would rather not tackle that (formerly?) hotly debated issue if not, again rather marginally, in Part III, Chap. 10.

In order to maximize their chances of not being discovered by agency recognition systems, certain organisms were favored by natural selection into modulating their semiotic footstep and let out signs that can be few and deceiving (falling under the inferential threshold of other agents, so that they do not trigger any positive agency-detection response) or meant to overwhelm and saturate the agent's abductive threshold.

This is the point where we cannot avoid talking about camouflage anymore. According to Stevens and Merilaita (2009), camouflage comprehends "all strategies involved in concealment, including prevention of detection and recognition" (p. 424), and they maintain that camouflage should be analyzed with respect to its *function* and *mechanism*, thereby stressing the relevance of local semiotic and pragmatic interactions: "in defining different forms of camouflage, we use the term 'function' to describe broadly what the adaptation may do (e.g. breaking up form, distracting attention), and the term 'mechanism' to refer to specific perceptual processes (e.g. exploiting edge detection mechanisms, lateral inhibition)" (Stevens and Merilaita 2009, p. 424). As a consequence, most dynamics broadly labeled as camouflage are seemingly aimed at preventing detection, avoiding recognition or averting the opponent from operationalizing a PPR representation (in other words, to prevent the other agent from correctly exploiting the affordances of that particular representation). Let us analyze from within the framework we developed so far some of the most widespread camouflage techniques in the animal kingdom.

Crypsis usually individuates those processes in which the initial attempt is to prevent detection. When we intuitively think of camouflage, we usually think of *crypsis*. In *crypsis*, the semiotic-abductive informational exchange is altered so that an organism attempts to "go stealth" by minimizing the extent to which the signs of its agency contrast against the background environment. To mention a few examples, stonefishes (*Synanceiidae*) shaped their appearance so to be inapparent from the sea bottom, while the famous peppered moth (*Biston betularia*) makes itself virtually invisible to its avian predators by blending, in plain sight, with likens covering birch trees (Majerus et al. 2000). Cryptical tactics are usually confined to one perceptual dimension, as in the case of the Australian frog (*Limnodynastes tasmaniensis*) and its main predators, i.e. snakes (Osorio and Srinivasan 1991): visual *crypsis* can protect the frog as long as it is not detected and recognized from its chemical-olfactory trace. Sharks are another fitting example of *crypsis*: their darker back blends with the background when seen from above, while their clear bottoms are hard to tell from below, as they merge with the clearer shade of water light from the Sun. If we mean to describe *crypsis* in a semiotic, abductive and pragmatic framework, we could say it works by downplaying signs so that they not activate other organisms' agency detectors: those signs do not nudge the cognitive system into reacting and abducting their origin, and therefore do not trigger the production of a PPR representation that could prove lethal for the camouflaged organism, or alert the prey if *crypsis* is enacted by a predator.

Masquerade is a semiotically different kind of camouflage, inasmuch as organisms do not attempt to merge with the background: conversely, they provide into the semiosphere signs that make them easily detectable, but "their bearers are misidentified

as either inedible objects by their predators, or as innocuous objects by their prey:” to make a few examples “plants from the genus *Lithops* look remarkably like stones; stick insects are easily mistaken for the twigs of the branches on which they sit¹⁵; the *Ornithoscatoidea decipiens* spider closely resembles bird-droppings; the leafy sea dragon *Phyllopteryx eques* is often misidentified as seaweed; the Amazon fish *Monocirrhus polycanthus* is visually almost indistinguishable from leaves, and birds from the family *Nyctibiidae* bear an uncanny likeness to tree stumps” (Skelhorn et al. 2010, p. 1).

Other forms of camouflage exist, such as the *kinesthetic camouflage*, which relies on the alteration of a given subpart of the organism’s semiotic shadow: their aim is not to prevent an organism from being detected nor to be recognized, but to prevent an effective prediction of their spacial bearings (Srinivasan and Davey 1995). “Motion camouflage is a strategy whereby an aggressor moves towards a target while appearing stationary to the target except for the inevitable change in perceived size of the aggressor as it approaches” (Glendinning 2004, p. 477).

To sum up, if *crypsis* produces signs that are not configured as cues for possible abductions, *masquerade* tactics offer indeed a profusion of signs likely to be picked up by other agents that are not to be processed as relevant for agency recognition but are instead actively acknowledged as inert objects belonging to the environment. What is at stake is not the possibility of performing abductions upon a configuration (or non-configuration) of signs in the semiosphere, but the quality of such abductive inference, and the reliability of the consequent PPR representation. Similarly, *kinesthetic camouflage* does not aim at impairing an agent’s abducibility as far as its detection or recognition are concerned, but rather compromises the quality of the PPR representation fostered by the agent’s semiotic shadow.

