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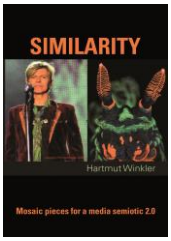

14 Media, Form, and Formalization

1. Intro

I would now like to turn to the concept of *form*, which has already been mentioned several times during my argument and which, to put it bluntly, I consider to be constitutive for the understanding of media.[1] The term itself can be found in the most diverse areas of media: One speaks of aesthetic form and of in-formation, of formats and of formalism; and when I have written about *schema formation*, this term obviously also uses the idea of 'form.'

Above all, however, 'form' is important in the field of information technology, i.e. computers. Formal languages, such as mathematics or the artificial languages of computers, are usually defined as being independent of the world and experience, as a construct or as a 'construction.' It is assumed that they – based on freely defined axioms – only follow their own rules. And this has a direct effect on the concept of form: because formal languages are, by definition, 'formal' precisely to the extent that they are distanced from the world.

'Form' thus takes on a special meaning in the sphere of computers, and while similarity has played a major role in the above chapters, we now seem as far removed from it as possible. Similarity appears to be bound to the senses and experience, worldly, 'dirty' and 'soft,' formalization appears as 'pure' and as 'hard.' But what if this is not right? An ideological idea that formal languages use to deceive their audience? What if the 'dirty' similarity extends into the 'pure' formal sphere? How would the concept of 'form' change? And how (in reverse) the concept of similarity?

I would like to hypothesize that everything we call 'form' is a certain kind of similarity. Of course, this cannot be an immediate sensory similarity (if there is such a thing), but perhaps a 'non-sensory' similarity is an option. There may be a way to understand what a non-sensory similarity could be. And also, once again, there may be another approach to mimesis, which I largely exclude from my considerations, but which a book that bears similarity on its cover cannot completely ignore.

And I have a second hypothesis. I am of the opinion that it is possible *to define form as a similarity extracted from things*. What is meant by this is to be shown; but first I would like to demonstrate how 'form' and formalization in the discourse on computers and media are usually understood.

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[1] I presented parts of this chapter at the conference 'The shape that matters – Form als medientheoretischer Grundbegriff' [Form/shape as a media-theoretical concept] (Univ. of Siegen 2008); the introduction has been changed for the translation.

2. Purity of Form

Formalization is usually described as being directed against any notion of representation, as a free logical-combinatorial game that – independent of the concrete contexts of the world – follows only its own rules. I have described this in more detail in my book 'Diskursökonomie' [Economy of Discourse];[2] and there I mainly referred to Bettina Heintz's account of the history of science.

> "The formalist view of mathematics," writes Heintz, "stands for mathematical modernity. [...] In formalism, the signs have become 'self-sufficient,' they no longer have a reference function, no meaning, and the mathematician who operates with them is in principle free in their setting. In formalist mathematics, there is no longer any reference to anything outside the mathematical system, be it perception, evidence, sensory experience, or intuition. Mathematics itself generates the objects with which it operates and the rules according to which it proceeds."[3]

Heintz outlines a development: While traditional sign systems are bound to representation, reference, and mimesis, formal languages have left this terrain. In formal languages, the signs have become 'self-sufficient.' And the abandonment of representation, reference, and mimesis leads directly to the confidence that it is now mathematics itself that "generates" the objects with which it operates. 'Form' here is *design*, construction, or 'Vor-ahmung,' as Flusser puts it in order to make clear the break with any mimetic tradition.[4] The reservation against mimesis and the notion of generation/construction are closely related.

The second property that characterizes formal languages is the freedom from internal contradictions. Formal languages are built in such a way that they exclude contradictions by definition, and they ensure this at the level of individual programs, for example, by means of test algorithms. This is fundamentally different in the case of 'natural' language: It certainly allows for internal contradictions and makes them thinkable and manageable with the means of language itself. The admission of contradictions means that natural language opens itself up; it always acknowledges that it is in a certain sense unfinished, that it will never fully grasp its object(s), that the concept and the phenomenon which is to be grasped do not coincide; and it is only this difference that makes a reference to the world possible at all.

Formal languages can only guarantee freedom from contradiction if they form a universe that tends to be closed;[5] and this universe can only be closed if it isolates itself from the context. This sense of closure thus also supports the idea that formal languages are reference-less, 'self-sufficient,' or freely 'constructed' systems. And even though Heintz wrote her text thirty years ago and she herself is ultimately critical of the image of formal languages outlined in this way, it can be said that the overall picture is still mainstream today.

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[2] W., H.: Diskursökonomie. Versuch über die innere Ökonomie der Medien. Frankfurt am Main: Suhrkamp 2004, pp. 147-169; the German text is available online:
https://homepages.uni-paderborn.de/winkler/Winkler--Diskursökonomie.pdf.

