In brains we trust: How neuroeconomists stylize trust, the brain, and the social world
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Chapter 7

Conclusion: Trust in neuroeconomics, trusting neuroeconomists

theories gain their meaning during travel

Schaffer (2010, p.279)

7.1 Introduction: Back through Fleck

Neuroeconomics: the name suggests one thing, its practice reveals a whole lot more—that is what I have shown in this dissertation, and what I unpack in this last chapter.

To start with, while the name neuroeconomics brings to mind, first and foremost, the idea that phenomena of interest to economists can be reductively explained in terms of neurobiology, we have seen that in fact much more is at play here. The analysis in the foregoing chapters has displayed that the stylized facts about trust, which research by neuroeconomists yielded, concern an object that is unintelligible if one does not taken into account the historically developed style through which it has come about. Moreover, these facts have come to circulate well beyond the confines of the esoteric circle of neuroeconomics and their implications potentially extend well beyond the walls of academia.

Let us start the path toward the further exposition of these and related conclusions by returning to what this undertaking started with, namely, the observation that by using functional magnetic resonance imaging (fMRI) technology, both trust and the involvement of
the neuropeptide oxytocin in trust have become epistemic objects investigable in the laboratory. In chapter 1 we looked at this via a narrative reconstruction of Baumgartner et al.’s (2008) study. This served to illustrate the more general observation that during the last decades the sciences of the brain have become a dominant cultural force that has managed to gain a foothold in all kinds of academic fields. In addition to the inroads made into the study of social and economic decision making, neuroscientists have also extended themselves to investigate religion, aesthetics, morality and consciousness. Thereby they have added force to the claim that “we are our brain,” meaning that if we know more about patterns of neuronal activation and about the presence and distribution of neurotransmitters and the like, this significantly adds to what there is to know about who we are, what we do, and why we do it. Even while recognizing that the neurosciences probably do not constitute a similarly dominant intellectual force as cybernetics and genetics once did, it is nonetheless undeniable that today we have come to inhabit a world in which the neurosciences are among the “imperial sciences,” captivating an ever larger field of the reality we live in and live by.

The emergence and propagation of neuroeconomics (chapter 4) and its stylization of trust (chapters 5 and 6) have figured to make this wide-ranging expansionism of the neurosciences investigable. Additionally, in chapter 3 the genesis and development of the conviction and practice of localizationism was analyzed—one of the central elements in today’s neurosciences. Altogether, these have granted us a view of the many piles (i.e., the many linkages actively engaged in the neuroeconomic stylization of trust) upon which the neuroeconomic construction rests. Thus we have found that the quantity of those piles matters more to the solidity of what is erected on top of it than the firmness of any of them individually.

Now it is time for me to articulate the lessons we have learned concerning the style pertaining to the new laboratory science of (social) decision making called neuroeconomics and, through this, the lessons about the growing cultural significance of the neurosciences. In doing so, however, I will simultaneously recapitulate the preceding chapters and further analyze, and make a case for, the philosophy of science developed by Ludwik Fleck that was employed in this analysis.

To start with the latter, my use of Fleck’s approach in the philosophy of science allowed for a discussion, within one framework, of any and all of what would conventionally be classified as ontological, epistemological, research-organizational, literary, rhetorical and social issues implicated in science. This is a result of Fleck’s thoroughly historicized and materialist relationist view of science and the reality studied by it. In Fleck’s words:

*cognition is neither passive contemplation nor acquisition of the only possible insight into something given. It is an active, live interrelationship, a reshaping
and being reshaped, in short, an act of creation. Neither the ‘subject’ nor the ‘object’ receive a reality of their own; all existence is based upon interaction and is relative. (Fleck 1986a, p.49; italics in the original)

This relationist view of knowledge and existence has obvious implications for the philosophical study of science and leaves no room for any of the common dichotomies and preconceptions that are at play in more conventional philosophical approaches to science and knowledge (i.e., approaches that do call for a neat division of problem areas across philosophical subdisciplines). Moreover, the Fleckian approach in the philosophy of science ensures that attention is not exclusively directed at ideas, theories and concepts, thus counteracting a conventional selection of objects of philosophical analysis. Instead, attention is directed toward scientific practices in all their material, social, historical and technological complexity, bringing into view not only how ideas develop over time but also how epistemic objects evolve concomitantly. One of the questions pursued below concerns the relationship between such developments in epistemic objects and the world outside the experimental system in which these are pursued.