It is important to note, both for our present discourse and for the one I will carry out towards the end of this book in Part III about the origins of supernatural belief,¹⁶ that a certain *counter-factuality* could be ascribed to the kinds of PPR representation (or the lack thereof, i.e. when a predator or prey is not spotted) triggered by camouflage, insofar as they either depict organisms differently from their real nature or they fail to depict them at all, when they are present. Some particular semiotic configurations are selected to overwhelm an organism’s abductive thresholds, so that it is likely to entertain particular kinds of counterfactual internal representations, concerning agents that disappear (after ink-blindness in dark environments, immobility in motion-detecting systems, camouflaged organisms) or strange, fearsome agents which inhere to but do not comply with already known agents. These representations can either appear as menacing predators or as awe-inspiring preys who cannot be overwhelmed. A radically unknown agent can in fact mesmerize or discomfort agents in its proximity.

¹⁵The stick insect, *Phasmatodea*, enriches its structural camouflage by faking a typically *atmospherically-induced* way of moving, shaking and trembling like a small branch moved by gushes of wind (Bedford 1978).

¹⁶Chapter 10.

2.3 Argumentation, Truth and Survival: Human Beings and Linguistic Camouflage

After having delineated a decent inferential model of the main forms of camouflage, I will now focus on those situations to which the concept of camouflage can be extended metaphorically, that is involving no physical perceptual deception, and try to demonstrate how such extension is particularly legitimate inasmuch as exactly the same kind of dynamics, *mutatis mutandis*, can be individuated in argumentative as in biological camouflage.

By achieving “ecological dominance” (Flinn et al. 2005), human beings obtained a progressive increase in safety from natural predators, making the necessity to detect life-threatening animals a more and more obsolete part of their evolutionary endowment. Similarly, it can be reasonably suggested that the diffusion of farming in most populations reduced human beings’ dependance on their predatory skills (and thus on their skills for coping with camouflaging preys). Conversely, increased levels of sociability and civilization established humans as the highest threat for their conspecifics’ survival and welfare, fostering clashes not necessarily involving physical violence but equally dangerous and likely to affect one’s future development, for instance concerning accessibility to feeding resources and sexual mates (Boehm 2012). The dimension permitting this unprecedented level of sociability is of course language. Over the past few decades, scholars have intensively explored the artifactual and externalized dimension of language, and how it provides a scaffolding dimension for human activities (Clark 2005, 2006). As I will abundantly examine in the following part, several studies stressed how the very origin of language can be traced down to its social relevance, as a policing tool aimed at enforcing moral (and proto-moral) norms and coping with free-riders (Dessalles 2000; Dunbar 2004; Ross 2007; Sperber and Mercier 2010).

Today it is widely acknowledged that language—in its various manifestations including arguing—can subtly support violent aggression and oppression (Magnani 2011): the development of language would not make aggression, conflict and fighting disappear but simply moved them to another plane. For instance, Hample and colleagues—discussing the particular case of playful argument—suggested that arguing is closely related to *verbal combat* and *verbal force*. More precisely, they claim that verbal combat is the *base appearance* of arguing (Hample et al. 2010). It follows that the more “civilized” and sophisticated approaches to arguing—i.e. those assuming it as a means for finding a mutually accepted solution, for persuading, or for exchanging valuable information—are basically new avatars of its ancestral form.

As illustrated by Magnani in his recent book “Understanding Violence” (Magnani 2011), the idea that arguing is verbal combat is related to the expression “military intelligence” coined by the French mathematician René Thom. It refers to all those situations in which arguing is deployed to maintain the structure of societies (Thom 1988): that is, language can efficiently transmit *vital* pieces of information about the

fundamental biological oppositions (life–death, good–bad). It is from this perspective that we can clearly see how human language—even at the level of more complicated syntactical expressions—always carries information about moral qualities of persons, things, groups, and events. In this sense, arguing as verbal combat may be considered an indispensable maneuver that serves the purpose of managing the various coalitions and groups that are *facing in the battlefield*. Information warfare is the most visible example, yet not the only one. Indeed, the battlefield that is tacitly projected through verbal combat does not involve fangs, claws and spears anymore. Conversely, such a battlefield is populated by narratives created by the different coalitions that are confronting with each other.¹⁷ People exercise their argumentative skills in both rhetoric and dialectic settings, and they aim at prevailing one over the other or, at least, protecting and preserving their own integrity. Therefore, one of the main functions of arguing and reasoning is eminently social, meaning that it deals with the management of the coalition. That is, persons argue not only because they exclusively aim at finding meaning to understand a thing in its relationship with other things, and thus successfully gain control over the environment: it is clear that person may also start arguing for influencing and manipulating other people’s thoughts and actions (Malle et al. 2001). Managing social interaction seems to be an evolutionarily primitive function of language comparing with more sophisticated ones, as suggested, for instance, by Sperber and Mercier (2010): they support the view according to which reasoning is a social competence, that is, an ability to “convince others and to evaluate arguments others use in order to convince us”.