[3] Heintz, Bettina: Die Herrschaft der Regel. Zur Grundlagengeschichte des Computers. Frankfurt am Main/NY: Campus 1993, p. 16 (transl. H. W.).

[4] Flusser plays with words here: The German term 'Nachahmung' means imitation, mimesis, or *re*-production; Flusser's neologism 'Vorahmung' accordingly connotes an anticipation, a production directed towards the future. "[The digital] images will detach themselves from their imitative, mimetic function and become inventive and poetic." (Flusser, Vilém: Does Writing Have a Future? Minneapolis/London: Univ. of Minnesota Press 2011, p. 71 (add. H. W.), see also: p. 150).

[5] The rapid historical development of mathematics shows that its universe is by no means simply 'closed'; however, the criterion of freedom from internal contradictions also applies here...

To understand the constellation in its entirety, however, something else is important. One has to realize that – in parallel to the development of formal languages – the established ideas of representation, reference, and mimesis have been harshly criticized in philosophy, in the humanities, and in cultural studies. I have briefly outlined this above: The post-structuralists, following Nietzsche's critique of language and with good theoretical reasons, have fundamentally questioned the ability of symbolic systems to understand the world. The 'linguistic turn' (the thesis that our access to the world is mediated by symbolic systems) and the insight that symbols first relate to other symbols and only then relate to the world, the insight that languages are dependent on social processes, that they are by no means 'transparent' and are therefore very unreliable mediators – all of this had to feed the doubts of a philosophy that, above all, understood itself as *critical of signs*.

This seemed to fit in well with the emergence of computers and with the idea that formal languages refrain from claiming a reference to the world from the outset; and also with the phantasy of a 'construction.' It is striking that the critique of signs has largely omitted formal languages – until Latour, for example, made the proceedings of the natural sciences the subject of a similarly radical questioning.

3. Relation to Other Media

Roughly speaking, this is the concept of form as it determines the discourse on formal languages and, in one way or another, their everyday understanding. If we want to counter this with an alternative, it seems to me that this is possible from a *media-comparative* perspective. Because 'form' is not a privilege of formal languages alone. Rather, the term is used in relation to almost all individual media; as a basic category of aesthetics, it operates across media, in the space that separates media and connects them.

What is irritating, however, is that the concept of form takes on different colorations depending on the medium in question. The problem of form in art is different from that in the case of computers; the notion of form in formalist film theory is by no means limited to its tension with 'content;' and Heider/Luhmann have set us further tasks, not to say puzzles, with their medium/form thesis. I will skip these problems by first picking out just one single aspect from all these issues, namely the element of abstraction. If this can be justified, then it is because abstraction is central to the understanding of formal languages but is also effective in all other media. The question of form cannot be separated from the question of abstraction.

As a kind of preliminary contribution to the overall problem, I therefore propose to ask about the specific types of abstraction and formalization in different media, because media differ drastically also in their modes of abstraction.

4. For Example: The Office

The fact that there is a connection between these at all, that a concept of formalization can be conceived across media, has been shown particularly vividly by Hartmut Böhme, albeit initially only using a single example and in a rather marginal consideration that has the office, abstraction, and bureaucratization as its subject.[6] So we must first take a leap into the concrete.

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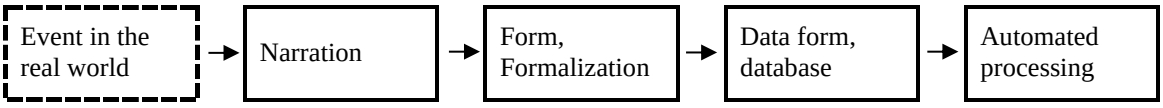
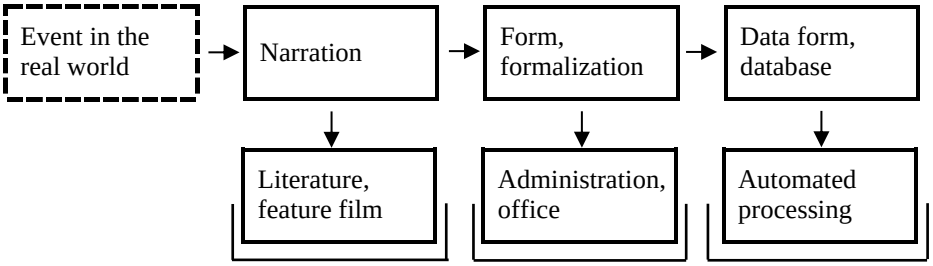
[6] Böhme, Hartmut: Das Büro als Welt ‑ Die Welt im Büro. In: Lachmayer, Herbert; Louis, Eleonora (eds.): Work & Culture. Büro. Inszenierung von Arbeit. Klagenfurt 1998, pp. 95-103.