Such issues come into view when one’s epistemological investigation takes into proper account “the burden of Tradition, the weight of Education, and the effect of the Sequence of the acts of cognition” (Fleck 1986a, p.47). Thus, returning to this triad of interrelated and interacting systems of factors which according to Fleck have their role in practices of knowledge acquisition, the structure of this last chapter is as follows. In section 7.2 I will highlight the historicity of the thought style of neuroeconomics. Subsequently, in section 7.3 I will return to the issue of how style directs perception. This brings to the fore that the pair of protagonists traditionally populating epistemological treatises—knowing subjects (scientists) and objects known (epistemic things)—cannot properly be understood in isolation from a third protagonist—the styles which are shown to be such essentially historical creatures in section 7.2. This brings me to the last of Fleck’s three factors, sequentiality, which will be discussed in section 7.4. By analyzing the neuroeconomics of trust with an eye to this third factor, it will be shown how it is that all those facts about trust which neuroeconomists have assembled together, are dependent upon the style through which they are forged—something which ordinarily remains hidden. Passive facts can only emerge and remain passive facts as long as one does not trace back all the active linkages scientists have invested in. After this, in the last two sections I will return to the two core concepts in Fleck’s philosophy of science: style (section 7.5) and collective (section 7.6). Thus, in section 7.5 I will further articulate both what is distinctive about the style of neuroeconomics and in what sense it is representative of contemporary science more generally (section 7.5), to finally close of with a discussion of the wider significance of neuroeconomics in section 7.6. Here I will first show that trust, as stylized in neuroeconomics, depends for its
establishment on trust as we encounter it in everyday life, and subsequently deal with the question of what happens when the former travels outside the esoteric circle that is its home.

7.2 Tradition

Trust, so neuroeconomists tell us, entails that one lowers one’s defenses, that one has less fear for one’s counterpart in social interactions. Furthermore, neuroeconomic research suggests that this reduced fear, observed when experimental subjects who have received intranasal administrations of exogenously produced oxytocin display trusting behavior, is mediated by decreased activity in the amygdala, a mass of grey matter with a shape akin to almonds found within the cerebral hemispheres. Oxytocin, to repeat, is a neuropeptide also endogenously released by the pituitary gland in humans. When trusting behavior is observed in individuals who have had oxytocin administered, furthermore, this trust is also mediated by a decreased capacity to learn the contingencies of a social interaction. Specifically, when trusting an exchange partner, regardless of whether that partner proves to be untrustworthy, one exhibits poor mental processing—a phenomenon that, in this case, is correlated with decreased levels of activity in the striatal caudate nucleus. Evidence for this claim, again, has been collected from subjects who were administered oxytocin. Moreover, trust entails that one “mentalizes” (i.e., reasons about the thoughts, feelings and motives entertained by one’s social interaction partner). This mentalizing is in turn mediated by the paracingulate cortex (PeC), a brain region known for its implication in cooperation. A closely related phenomenon—empathy—is also implicated in trust. For this the temporoparietal junction (TPJ) is the main mediator, an area of the brain also known to be involved in moral decisions. Lastly, if it were not for the human capacity to deny one’s desires temporarily and settle for a postponed but possibly magnified gratification of those desires, we would never trust anyone. Cooperative decisions that involve such “inhibition of immediate reward gratification” (McCabe et al. 2001, p. 11834), such as decisions to trust one’s counterpart, are mediated by the frontopolar cortex (FPC).

That is what neuroeconomists tell us when we ask what trust is, where it takes place and how it works. It is a richly layered answer, involving the efficacy of the neuropeptide oxytocin and encompassing various psychological faculties, each of which mediated by its own localizable part of the brain. In chapter 6 it was argued that all such results constitute facts only if one ignores the collection of style-complying active linkages by which those results were reached. That is to say, the very process through which results (such as those communicated by neuroeconomists in regard to trust) come to appear like facts that are independent of a particular stylization and scientists’ active investments, simultaneously
disguises the traditions behind those results. Even though facts cannot be properly understood in isolation from tradition, we constantly do understand them in this fashion. Hence neuroeconomists would have us believe that trust occurs in the brain, without raising the question of whether or not the identity of that trust which they identify might have changed from when neuroeconomists first conceived of trust as an epistemic object.