When the exchange of reasoning aims at persuading or, more generally, managing social interaction, even fallacies become a fundamental part of the toolbox we have at disposal.¹⁸ They are particularly good in one specific respect: following Malle, I suggest that arguments that make us gain control over the environment have to be true, whereas those which help us manage social interaction only have to be *compelling* (Malle et al. 2001). Fallacies are poor at the former task while being much better at the latter. The main reason why fallacies are particularly good at persuading is that they usually enlarge the information base by introducing some (apparent) irrelevancies. For instance, that is what characterizes a specific class of fallacies labeled by traditionally-minded fallacy theorists as *ignoratio elenchi*. Introducing irrelevant information serves two main purposes. First of all, it contributes to manipulating people’s attention by producing a shift in issue: relevance is no longer a logical criterium for evaluating an argument, but the result of a social dynamics in which people continuously strive to prevail one over the other (Dessalles 2000). Secondly, loading a discussion with apparent irrelevancies has a cognitive meaning: enlarging the information base makes it easy for a person to have an opinion even

¹⁷This issue will be crucial in the next part, especially in Chaps. 7 and 8.

¹⁸The use of fallacies will be a crucial topic when analyzing gossip in Chap. 7, refer especially to Sect. 7.5.2.

in presence of patent ignorance about the topic in discussion (Bardone and Magnani 2010; Bardone 2011).¹⁹

We can start by acknowledging that whereas in biological camouflage the aim is to provide an observer with a series of signs that lead into making the wrong inference, communicative camouflage differs inasmuch as it involves the production of semantical and performative acts likely to mislead one's interlocutors, by shielding from intellection their actual beliefs, intentions, etc. In a situation of lack of information and knowledge (constitutive "ignorance") abductive reasoning is usually the best cognitive tool human beings can adopt to relatively quickly reach explanatory, non-explanatory, and instrumental hypotheses/conjectures, exactly as it happens when the cognitive target is to guess the presence of other agents in the environment.²⁰

Setting off from this my contention is that, in argumentative dynamics, *masquerade* seems to be the most easily individuated camouflage analogue. *Crypsis* is not totally absent but concerns rather subtle, subliminal argumentative devices: Shakespeare put indeed in the mouth of a young lover the words "She speaks, yet she says nothing", but while a peppered moth can indeed *go stealth* by blending with the bark, it is hard to conceive how an utterance or a writing can be actually produced, be efficacious at a pragmatic level, and still not be noticed. *Subliminal* communication strategies aim at influencing the receiver's decision-making processes (so to persuade her into acting in a certain way, buying certain products, approving of a certain policy and so on...) by targeting her with an intense fire of signals that stand out from background noise but are "low" enough so that the receiver's consciousness does not engage and evaluate them (Krosnick et al. 1992; Pessiglione et al. 2008). Nevertheless, voluntary subliminal signaling has often been associated with practices akin to hypnosis, or affecting corporate interests, national propaganda and so on, and are less frequently deployed in ordinary communication.²¹

Nevertheless, in ordinary argumentative settings the figure of speech named "*praeteritio*" could indeed be identified as a particular kind of *crypsis*. Such figure—already described in the *Rhetorica ad Herennium*—involves a speaker stating her intention not to mention something, but by this she *precisely* refers to what she said she would not say (Snoeck Henkemans 2009): for a brutally simple example think of something along the lines of "I do not want to remind you of about the indecent behavior you held at the party." *Praeteritio* is thus a way to push and "smuggle" contentions towards the other speaker without her being able to openly rebate. If a semantic camouflage is harder to achieve with *praeteritio* (that is, it does not affect

¹⁹I will discuss a similar point in the next Part, Chap. 6: specifically, I will analyze how the knowledge-richness of a given environment affects the attitude one should adopt towards different regimes of rationality, for instance fallacies and what is commonly, but also academically (sic!) known as *bullshit* (Frankfurt 2005).

²⁰Gabbay and Woods (2005), Magnani (2013), Woods (2013) recently dealt with the connotation of abductive reasoning as "ignorance-preserving," to which I will resort several times along this book.

²¹Here, I am not addressing the whole range of subliminal *conversation* where signals are subliminally—involuntarily—produced and not only received, as far as pheromones, body language or even lapsuses for instance are concerned.

the *meaning* of the words), it is easier to push through the performative one effect, as the speaker affirms she is *not* going to perform the speech act that she immediately performs, leaving it in a kind of suspended state. A skilled use of *praeteritio*, such as “I am not saying that the Pope is ignorant, I am saying the Pope *knows nothing about Islam*” can strategically maneuver the discourse frame by (deceitfully) insinuating a series of assumptions which become “invisible” (inasmuch as undeclared) constraints for the other speaker. Resorting to Thom’s aforementioned notion of “military intelligence”, *praeteritio* allows an arguer to stealthily introduce in the battlefield a number of strategic or offensive pawns on which either she can rely to reinforce her position against the opponent or that can directly fire against the opponent’s position: by use of this figure of speech those pawns are indeed deceitfully disguised in order to deflect recognition and most of all proper engagement.