Böhme notes that an incident, in order to become an administrative process, must go through certain stages of formalization. Take, for example, the processing of an insurance claim: an event occurs in the real world; this is – secondly – converted into a linguistic/symbolic representation, through the narrative of the customer; the task of the staff – thirdly – is to record this narrative on a paper form or a screen mask; a translation that enables the bureaucracy to process the case in the first place, and that finally – fourthly – paves the way for automated processing of the data. Böhme's thesis can be summarized as follows:



This consideration is so interesting because one can conclude that 'narrative media' such as literature or the feature film simply settle for a lower level of formalization:



It can also be concluded that formalization obviously has its own rules, gradation, and limits. Not everything that the insurance customer says about the event will be included in the form or interest the insurance company in the first place. And not everything that can be written on a form can be processed automatically. *So at every stage there will be a gain in form and a loss in 'content.'* And finally, there will be problems that completely resist formalization.

5. Stages and Types of Abstraction

If we accept this for the moment, it becomes possible to categorize media more generally according to the type of abstraction to which they subject their material. To this end, I would like to propose a sequence of stages that begins with the concrete individual case (bottom left) and then, via example and allegory (which are already types of generalization in that they focus on a single case but at the same time demand that the recipients transfer it to other similar cases), progresses to the *concept* by moving further and further away from the concrete and through increasing abstraction.

Level of abstraction	Type of abstraction					
high ↑	structural abstraction ↑		Abacus	Numbers, mathematics	Laws of nature	Formal languages
		Calendar-bones	Tokens (Meso-potamian counting device)			
	conceptual ↑	Language			Humanities	
	allegorical ↑	Myths, religious systems	allegoric sculpture (‘Justitia’)		hidden allegoric strategies in the mass media	
	exemplary			Literature	Magazine, star system	Television
↓	↑				Photography, feature film	
low	individual case, concretion					
		Media history →				

Formal languages surpass the conceptual abstraction of natural language. They are more abstract – not to say more formal – than the concepts, further removed from any ‘content’ that natural language still implies as ‘semantics.’ It is this abstraction that leads to the specific impression – the specific illusion? – of their ‘purity.’

At the same time, however, the perspective has changed fundamentally. As soon as the concepts of language are also regarded as a type of abstraction and formalization, formal languages are released from their isolation; it makes little sense to continue to regard them as a pure ‘construction,’ a creatio ex nihilo, and the question arises what it is that is being abstracted from, what the abstraction at the respective level is distancing itself from and to what extent.

6. The Schema Concept

The abstraction levels presented here are by no means used solely for categorizing. For it will now have to be shown that a uniform mechanism is at work at all the levels of abstraction outlined.

And here I would like to return to the concept of *schema*. Schemata, as I have shown in the previous chapters, exist in all media; and especially in visual media, the concept of schema is less controversial and less counter-intuitive than, for example, that of the sign; accordingly, only the concept of schema seems to me to be general and powerful enough to moderate the breaks between the various individual media. Schemata, that is the core of my argument, are stabilized form; and, as I have shown in the chapter ‘Schema Formation,’ one can order the media according to a hierarchy that leads from the ‘soft schemata’ of real perception to the ‘hard’ ones of formal languages:

hard schemata ↑		Numbers, data, formal languages, mathematics
	Signs	Writing
	↑	Oral language, music
	Stereotypes, rules, genres	Photography, film
↓ soft schematization	↑ Schemata[7]	(Perception)

What all levels have in common is that they are *all types of schematization*. The different media stand for different levels, different degrees of hardening within schematization.

If we turn the matter around and look at it from a processual perspective, the schemata appear as *precipitation*, as a product; only at a certain stage of hardening, which was also the subject of the above-mentioned chapter, does the phenomenon of constituted *signs* appear; signs, in turn, can be integrated into systems of rules varying in their strictness; and again, formal languages seem to surpass 'natural' language, at least in terms of strictness.

7. The Loop Through Experience

As soon as abstraction and formalization are understood as a gradual withdrawal from the concrete, the impression is dispelled that reference to the world no longer plays a role in the field of formal languages. However, the question of how formal languages and formal models organize their reference to the world remains open.

First of all, it is striking that although formal languages assert their complete independence from world realities, at the same time they have diverse, very fruitful, and far-reaching *applications* in this real world. The sphere of technology is inconceivable without the models of mathematics; economic and organizational problems are formulated in formal languages and written back into the world from there. This application dimension of formal languages would probably not be disputed by anyone.[8]