Articulating this view, we have traced a diverse set of active linkages engaged in the neuroeconomic stylization of trust. Thus, we have seen that if it were not for neuroimaging technologies such as fMRI, neuroeconomic answers to the question of what trust is and where it takes place would be difficult to conceive of. Moreover, we have learned that the idea that psychological functions can be localized in specific parts of the brain is much older than are today’s technologies of functional localization. Indeed, in chapter 3 I identified a proto-idea to today’s localizationist consensus in Herder’s philosophy: that “everything has been fashioned by the organic powers operating from within outwards.” It is due to Gall’s phrenological work that this thought of Herder’s can be said to have presaged the idea of localizationism.

Images displaying a capacity, disposition, or mental state in a specific part of the brain belong to the iconography of contemporary science, and this surely gives the idea of localizationism a certain straightforwardness. But the route to our current scientific knowledge has been anything but straight. More precisely, this route does not conform to the standard conception of scientific progress, according to which science progresses by testing empirical hypotheses against reality, resulting in an ever better grasp of reality, an ever greater amount of detail in our information about the world. Rather, localizationism started out with a proto-idea that was not at all a candidate for scientific truth at the time of its first formulation. And despite all the progress that has been achieved within the style that engaged localizationism, to this day it is itself a matter over which controversy rages.

Returning to what connects our present to its history, the series of linkages that stand in between Herder’s proto-idea of localizationism and today’s localizationist practice do not appear to enshrine the merit of necessity. The history of the neurosciences displays all sorts of indeterminacies, and the fact that many of the discussions that captivated scientists of the brain some 100 years ago are still topical today is, of course, illustrative of this. Thus, localizationism is certainly practiced today. But not without being contested within philosophical, methodological and scientific quarters, as we saw in chapters 3 and 6. Whether localizationism will remain forever with us cannot be settled here and now of course; though for now, most neuroscientists display a collective trust in the modularity of mind and brain and in the idea that both types of modules can be mapped onto each other.

Thus, it has become clear that facts, such as those regarding where trust occurs, have a history, and that this history matters. But what is this history that is so important to these
facts? Often the history of science is approached as if it consisted of a series of ideas, where one comes after the other until finally we have reached the present; our present. However, as Fleck writes about investigating the history of science,

[i]t is as if we wanted to record in writing the natural course of an excited conversation among several persons all speaking simultaneously among themselves and each clamoring to make himself heard, yet which nevertheless permitted a consensus to crystallize. The continuity in time of the line of thought already mapped out must continually be interrupted to introduce other lines. The main line of development often must be held in abeyance to explicate connections. (Fleck 1979, p.15)

Fleck does not just articulate the complexity of science and the lack of unidirectionality in its development; indeed, we have seen that he highlights the relative importance of connections over isolated events and the fact that history matters when dealing with philosophical questions of knowledge. In the context of epistemology Fleck thus replaces the traditional two-place relationship between subjects and objects with a three-place relationship, where the third place is granted to all that counts as precondition to scientific knowing: the styles carried by collectives of researchers; the collectives carrying, transmitting and continuously altering those styles; the wider circles of collectives and their members with which esoteric circles are surrounded and with which they maintain an interactive and reciprocal relationship; and, of course, the history of knowing which shapes styles and which Fleck captures under the rubric of tradition.