Moving on to the broader family of rhetorical devices defined as “fallacies”, it seems proper to say that truth is frequently distorted by means of *argumentative masquerade*. As a matter of fact, most of informal fallacies are usually labelled as *red herrings*, stressing their fundamental utility as attention traps, aimed at diverting the interlocutor’s attention from the matter at stake onto something else: many of these can be labeled “gossiping fallacies,” considering their crucial role in many socially-oriented linguistic exchanges (Bardone and Magnani 2010). For the sake of our argumentation, it is curious to reflect on the origins of the label: a “red herring” was tied to the tail of captive foxes that were then released in a field to the scope of training fox hounds in following smell tracks in open country. Common sense seems to be powerfully aware of how the discourse on biological and argumentative camouflage is perfectly interchangeable, and such awareness is witnessed by the continuous etymological borrowing between the two fields.

I maintain that various kinds of appeals to emotion reenact the dynamics of masquerade, and in these cases it is much easier to spot the analogies. Consider the *ad baculum* fallacy, also known as “appeal to force,” by which an arguer is invited to accept or reject a claim chiefly because of some kind of threat, or the appeal to consequences (*argumentum ad consequentiam*) by which the likelihood that a claim is true is linked to its consequences or the consequences of its acceptance: the biological analogue is the *masquerade* technique involving the display of false eyespots or the unexpected (and thus frightening) modification of physical features, offering false affordances to the observer who subsequently activates a behavioral response which is likely to negatively impact its welfare or survival possibility.²² Similarly, the *ad verecundiam* and other “appeals to authority” provide a series of semantical signs aimed at tampering with the quality of the abduction the interlocutor should make concerning what is relevant in the discourse. In all of these cases, the argument can be more or less skillfully “wrapped” so that the receiver processes it and abductively evaluates it by making use of appraisal systems that are not relevant with respect to what is at stake. Analogously to masquerade, the argument (like the camouflaging

²² Blowfishes, ink-shedding cephalopods such as cuttlefishes, squids and octopi, frill-necked lizards are all masers of *ad baculum* and *ad ignorantiam* equivalents in the animal kingdom.

organism) is in plain sight, the arguer does not try to dissimulate it, but presents it as *something else* from what she actually knows is the case!

The fallacy known as “straw man” is also very fitting to explore the analogy between argumentative devices and biological masquerade systems: the *construction* of a straw man which grotesquely (or inaccurately) represents the opponent’s position is strongly connected to the devising of a configuration of external signs aimed at puzzling and deceiving other agents. What results is that the interlocutor of the fallacious reasoner is trapped in a biased perspective, which she might transpose into other argumentative settings thus becoming intrinsically biased herself. The interesting point in the comparison between “straw man” fallacies and masquerade technique is that whereas masquerade can be usually reduced down to a strategic engagement between a predator and a prey, the straw man has such a strongly rhetorical-argumentative connotation that it structures environmental engagements among several actors, involving the arguers and a third party assessing the discussion. The rhetorical device allows *arguer A* to camouflage not her own semantic production but that of *arguer B*. The altered semantic shadow (i.e. the straw man, the caricatural production of the arguer) is directed towards the third party: they can use it, combined with their knowledge base, to abductively infer a *character B** which does not coincide with that of *arguer B*. It can be said that *arguer A*—resorting to the straw man—works like an *argumentative prism*, breaking down her interlocutor’s argument and then providing a decomposed and deformed version of it to some other party. Biologically, it can be compared to parasitic techniques such as the Old World cuckoo’s, which lays the egg in the nest of another bird so that the fledgling cuckoo is nurtured by its “foster parents” and outcompetes its step-sisters and brothers, curbing both the welfare and the fitness of the nest it parasites upon.

Of course, as already highlighted the conception of *truth* intended by biological and argumentative camouflage is, at least *prima facie*, not the same: whereas a “good” behavioral response in a biological framework means the animal was able to survive (and reproduce), debunking a fallacious argument has instead to do with the assessment of whether what is being uttered *corresponds* to a state of things in the world. Two different conceptions of fitness²³ can be at stake here as well: a pragmatic conception of truth, related to survival, echoes an idea of fitness embodying one’s possibility to have descendants, whereas in argumentative settings the failure to appreciate truth in the argumentation of one’s interlocutor usually does not impair her possibility to give birth to a progeny, but rather her overall welfare.

At this point, it seems legitimate to resort to the same definitions I had use to describe the dynamics of biological camouflage: *some argumentative devices do make use of strategies aimed at by-passing the threshold of abductive appraisal of a claim; on the other hand some other devices are structured so to overwhelm the appraisal threshold and have the claim processed by an irrelevant system* (i.e. emotional rather than rational and so on).

²³Here again *fitness* should not be intended in a strict Darwinian connotation: but rather be considered as a local trait, relating to the survival and the welfare of the single individual, without long-term evolutionary implications.

2.4 Biological and Argumentative Camouflage are Debunked by Similar Methods

The next step I mean to take is to demonstrate how the strength of the analogy between the natural and the argumentative framework can be further explored by individuating and analyzing some of the possible counteracting strategies against biological camouflage, and showing how they can be enacted in the argumentative framework as well.

Our hunting ancestors knew that preys (and potentially dangerous animals as well) were hiding in the bushes, even if their presence was not evident at a first glance. The target was to acquire and operationalize an un-biased perspective on the environment, that is, of the potential preys to be hunted and predators which might threaten the hunters. That is to say, as far as camouflaging biological organisms' are concerned, hunting could be considered as the first systematic attempt to go beyond Nature's appearance—an outlook on things that would be assumed by philosophy after almost 200,000 years, and that would inform modern science more than twenty centuries after the birth of philosophy!