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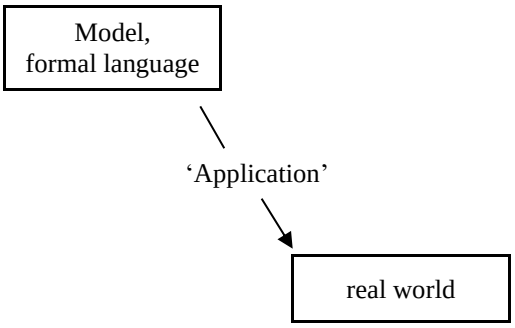
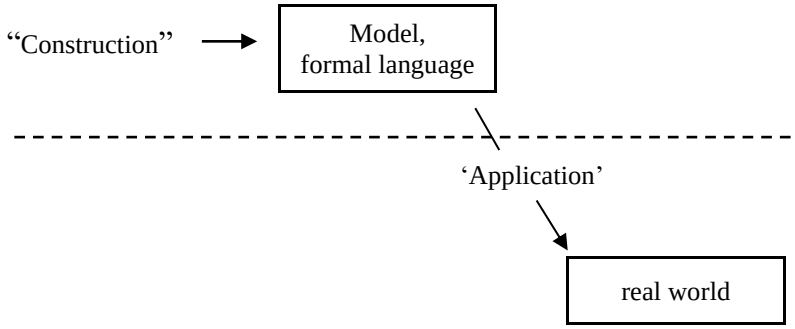
[7] From the fact that real perception is already schema recognition, Susan K. Langer builds a bridge to the concept of *form*: "the world of pure sensation is so complex, so fluid and full, that sheer sensitivity to stimuli would only encounter what William James has called (in characteristic phrase) 'a blooming, buzzing confusion.' Out of this bedlam our sense-organs must select certain predominant forms [!], if they are to make report of *things* and not of mere dissolving sensa. The eye and ear must have their logic—their 'categories of understanding,' if you like the Kantian idiom […]. An object is not a datum, but a form construed by the sensitive and intelligent organ, a form which is at once an experienced individual thing and a symbol for the concept of it, for *this sort of thing*." "The abstractions made by the ear and the eye – the forms of direct perception – are our most primitive instruments of intelligence. They are genuine symbolic materials." (Langer, Susan K.: Philosophy in a New Key. A Study in Reason, Rite, and Art [1942]. Dublin: Mentor 1954, pp. 72, 75 (emph. H. W.)).

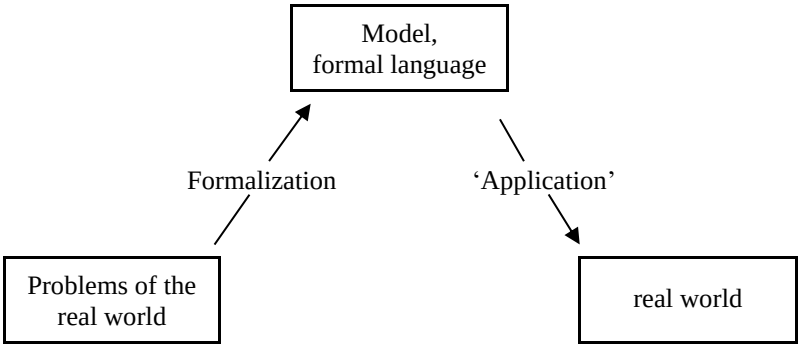
[8] However, it must be said that there is a certain aristocratic disdain for 'applications' in the specialist cultures of both mathematics and computer science. This seems to me to be part of the problem and part of the self-image that ~~the~~ these disciplines are dealing with pure constructions.



At the same time, the performativity debate has also drawn attention to the effect that signs have in the non-symbolic world. Much more critical, however, is the question of what brings formal languages themselves into the world. As described, Heintz emphasizes their character as a ‘construction,’ their fundamental independence from the problems and structures of the real world.

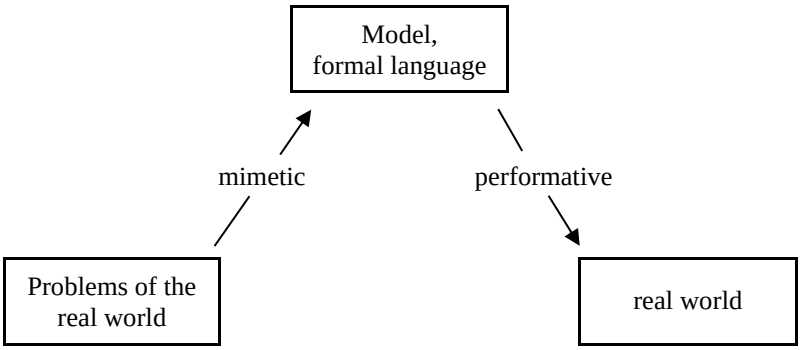


This view does not seem very plausible to me. If one looks at the actual history of mathematics and formal languages, one can see that they develop and evolve – at least to the same extent as according to the rules of their own logic – in a close interrelationship with real-world problems. The abacus emerged in the context of administrative and economic ‘applications’; the Hollerith machine was intended to solve organizational tasks, and the computer to solve deciphering problems. This also ties the formal languages back to the real world and its problems, namely in terms of model creation:

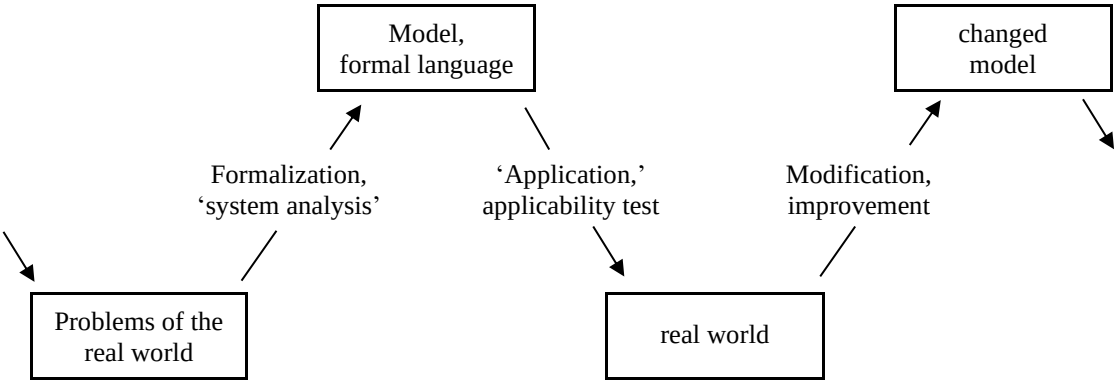


The left-hand side is that of ‘system analysis’ or model building; a problem arises in reality, and the system analyst has the task of penetrating this problem to such an extent that it can be formulated in the rules of a formal language.

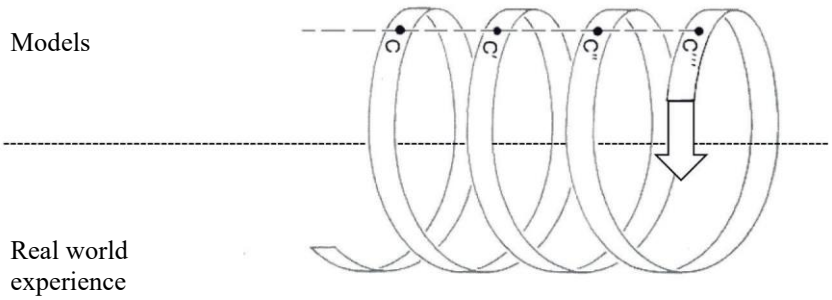
I would like to call this – precisely because the term is initially counterintuitive – the *mimetic dimension* of formal languages. Models formulated in formal languages and formal languages as a whole prove to be not only applicable, but they are constantly measured against application contexts and are gradually developed further in confrontation with these contexts.



Extending the time axis results in – how could it be otherwise – the model of a cycle:



At the same time, this means that model building remains systematically related to the sphere of *experience*. The development goes cyclically through experience again and again; models prove to be suitable or unsuitable, fruitful or unfruitful, are verified or falsified.[9]



[9] The need to view the relationship between science and technology as a cycle, as a reciprocal interdependence, was emphatically advocated by Latour in particular. In doing so, he opposes the traditional idea that attempts to understand technology – one-sidedly – only as an 'application of science.' Latour's main point also lies on the left side of the cycle: in demonstrating how much 'pure science' also owes to technical practices. At the cost of the models of science no longer being 'pure.'

The models, as I said, can be suitable or unsuitable, and appropriate or inappropriate to what is to be modeled. Especially if one argues with 'experience,' it will have to be made clear that the passage through experience by no means guarantees that the models are 'realistic,' 'true,' or even useful. Exactly as in the case of all other signs and sign systems, formal models can be distorted, or they can go completely astray. My claim is only that they remain in relation with what is to be modeled. A calculated weather forecast is measured by the weather that actually occurs; a structural engineer's algorithm is measured by whether the building remains standing.

And the same applies – at least in principle – at the level of the formal languages themselves that are used for modeling, even if the adaptation process is less direct and the cycles are longer.

8. Counterargument: Internal Coherence

The idea sketched out in this way does not seem very risky, to the point of being self-evident. Nevertheless, there is a weighty argument against it. For wasn't the thesis above that formal languages, primarily, follow an inner, intrinsic logic? And wasn't the decisive criterion that distinguishes formal languages from 'natural' ones that only formal languages fulfill the criterion of internal coherence and consistency? Is this not plausible? And an almost irrefutable argument for 'construction' after all?

The point becomes even stronger when Krämer makes *correctness* the decisive criterion for formal language formulations and argues that with formal languages the traditional question of truth is replaced and rendered superfluous by the question of correctness.[10]

Correctness means inner coherence; however, in the transition to correctness, the reference that was still indispensable for the concept of truth is cut off. In the case of formal systems, correctness can be checked and established beyond doubt in every case; if the formal system is implemented on a computer, the machine takes over the logical-mechanical consistency check. So how does this fit in with the assumption that formal languages also remain dependent on mimesis and experience?