7.3 Education

The understanding of the neurosciences attained here, which so essentially depends on a grasp of its historicity, hardly resembles the thorough understanding of the neurosciences that practicing neuroscientists display. There is a gap between the historical-epistemological type of understanding of the neurosciences which, building on Fleck’s philosophy of science, I have demonstrated here, and the understanding of the neurosciences demanded when investigating any of the tremendous facets of the brain and its relations with, for instance, perception, memory, consciousness or action that neuroscientists are interested in. But the interest in the history of neuroscience is surely not the only thing that divides neuroscientists from analysts of neuroscience. First, this is because, insofar as history figures here, it does so with a better philosophical understanding of the science at issue in mind. Second, this is because more than only history comes into view when taking a Fleckian perspective on science; the question of how people enter the esoteric circles they work in is but one example.
Let us for a moment return to Fleck’s metaphor on the development of science quoted in section 7.2. The linguistic transmission of ideas was central to this, but paying attention to education makes it clear that there is much to say about the nature of such scientific conversations. For this reason, in chapter 4 I analyzed one of a variety of routes by which the esoteric circle of neuroeconomics might be arrived at. My analysis showed that education, or initiation, counts, and that it comes with its own literary forms. And indeed, the important thing to consider here is that a Fleckian philosophy of science invites one to look not only at series of ideas, but also at all the material, technological and, in this case, literary equipment enrolled in scientific practice. Insofar as attention is paid to ideas, then, it is to ideas in their place, to ideas as they are instantiated and insofar as they fulfill a particular role in scientific practice.

Moreover, in chapters 4–6, I established that these places, the contexts in which ideas figure, codetermine how ideas are transmitted and to whom they are transmitted. Practices having to do with the transmission of ideas, their respective audiences, and the media used, are all potential objects of inquiry in a Fleckian philosophical study of science. As became clear, especially from chapter 4, context, in the sense used just now, is more than a passive container; contexts, too, can be and are chosen. As neuroeconomics is being marketed to an ever wider audience among those near its esoteric core, as we saw Damasio do in his introductory article (2005), the road to a blooming future is being paved. Provided that this road is traveled by a sufficient number of hard workers, of course.

The focus on such material aspects of science as education and the literary forms it comes with is an essential part of Fleck’s way of bypassing a traditional dichotomy constitutive of epistemology—the dichotomy between knowing subjects and objects known. The standard positivist way of filling in this dichotomy, one still followed to this day, entails that objects are what they are, quite independently from how subjects come to know them and that, vice versa, subjects too are what they are independently from the world they know. That knowledge of the world can take many shapes, as in fact the history of knowing displays, is something of a mystery in this view. Recognizing the importance of education in scientific practice affects this entire picture, and helps dissolve the mystery.

Determining the pivotal role of education in scientific practice brings to light that the knowledge members of a scientific collective gain of the world of facts is not the result of direct perception but rather the outcome of directed perception. Perception is directed through the style one comes acquainted with and adopts during one’s (continuous) education in a specific science—where style is codetermined by tradition, of course. In the process, both the members of the collective and the epistemic object at hand in the particular experimental system are affected—in the course of time no one and nothing ever stays the same. As we saw in this chapter’s opening section, Fleck stated that, “cognition
[... ] is an active, live interrelationship, a reshaping and being reshaped” (Fleck 1986a, p.49).4 Thus, where in the previous section I emphasized that the styles directing perception have a history that counts, making for what Robert Cohen and Thomas Schnelle call its “vertical embeddedness in cultural history” (1986, p.xxv), examining the role of education in transmitting styles helps us see that styles also have what could be called a “horizontal embeddedness” (Cohen & Schnelle 1986, p.xxv), that is, an inextricable relation with social factors in the present—where “social” includes such things as the literary conventions at play in different genres of scientific writing.5

7.4 Sequentiality

The third Fleckian theme we need to discuss concerns “the effect of the Sequence of the acts of cognition” (Fleck 1986a, p.47). The basic idea is that, as Fleck stated,

the course of science is immensely influenced by the sequence of the solutions, for it determines the development of technical possibilities, the education of the researchers of the future, and the formation of scientific concepts and comparisons. (Fleck 1986a, p.51)

Before we go and see what this sequentiality means when looking at the neuroeconomics of trust, let me first make a brief comparison. For the idea that the sequence of things makes a difference has also made a fair impact in economics and other social sciences, be it under the label of path dependency. Thus, economists Stan Liebowitz and Stephen Margolis write that

generally, path dependence means that where we go next depends not only on where we are now, but also upon where we have been. History matters. (Liebowitz & Margolis 2000, p.981)

The reason I direct attention to this resemblance is that I wish to avoid unwelcome associations. Making things explicit helps. Thus, an important difference between the idea of sequentiality espoused here and the idea of path dependency as often taken aboard by economists, is that the latter use it as an explanation for imperfect economic allocations. People, governments, companies and so on do not behave as (rationalist) economic theory predicts, making for a divergence between the allocation of goods under conditions of scarcity as predicted by economic theory and their actual allocation. The concept of path dependency helps explain that history is to blame, or rather, that such historically contingent and variable entities as institutions, conventions and cultures are.