It is a fact that hunting strategies became more and more sophisticated, and they were reflected by an always stricter dependance on the artifactual apparatus (Bingham 2000). Such development structured hunting as part of the cognitive niche, an externalization of knowledge onto the environment able to modify some of the natural selection pressure present in their local selective environments, as well as in the selective environments of other organisms.²⁴ It could be speculatively suggested that hunting structures a cognitive niche also according to the definition of cognitive niche as a "set of affordances" (Gibson 1979; Magnani 2009): camouflage turns down many of an organism's ecological and practical affordances in order to avoid detection, recognition and the subsequent pragmatical effects. Hunting applies onto the environment a series of affordances counteracting the disruption operated by camouflaging animals.²⁵

Most human hunting practices could be considered within the inferential-abductive warfare dynamics that were put forward in the first part of this chapter. Recapitulating, I showed that *camouflage and other techniques meant to avoid detection and recognition operate either by overwhelming or by not meeting the agency recognition mechanism's abductive threshold*. We also just briefly reviewed the fact that "man the hunter", thanks to the development of consciousness and intentionality, could actively provide its agency detection systems with cues that would have

²⁴Most of the following Part will be devoted to cognitive niche construction and maintenance, this definition is therefore just a stub for the sake of present discourse.

²⁵Cognitive science, evolutionary psychology and paleoanthropology have thoroughly studied the pivotal role played by hunting in the development of many contemporary human endowments. Epistemologist Giuseppe Longo puts forward a fascinating hypothesis linking the development of an abstract concepts such as Euclides' *line without thickness* to the rapid eye movements from one point to the other (saccade) by which a hunter precedes the trajectory of the prey in order to capture it (Longo 2005).

otherwise been overlooked. Considered within this perspective, the following excerpt by C S. Peirce might be particularly illuminating: “[...] A mass of facts is before us. We go through them. We examine them. We find them a confused snarl, an impenetrable jungle. We are unable to hold them in our minds. [...] But suddenly, while we are poring over our digest of the facts and are endeavoring to set them into order, it occurs to us that if we were to *assume something to be true that we do not know to be true, these facts would arrange themselves luminously*. That is abduction [...]”.²⁶

Peirce’s description of abduction, with all of its natural strength and the sense of *being alive* it conveys, fundamentally informs how abductive warfare can be counteracted so that the detecting agent can individuate the camouflaged one: is it possible to spot a similarity between what happens in biological context and in an argumentative one? Relying on Peirce’s intuition, I will make it clear in the following subsections.

In order to tackle the matter at stake, it is necessary to introduce the reader to an incredibly useful notion, that is Egon Brunswik’s “lens model.” The *lens model* (Brunswik 1952; Hammond and Steward 2001) is based on the idea that the relationship between the organism and the environment is mediated by the use of the so-called *proximal stimuli*, from which the organism can infer the *distal* state of the environment, which brought it about. *Ecological validity* is the term introduced by Brunswik to refer to the situation in which a given proximal stimulus acts as a valuable indicator of a certain distal state or event; ecological validity is a normative measure about how diagnostic—reliable—certain proximal stimuli are with respect to a given distal event (Vicente 2003; Kirlik and Storkerson 2010). By referring to Brunswik’s *lens model*, it could be argued that the debunking of camouflage involves a manipulation of proximal stimuli by the observer, aiming at the reconstruction of the distal event to which proximal stimuli lead.

Thus, employing the lens model lexicon, we can say that agents must assess the traces available in their environment in order to maximize their *ecological validity*. We can correlate the notion of ecological validity to the possibility and the quality of abductive inferences concerning the presence of hidden organisms (as far as biological camouflage is concerned) or the truthfulness and trustworthiness of one interlocutor’s claim (in case of argumentative camouflage). Since camouflage aims at tampering with abductive mechanisms allowing for the detection of external organisms, or the appraisal of claims made by one’s interlocutor, it can be proposed that strategies to counteract camouflage rely on the improvement of the starting set of cues from which the abductive inference sets off. This manipulation can happen both internally and externally, and can be briefly modeled as follows: in order to disrupt a camouflage pattern, a cognitive agent introduces a belief to be used as a lever to see if her perceptual impression holds or breaks by assuming—in Peirce’s words—as true something she does not know to be true and witness the possible reconfiguration of the perceptual-argumentative experience.

²⁶Italics not in the original. cf. Peirce’s “Pragmatism as the logic of abduction”, in Peirce (1992–1998), pp. 227–241, the quotation is from footnote 12, pp. 531–532.