It must be said here that models formulated in formal languages – as self-sufficient as they seem – are always and necessarily *incomplete*. In concrete terms, this means that doubt now attacks the system from the outside – from the context – although or precisely because it so carefully arms itself internally against doubt by adhering to freedom from contradiction. The problem shifts, I think, to the relationship between the model and its context.

It is obvious that formal languages are dependent on contextual additions; this begins with the clay tablets of Sumer, whose lists contain not only numbers but also words that provide contextual information. And it has remained that way throughout the history of media; anyone who buys a software package today will always receive a helpfile with it. The helpfile is by no means external to the software. Rather, it stands for the interface between modeling and the modeled problem; and it moderates between the possibilities offered by the formal language system and the various frictions that arise when it encounters the problems of the real world. *This moderation* – and this is important – *cannot be achieved by formal language with its own means*. Natural language comes to its aid and helps it out of a jam. The schema above would have to be modified accordingly, because system analysis and 'application' as a matter of course also make use of the mediating power of language.

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[10] "The formal handling of symbols according to rules that make no reference to the meaning of the symbols [...] also becomes the guiding principle of the epistemological ideal of rationalist philosophy, which consists in tracing truth back to correctness." (Krämer, Sybille: Sprachphilosophische Grundlagen des Begriffes 'Performanz.' Performativität als Medialität. Unpublished manuscript 1998, p. 5 (transl. H. W.)).

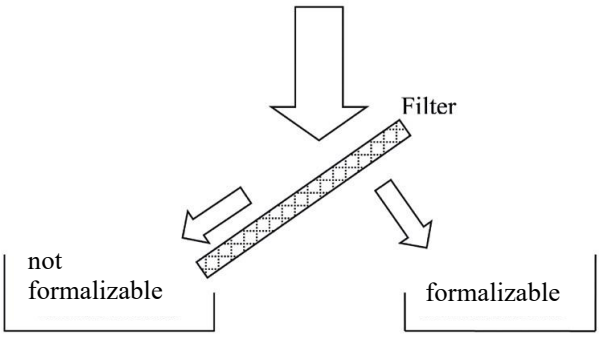
When mathematicians talk to mathematicians in formulas, and computer science and mathematics develop their formal systems in relative isolation from the world, this is a special case in terms of what has been said. An effect, one could say, of the social division of labor that isolates the members of these disciplines and interrupts interaction with the fields of application for a certain phase of production. In this respect, it is a kind of optical illusion that conceals the fact that formal systems are in rapport with the real world via mimesis and 'application.' Only in this way can the appearance arise that formal languages develop 'autonomously.' In fact, formal languages are dependent on the existence of other media.

10. Filter

This entails simply excluding those problems that resist formalization (i.e. the articulation in a formal language) from the field of interest and, as an inevitable consequence, leaving them to the 'softer' symbolic systems – the softer forms of form. This is also a variant of division of labor. Seen as a whole, a kind of filtering process takes place, an ongoing examination of what can be formalized and by what means, and what must be eliminated because it cannot be formalized. This filtering process is the main large-scale social experiment that takes place in the sphere of formal languages.

Every insurance company tests its probability algorithm against the perils of the dirty, pluralistic real world; every engineer who builds a bridge tests not so much the bridge as – with the help of the bridge – the calculated model on which its steel construction is based. Only under this condition, only because their terrain is limited, can formal languages be both: inherently free of contradictions and fruitfully applicable to practical purposes. And this dual position constitutes their special role in the concert of media and symbolic systems.

All problems that cannot or cannot yet be formalized fall back all the more decisively on the traditional media. The filtering process must therefore be viewed from a dual perspective: On the one hand, it delivers the formalizable; on the other, that which cannot be formalized.