In my analysis of the neurosciences and of neuroeconomics in particular, however, such a normative stance is not implied. Science develops as it does partly because of the history
it has had. There is no rational ideal, no standard of science-as-it-should-be or truths-which-ought-to-have-been-found-by-science against which science as it actually plays out in practice can be measured. Put yet differently, the third element in Fleck’s epistemology, history, cannot be eliminated. Eliminate this, and you eliminate science.

Chapter 6 concluded with an inventory of stylistic features characteristic of neuroeconomics (see p.168), containing everything from presuppositions to beliefs and to convictions held beyond all doubt. In addition, the locally commonsensical delineation of epistemic things belong here, as do the truth technologies neuroeconomists employ to get to the bottom of all those problems they confront. We have seen that (some of) the features of the neuroeconomic style listed at times function as active linkage and at other times as passive linkage. For instance, the relation between oxytocin and trust is what follows passively in Kosfeld et al.’s (2005) study and subsequently constitutes an active linkage in Baumgartner et al.’s (2008) study, which helps to identify mechanisms through which oxytocin works its spell and to locate regions in the brain that mediate these mechanisms. Thus, sometimes elements can function either as technical object or as fact. In their capacity as technical object they keep the neuroeconomic engine running, without themselves being at the center of attention. In their capacity of fact they are being presented as the endpoint of an investigation and as a component of how the world is, as if it were independent from any active linkages. That the sequence of events matters here is clear, but perhaps not very interesting—in this case the development of science can be straightforwardly understood as following a continuous line of progress.

However, in the course of chapters 4–6 we have also witnessed how neuroeconomists stylize trust by means of a large variety of other active linkages, linkages that were engaged from all sorts of less or more closely connected fields of research. For instance, even though, as a rule, a vague and generalized notion of trust populates introductions and conclusions to neuroeconomic publications on trust, in fact through the research technology of behavioral economics, trust is framed strictly as a particular kind of move in the (behavioral-economic) Trust Game (i.e., as a move in a game developed for scrutinizing strategic interaction between two (commonly anonymous) isolated strangers). Furthermore, we have seen that trust, as it is stylized in neuroeconomics, relates to the willingness of exchange partners to act in a certain way, but never concerns competence to do so. This is so despite the fact that, in colloquial speech and, for example, in developmental psychology and pedagogy, trust in competencies is considered to be no less important than trust in dispositions. And it is so because this is how trust can be operationalized in behavioral game theory—not because of anything more fundamental than that. It is trust thusly fashioned that neuroeconomists subsequently succeed in investigating with an eye to its underlying neurobiology. It is this trust, then, that can be increased by means of the
intranasal administration of oxytocin (chapter 5) and that is mediated by the amygdala, caudate nucleus, PcC, TPJ and FPC.

For trust to have been stylized in this way it was requisite that, parallel to the developments in quantum mechanics, chemistry, mathematics and neuroscience, which together provided neuroscientists with fMRI technology, economists informed by psychological methods and psychological insights took up novel methods of investigation and actively engaged in the development of a new theory of human action, one not as based in a priori assumptions of full rationality as had been conventional in much of economics before then.

It is in this sense that the sequence of scientific developments matters a lot, and that focusing on it brings into view more than simply an image of uninterrupted progress. For this sequence is not a matter of stringent logic or of ever-higher stacks of insights—or at least not only that. Insofar as the history of science shows contingencies of all sorts to have played a significant role in the resolution of many controversies, the discovery of a large abundance of facts and the development of a great many technologies, sequentiality is no small matter at all: when we look at how many lines of inquiry and technology come together in neuroeconomics, we look at a conjuncture, a truly extraordinary constellation.