2.4.1 Countermeasures for Animal Camouflage

Let us consider biological camouflage first, and apply Peirce's description of abduction mentioned above: if *crypsis* works indeed by downplaying signs so that they do not alert agency recognition mechanisms, the abductive counteraction may consist in the assumption of a certain cue to be *more relevant* than it seems to be in the configuration which actually impacts the receiving perceptual system. An example could be to consider a particular spot as if it was an *eye*: assuming such a detail as true might afford the reconfiguration of the visual perception so that the rest of cues become *then* meaningful signs of the presence of an agent (this corresponds to Peirce's "but if *A* was true, then *C* would be matter of fact"). Furthermore, if this additional hypothesis proves to be meaningful, a cascade of positive inferences may follow: i.e. once the eye of the organism is located, the observer can detect the face, which leads to the appearance of the body, the legs etc.

Masquerade dynamics, meant to impair the detector's abductive ability to recognize and identify an agent (rather than preventing it from being individuated *tout court*), can be disrupted in a similar way: by assuming something to be different from its perceptual appearance and letting this assumption redefine the way in which the semiotic configuration is perceived by our senses.

Also by intervening about what is the origin of perceptual judgements, it is sometimes possible to break down a camouflage attempt by triggering the manifestation of the distal event: kinesthetic perceptions and physical manipulation are possible methods. Kinesthetic perceptions relate to the enriched perceptual imagery offered to an observer who moves in the environment so to change her point of view and match the different aspects she perceives at different stages.²⁷ The other kind of environmental manipulation (sometimes complimentary to other types of investigations) involves active manipulation—probing—of the environment. Such practices can consist in approaching the potential camouflaging organism in order to trigger a reaction of some kind, or, in a more artifactual dimension, the use of fire and smoke to reveal the presence of animals hiding in trees, caves etc. Such practices clearly demonstrate how the debunking of camouflage can also rely on

²⁷Phenomenology's toolbox includes the pivotal concept of *adumbration* (Husserl 1960, §17), referring to how only one partial aspect of an objects is manifest to the observer at one time, and this single aspect *foreshadows* the rest of the thing by an interplay of hinting and hiding. Such a concept is interesting for the philosophical investigation of camouflage inasmuch as to spell out a camouflage instance could also mean to look for the most relevant possible adumbration, and this is achieved also by the kinesthetic control of perception. The kinesthetic control of perception is related to the problem of generating the objective notion of three-dimensional space, that is, to the phenomenological constitution of a thing as a single body unified through the multiplicity of its appearances (Husserl 1960, §44). The "meaning identity" of a thing is of course related to the continuous flow of adumbrations: given the fact that the incompleteness of adumbrations implies their synthetic consideration in a temporal way, the synthesis in this case—kinetic—involves eyes, body, and objects. This kinesthetic synthesis of adumbrations increases the inferential knowledge-base on which agents can perform abductions concerning possible camouflaged agents, by noticing for instance parts of the—initially—irrelevant background that are mismatching, moving or unexpected in other ways.

abductive manipulations consisting in “discovering through doing”,²⁸ which are energy-consuming but effective when the inferential knowledge base concerning potential camouflaging organisms is poor and difficult to improve.

2.4.2 Countermeasures for Verbal Camouflage

So far we explored the modeling of heuristics meant to contrast biological camouflage. What about linguistic camouflage? My contention is that coping with occurrences of camouflage in argumentative settings can rely on the same *lever model* that seemed the most plausible for dealing with biological camouflage. Since linguistic camouflage downplays the possibility and quality of abductive appraisals concerning particular claims (or clusters of claims), the aim of counteracting strategies is to assess and improve the ecological validity of single pieces of information and so to *verify or reshape the distal event* (for instance the interlocutor’s true intentions etc.).

Received information is appraised by matching it with either *context-dependent* or *context-independent* beliefs that were already acquired by the agent, in order to improve the possibility of managing successful abductive inferences. Context-independent beliefs are thought of as true in every situation (apart from playful occurrences, jokes etc.), and concern the way one expects a discussion to be carried out (think for instance of Grice’s conversational implicatures (Grice 1975)), and inform the kinds of (context-dependent) checks one agent should perform upon the received information in order to spell out arguments attempting at camouflaging or biasing truth. The main context-independent beliefs used to scan arguments usually resemble to “Arguments and claims should be coherent” and “Information provided should be relevant with respect to the context.” It is possible to use context-independent beliefs as levers to test whether the structure holds or not, or to perform some checks upon the interlocutor’s single claims in order to understand whether her utterances correspond to how things are.²⁹

As far as relevance is concerned, checks are usually aimed at scanning for fallacies. Fallacies—as already suggested—present the claim and sometimes make it effective by coating it with irrelevant information. If the option is pragmatically viable,³⁰ the receiver of the fallacious claim analyzes it expanding the inferential knowledge base resorting to the belief that “Information should be relevant with respect to the context.” If the information provided only apparently complies with this belief, the camouflage attempt is debunked and rebutted. The gradient of irrelevant information

²⁸On cognitive processes relating to manipulative abduction and “discovery through doing” (see Magnani 2001, 2009). I will also take advantage of this notion in the next part, specifically in Chap. 4.

²⁹I will analyze the role of repeated experimentation as a manipulative way to conquer true beliefs in the final chapter of this Part, when dealing with a new framework to understand experimentation (Chap. 4).