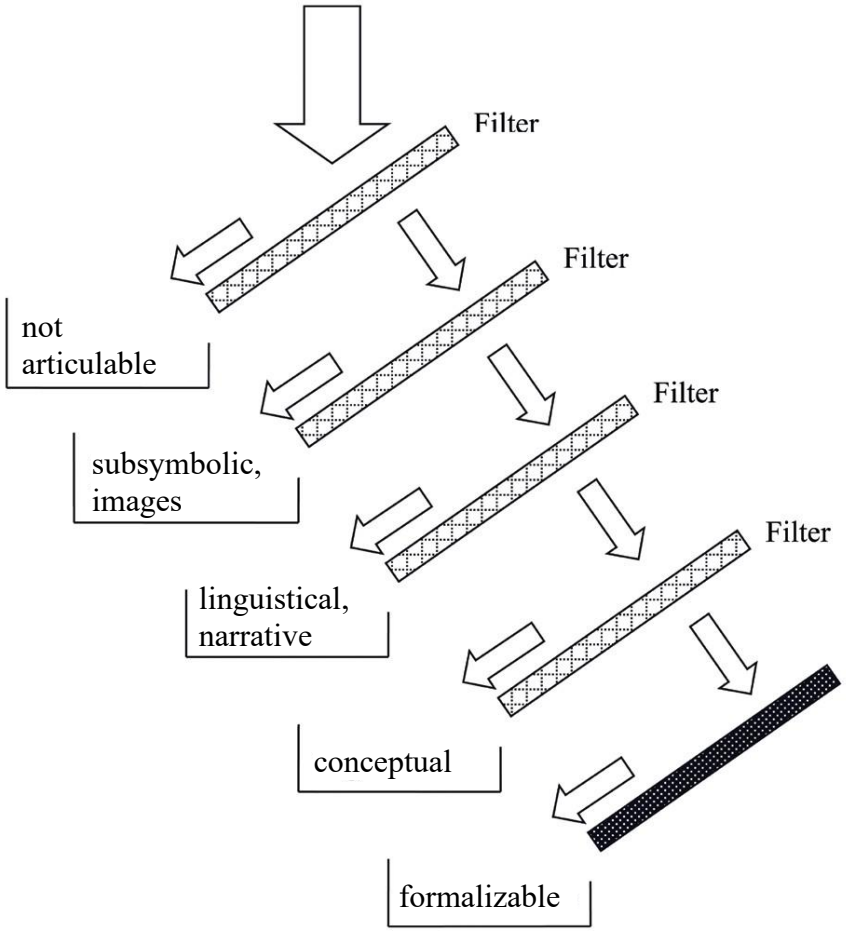


The boundary between the two spheres, as historically changeable as it is, organizes, among other things, such dramatic things as the relationship between the 'two cultures.' And it divides the computer itself; only on one of its sides is it the paradigmatic medium of formalization; but many, perhaps most, of the processes that run on computers also have another, rather conventional side: Computers can transfer, store, and permute images, but computers cannot process images according to content criteria (or understand images); digital images therefore only exist because the users are part of the arrangement; and contribute skills that cannot be formalized.

11. Machines for Extracting Form

So what is the result of the consideration outlined here? My proposal is to think of media overall according to the model of formalization; as a social machine that constantly and continuously tests the formalizability of the world.

And as described at the beginning, it is about formalizability on different semiotic levels: Images are less formalized than the concepts of natural language; these in turn appear informal or 'soft' compared to formal languages.



If we consider once again that the starting point is not semiotic but real-world problems, and that the decision as to whether these problems can be symbolized or not is only made in the filtering process itself,[11] we can say that media progressively extract from the world whatever form is contained in it. *Media, then*, as I return to my formulation from the schema chapter, *are a social machine for extracting and inscribing form.*

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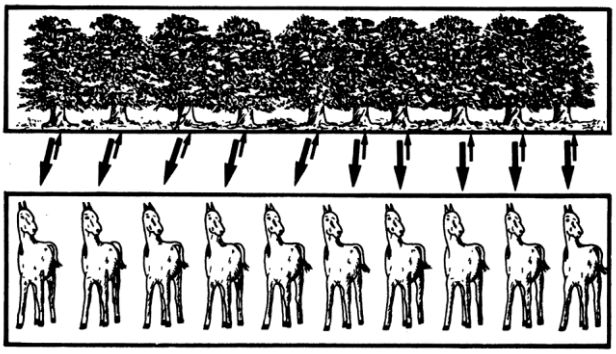
[11] The boundary between the symbolizable and the non-symbolizable is the central theme of Langer (op. cit., pp. 63ff.). What is called 'subsymbolic' in the illustration, Langer would call 'presentational symbolism' (ibid., p. 78f.). "[T]he symbolism furnished by our purely sensory appreciation of forms is a *non-discursive symbolism,* peculiarly well suited to the expression of ideas that defy linguistic 'projection.'" (Ibid., p. 75.) "Everybody knows that language is a very poor medium for expressing our emotional nature. It merely names certain vaguely and crudely conceived states but fails miserably in any attempt to convey the evermoving patterns, the ambivalences and intricacies of inner experience, the interplay of feelings with thoughts and impressions, memories and echoes of memories, transient fantasy, or its mere runic traces, all turned into nameless, emotional stuff. […] There is, however, a kind of symbolism peculiarly adapted to the explication of 'unspeakable' things, though it lacks the cardinal virtue of language, which is denotation. The most highly developed type of such purely connotational semantic is music." (Ibid., pp. 81f).

12. Similarity

And as if all this were not disputable enough, we now have to go a decisive step further, because my hypothesis was that everything we call form is a certain type of similarity. So why and to what extent similarity?

In my chapter on context, I defined similarity as something that connects things behind their backs.[12] And my consideration of 'characteristics'[13] provided some additional aspects: Comparison and similarity divide things into those aspects that are 'similar' and those that are 'dissimilar.'