To give another example establishing this, think of the voles that have proven to be such a crucial hub in the neuroeconomic investigation of trust. In order to be considered appropriate animal models, first the theory of evolution had to be accepted and a lot of genetic research establishing the similarity between voles and humans had to be done. It is in this vein that Fleck wrote that

we characteristically regard old, habitual trends of thought as particularly self-evident, so that no proof is required or even admissible for these. They constitute the firm foundations on which further construction is allowed.

(Fleck 1986a, p.47)

Scientists build their edifices using the construction material they have at their disposal. What this edifice is, then, largely depends on the history of the field and the style characteristic of it. The latter also implies that, when, for instance, neuroeconomists build on an insight gained in behavioral endocrinology, the original insight is transformed, such as is the case when vole behavior and its relation to oxytocin processing is used as a model of human behavior, leading neuroeconomists to test for the hypothesis that oxytocin is involved in human trust. The insight is transformed not simply because it changes from being a passive linkage into being an active linkage, thereby assuming a different functional role, but also because in that movement much is not only won but also (and necessarily) lost. For instance, the neural wiring of voles is lost. This is replaced by the neural wiring of humans, which is not the same. Also, the behavioral repertoire of voles is lost and replaced with that of humans. Again, this is not the same. The circulation of ideas, then, implicates
Looking at the development of neuroeconomics and its stylization of trust with the theme of sequentiality in mind brings into better view the contingent nature of the endeavor and its products. It helps us to realize that there is nothing necessary about our present conceptions, no matter how well established they are and how well they are grounded in state-of-the-art science and technology. This is not to deny or to debunk the value of neuroeconomics, but simply a reminder of the fact that the truths science reveals are man-made truths, the outcomes of knowledge practices that are bound to particular times, places, technologies, people, capacities and all the other factors the development of science has been shown to be contingent upon.

In sum, let me draw together tradition, education and sequentiality to finally enunciate the Fleckian epistemology as it was put to work here. Figure 7.1 displays how tradition, education and sequentiality link up to the central terms of Fleck’s philosophy that have been engaged throughout this endeavor: style, collective, facts and active and passive linkages.

Figure 7.1: Style–Collective–Facts: Epistemology according to Fleck.

*In place of epistemology’s traditional two-place relationship between knowing subjects and known objects, with a gap in between, a three-place relationship is presented, which immediately clarifies how it is that epistemology’s “subject” can come to know something about an “object”. Each such subject in this epistemological triangle is always a member of a collective carrying a particular style. Such styles are imbued with tradition and allow for epistemic objects to appear in such manner that their historicity and stylization becomes invisible—styles allow facts to emerge.*

We see that the scientific collective is shaped through education and conforms to a particular style, while simultaneously the style undergoes influences from what the collective undertakes. Thus, active linkages go both ways. Style, however, is not merely structured through the scientific labor of a collective structured in accordance with that style. Style cannot be understood independently of traditions of scientific and nonscientific thinking.
and doing, as we have seen. Facts, then, are stylized thought constraints. Since facts are
stylized, on the one hand, and constrain thought, on the other, here too active linkages
go both ways. Moreover, while there is no way for scientists to reach facts but via some
style or other, facts constitute precisely that category of things which appear as if they exist
independently of any active investment. This is why facts relate to the collective as passive
linkages.

Each of the elements of this triad helps emphasize science’s historicity and materiality and
provides a pointer as to the manner in which science can be studied from a philosophical
perspective. Moreover, putting to use the Fleckian armory has delivered a penetrating anal-
ysis of neuroeconomics. However, the road Fleck paved by articulating these themes at the
heart of science suggests something beyond this. That is to say, epistemology as the study
of styles, in Fleck’s view, ought to become a comparative enterprise. In his words:

If epistemology is meant to be a science capable of development, useful and
rich in a substantial way, it ought to broaden the range of its interest. It
must not be limited to the study of the domains and stages of science which
are officially recognized at the given moment, but, taking into account the
variety of thought-styles and the multiplicity of thought-collectives, it must
become a comparative science. (Fleck 1986b, pp. 97-98)

This call for epistemological comparison surely makes sense where the emergence and
dispersion of neuroeconomics are concerned. I will return to this idea in section 7.6.