³⁰As suggested by Herbert Simon, human beings have to cope with limited mental processing capabilities taking place in limited temporal settings (Simon 1955).

affecting the exchange is not necessarily an indicator of malicious intentions, but might depend on a lack of competence on either one or both poles of the dialogue. In such cases, the abductive appraisal of the interlocutor's claim becomes harder because of the systematic and often purposeless use of fallacies.

Consider that fallacies, even if they do not rely on context-dependent information, can lead us to solve the task we are supposed to face. Paradoxically, and yet enforcing this analysis of camouflage (both biological and argumentative) as abductive warfare, it can be claimed that *the very strategies aimed at debunking camouflaged fallacies are fallacious themselves*, inasmuch as an abductive appraisal involves, according to Peirce, to assume as true and relevant something we do not know to be true: abduction, it is worth reminding, is a formally fallacious argument and therefore non truth-preserving. True premises will not necessarily lead the reasoner to a true conclusion. In the sentential perspective of classical logic, abduction is classified as the fallacy of affirming the consequent. In abductive reasoning, this kind of appraisal is linked to evaluating various inferred explanatory, non-explanatory, and instrumental hypotheses/reasons, and, of course, it varies depending on the concrete cognitive and/or epistemological situation.

If an agent relies on relevant information as if it was an abductive lever, it is usually quite easy to debunk and rebut a claim that was camouflaged by means of fallacies. From a theoretical point of view, fallacies are therefore a rather weak system of argumentative camouflage: nevertheless, they remain an extremely widespread tool available to the vast majority of arguers. Indeed, time and computational resources to perform the disrupting strategies I just described might not always be available, while there's always time to commit a quick and effective fallacy. This factor makes fallacies a cheap-and-fast camouflage method whose potential benefits (for the fallacious arguer) are far higher than its costs.³¹

Checks on the relevance of an interlocutor's claim still correspond to a manipulation of *proximal* stimuli (this time linguistic) to produce a higher quality inferential base to make the distal phenomenon appear clearly, or at least better abducible. Exploring the relevance of a piece of information helps assessing its ecological validity and whether it leads to a positive or negative appraisal of the claim it relates to. A check on proximal stimuli may affect the perception of the distal event also when stimuli are compared one to the other (and not taken as isolated pieces of information) in order to assess their coherence. A correct appraisal of the coherence of an argument deeply affects the quality of an inferential knowledge base and the quality of the abductions one can operate upon it. As a matter of fact, the belief "Arguments and claims should be coherent" is another important context-independent rule that interlocutors are expected to observe. It is therefore possible to try and lure an interlocutor into the acceptance of a claim only apparently coherent.

³¹I will analyze the environmental deployment of fallacious (and sometimes careless) knowledge into one's epistemic environment in Part II, Chap. 6. It is already possible to argue, though, that phenomena such as *bullshitting* might be analogous to engaging in meaningless linguistic camouflage efforts.

As far as coherence is concerned, a strategy to break argumentative camouflage may consist in the analysis of whether the various claims put forward by one's arguer display a truly explanatory coherence or merely an *emotional* one.³² Emotionally coherent arguments might in fact be put forward instead of *explanatorily* coherent ones, so to push the receiver into accepting their claims more easily. Explanatory coherence and emotional coherence neither mutually imply nor mutually exclude each other. An explanatorily coherent argument might or might not be emotionally coherent, and vice versa. It must be noted that systematic failures in appreciating the difference between explanations that are explanatorily coherent vs. emotionally coherent might drag the whole system down to a state of *terminator niche*, where modifications meant to improve the total welfare of the system are indeed the prime causes for its ruin (see Part II, Chap. 9).

By assessing the argument's explanatory coherence, the receiver does in fact improve the possibility to make a correct abductive appraisal of the distal event (e.g. the speaker's true beliefs, intentions, etc.), and avoid the possibility of being entangled in a web of emotionally self-assessing beliefs.³³

To provide an argument with many appeals to emotional coherence is a widespread technique which informs yet another kind of "masquerade," inviting one's interlocutor to make the wrong inference based on an ambiguous semantic configuration. To enact countermeasures, for instance by checking whether a piece of information that the receiver already holds can be used to successfully deepen the explanation brought forward (or if a new belief can be obtained to this scope) is not always a viable strategy, especially if the topic at stake is emotionally dear to the interlocutor himself (Thagard 2007). As a matter of fact, recent results from neuroscience seem to corroborate the thesis considering the importance of emotional

³²According to Paul Thagard, from an epistemological outlook we should prefer beliefs displaying a greater explanatory coherence, that is connecting in a deep and consilient way. A computational algorithm can be easily programmed to select explanations with the highest explanatory coherence, nevertheless human cognitive behavior can be better approximated making use of an algorithm which also takes into consideration emotional coherence: "according to the theory of emotional coherence, inferences about what to do and believe are affected not only by hypotheses and evidence, but also by the emotional values that are attached to representations whose coherence is assessed" (Thagard 2005, p. 62).