Similarity thus extracts something from things; with the point that this 'something' (the aspect, the respect) only takes shape in the process of comparison and the detection of similarity. Precisely these new 'shapes' are the point. As soon as they are created, they are reified and stabilized, they take on form [!]; or – better – very different forms: What things have in common, what makes them similar to one another, can be a *characteristic*, such as the characteristic 'red,' for which language finds the label, the adjective 'red;' the common/similar element can result in a *schema* that makes it possible for us to recognize an elephant as an elephant, or in a *term*, such as the collective term 'animal,' which encompasses creatures as diverse as cockroaches, crows, and crocodiles. Or in *abstractions* such as a number, which sets aside all qualitative determinations in order to make only quantity the defining characteristic (which Ifrah illustrates by relating a quantity of trees – regardless of all their qualities – to an equally large quantity of horses):[14]



Generalized: The commonality/similarity leads to a *form*. Form, that is my assertion, is something that is extracted from things. Form is the most abstract type of similarity, which corresponds completely to the other types I have mentioned – as different as they undoubtedly are – in terms of function. And of course there are also very different concepts of form; the concept of form in aesthetics, as I said, differs from that of formal languages; what they all have in common, however, is that they are all abstractions.[15]

Abstraction is the defining characteristic of form; and similarity – albeit a possibly abstract one – underlies the mechanisms of abstraction; for this reason alone, it was problematic when Cassirer referred to 'similarity' solely in terms of the sensorially concrete.[16]

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[12] See W., Ähnlichkeit, op. cit. (FN 1), pp. 66-72.

[13] Ibid., pp. 93-116.

[14] Fig.: Ifrah, Georges: The Universal History of Numbers [1981]. NY: John Wiley & Sons 2000, p. 10.

[15] An interesting and important exception becomes clear when one refers to the 'form' of an individual work of art; here the form stands for the radically singular.

[16] The 13th chapter of my book is about Cassirer's concept of 'form' (see W., Ähnlichkeit, op. cit. (FN 1), pp. 217-238).

And one can easily extend the range of types yet again: Even if one asks what a *rule* is, one will come across abstraction and similarity, insofar as a rule always subsumes many cases, or conversely extracts what is rule-like from a multitude of cases. What is special here is that we are dealing with processes, with regular sequences along the axis of time. And if we go a little further, we arrive at causality and law...[17] And finally, even the laws of nature represent a type of 'similarity,' regardless of whether one counts them on the side of observation or on the side of the observed.

Once again: I am of the opinion that it is possible *to define form as a similarity extracted from things*. This similarity extracted from things becomes independent and takes on different forms at different levels of 'hardening': At the level of the schema, it already appears stabilized, at the level of the sign it is actually reified (insofar as signifiers have a material character). At the same time, the similarity fans out into different types of form.

From level to level there is a gain in form; the abstraction, the 'formal' character increases; the individual, the concrete, that which is abstracted from via similarity, remains behind – until finally the impression arises that the connection to 'content' has been broken and that form can be regarded as 'pure' (as independent of experience) at the level of formal languages.

My thesis is that the connection never breaks. That the concrete and the abstract, content and form, the object to be understood and the concept – however precarious – remain related to each other; connected by the mechanism that turns the concrete into forms via similarity. (That the connection *does* remain precarious, that signs 'lie' and cannot guarantee reference to the world, abstractions cannot guarantee reference to the concrete, and forms cannot guarantee content, has been shown irrefutably by the philosophical critique of signs).

Cassirer is therefore certainly right when he develops a comprehensive concept of 'form' that encompasses all forms of forms, from perception to the laws of nature. And he is also right insofar as he refers to these forms as 'symbolic forms,' thus assuming a close connection between the formation of forms and that of symbols.

What remains underexposed in Cassirer's work, in my opinion, are the mechanisms of abstraction itself, the path that leads from the concrete to the forms, and precisely the constitutive role that similarity assumes here. Because he also polemicizes against mimesis, the connection back to the concrete also threatens to break off in his work.

If one is looking for approaches that systematically think mimesis and form together, one could mention Adorno, for example, who in his aesthetics develops the thesis that *art* has its place between expression and form;[18] whereby – strongly simplified – the pole of expression stands for subjective experience, emotion, mimesis, and essentially suffering, and the pole of form for objectification and reference to the universe of other forms (think of styles, for example). Working out this reference would be a challenging project in its own right.

I would just like to adopt the basic idea here: That form is possibly the antipole of mimesis, but as such remains related to mimesis. That form distances itself from experience but does not eliminate it; and that – even in the field of formal languages – experience and mimesis must always be considered.

For any theory of perception, of schemata, of signs, and of media, such a concept of 'form' is of central importance. And my thesis is precisely that – as little as the individual cases and the forms resemble each other – form is nothing other than similarity extracted from things.

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[17] Cassirer names causality among the 'symbolic forms' that are, for example, of central importance for the natural sciences...

[18] Adorno, Theodor W.: Aesthetic Theory [1970]. London/Boston: Routledge and Kegan Paul, 1984.

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