³³The analysis of this issue could be widened resorting to the concept of *epistemic bubble* (Woods 2005), that I will elaborate in the Part III (Chap. 12). To introduce the matter very briefly, let us remember that there is no causal correlation between explanatory and emotional coherence: therefore, there is no guarantee that an emotionally coherent argument will be explanatorily consistent as well, and vice versa an explanatorily coherent argument might not spark any particular emotional preference. It is also true that particular mechanisms affect the attainment of truth: "truth is a fugitive property. That is, one can never attain it without thinking that one has done so; but thinking that one has attained it is not attaining it" (Woods 2005, p. 746). Therefore an emotionally coherent claim, camouflaged as an explanatorily coherent one, can easily trigger the receiver's acceptance and thus entrap her in an epistemic bubble. Once in an epistemic bubble, the agent is unable to commend her real knowledge from her ignorance concerning the subject at stake (that is, she cannot tell her *knowing P* from her *thinking that she knows P*, inasmuch as her emotional-abductive appraisal is satisfied by the argument, and she is consequently unable to effectively revise her beliefs concerning that topic.

coherence: a whole area of cerebral activation seems dedicated to whether one has to take an argument “personally” or not (Schwartz and Gladding 2011). Such systems can be easily hijacked by argumentative camouflage so to make an interlocutor react in a particular way to certain arguments. This kind of device is frequently used in political rhetorics, advertisement, etc.: Slade (2002) maintains that advertisement works inasmuch as they are not directed at a merely concupiscent cognition but rather present themselves as “rational” and thus compel us into behaving in ways that are, at least *prima facie* in our own judgement, rational.

A provocative comment should conclude this excursus from biology to argumentation, lest we idealize human beings for achieving a sublimation of conflict and predation by shifting all clashes onto the inferential-epistemic level: most of the countermeasures I analyzed so far involve the weapons of abductive-inferential warfare, that is a selective inferential manipulation of proximal stimuli, but it should not be forgotten that such checks might not concern only pieces of knowledge but knowledge-carriers as well, human beings’ possessions, their psyches and their bodies. Just as biological camouflage can be challenged with brute force attacks such as random physical probings or making use of smoke, fire, etc., *similarly* human beings have always displayed a peculiar taste for performing brute-force checks on knowledge carriers (i.e. human beings—human bodies) by means of threat, aggression and torture (Magnani 2011). Notwithstanding the debates concerning their moral legitimacy and their actual usefulness (dating back to the 18th century and still ongoing), these practices seem to prove, with a certain bitter irony, the fundamental continuum between biological and argumentative camouflage.

2.5 Conclusion

The aim of this chapter was to explore and compare camouflage strategies belonging to different frameworks, but whose common goal consists in a struggle to make things appear as different from how they are “in truth.” Truth, naïvely conceived as what is the case in a local environment, can be camouflaged by different means, but all of those means could be modeled considering the interplay between the camouflaging object and the target of camouflage, that is the potential detector.

The concept of abduction, as received from the Peircean tradition, proved to be the best explanatory tool to analyze the inferential ground that underdetermines camouflage: it even explains the continuity of inferential interplays, from those characterizing natural predation to the ones typical of human forms such as arguments, claims and dialogues. Focusing our epistemological outlook on data provided by the tradition of natural studies, I sketched out models of “military intelligence” at play in biological camouflage: organisms aim at tampering with each others’ instinctual agency recognition mechanisms. As a result, they are prevented from correctly detecting and identifying the presence of other organisms in the surroundings. At this point I could move the enquiry one step further, and consider some occurrences of strategic communicative behavior among human beings: was it possible to characterize them

as camouflage as well? Many human activities such as fallacious argumentation seem in fact to tamper with the detector-detecting inferential mechanisms just as much as natural camouflage does: following this idea, it was actually possible to apply the same abductive models to both natural and argumentative camouflage, thus proving the legitimacy of extending the concept of camouflage to frameworks other than biology in a non-metaphorical way. The final point consisted in showing how countermeasures against both kinds of camouflage could be described using the same models: strategies aiming at debunking camouflage involve internal or external manipulations that are used as levers to appraise the ultimate validity of the received perceptual imagery, or of the claim put forward by one's interlocutor. The fertility of this approach does not reside in its being yet another consilience theory, showing homologies between different settings, but rather in the possibility of augmenting our understanding of both natural and human strategic dynamics, using one conceptual framework to foster new reflections about the other.

The next chapter will start from the same "naturalistic" framework, as I will shift my focus from a specific kind of mental representation (the one about agency, analyzed at the beginning of this chapter), to something broader that is the nature of mental modeling. That is to say, I will frame the contemporary debate about scientific models in the naturalistic one about the *emergence* of models as *mental models* at play in biological processes.³⁴

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³⁴Transposed in a different philosophical outlook, the debate about the strategic use of camouflage is strictly connected with the construction of cognitive niches (Part II), and the selection of ecological chances. As camouflage is about either hiding real chances/affordances, or simulating non existent ones, some interesting connections can be drawn between linguistic camouflage and what is commonly referred to as "bullshit" (cf. Sect. 6.2.1).

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