7.5 The style of neuroeconomics

It is remarkable about neuroeconomics how many kinds of objects and investigative tech-
nologies feature in this approach to human decision making, and this defies the idea that
neuroeconomics boils down (only) to a neuroreductionist program in economics. Every-
thing from abstract philosophical assumptions on the nature of the relation between soci-
ety and biology to concrete entities such as oxytocin is equally vital to the success of the
endeavor. Not because no one linkage can be broken, but because the strength of the struc-
ture as a whole depends on the various and complex ways in which the many linkages at
issue relate to each other. This also helps understand that while several linkages in and of
themselves might not be all that robust, as we have seen in chapter 6, the structure remains
standing nonetheless.

For this reason, I call the style carried by neuroeconomists horizontalist. Furthermore, its
strategy might be called expansionist. Its expansionist strategy shows from the fact that, to a
large degree, its modus operandi involves ever expanding both the part of reality considered
investigable and the number of (proven) scientific methods engaged to this end. The style can be characterized as horizontalist because, for all the talk of biological foundations of social behaviors, we find that neuroeconomists present an ontology entailing many kinds of entities—be they psychological, neurobiological or behavioral. None of these is granted the final explanatory say or is considered the foundational bedrock of the enterprise. All this relates to the fact that neuroeconomists recruit linkages from various scientific and intellectual endeavors. Having analyzed these active linkages, furthermore, I have to conclude that the strength of the building thusly erected depends, first and foremost, on the manifold linkages holding each other in place. Put differently, in this style, explanatory hierarchies or depths appear to be secondary to the complexity of the network of linkages—a complexity that does not appear to have a natural limit. The building stands because it has many piles, not because they go so deep or because the few piles it rests on are entirely impeccable.

Two images are combined here to capture important traits of neuroeconomics. There is Popper’s view of science as a structure built on a swamp, held upright by a collection of piles that are driven down into a swamp, yet without ever reaching firm ground. And there is Fleck’s view of science as consisting of an intricate network of linkages which, depending on their functional role in the network, are either active or passive and which together make up facts, truth and so-called objective reality. Merging these images delivers a view of science that simultaneously emphasizes, again, two things.

First, due to the Fleckian part of the figure, it asserts that facts, truths and reality are not simply there, awaiting scientists who labor painstakingly toward their discovery. On the contrary, it requires scientists to actively link together material of all sorts to reach those passive linkages we call reality. Relating to the Popperian aspect of the figure, secondly, is the emphasis on the provisional character of scientific knowledge. Whatever shape our facts, truths and reality take, they never rest on such solid ground that they can be expected to hold forever. Common to these images is a recognition of the importance of historicity when it comes to understanding scientific knowledge. But where, for Popper, historicity affects only the statement of scientific facts, in the Fleckian view I have articulated, historicity pertains both to such statements as well as to the objects staged in such statements.

Without attempting to say anything about the “direction of fit” here, I emphasize that the style of neuroeconomics and the form of explanation and ontology it engages fit well within the broader exoteric circle surrounding neuroeconomics. This is because, along with philosophy and the social sciences as well as other biological sciences, neuroeconomics partakes in what we might call an “assault on human narcissism” (Rose & Abi-Rached 2013, p.234). To wit, it engages a form of explanation that leaves very little room for a con-
ception of human beings as rational beings who are transparent to themselves and act autonomously. Rather, humans and their brains are stylized such that they have to be understood as products of history, for instance through the evolutionary past that is always present in neuroscientific accounts of brain and behavior. Increasingly, historical pathways also come to matter through the many neuroscientific investigations into cognitive, emotional and affective development of people into adulthood.8

In addition to the emphasis on historicity, we also find that explanations as those construed in accordance with the style of neuroeconomics largely rely on and enact the popular metaphor of networks. Indeed, the brain is perhaps today’s exemplary instantiation or even the icon of a network. Taken together, these stylistic elements—emphasizing the complex networked nature of the brain on the one hand and its historical determination and dependence on developmental trajectories on the other—deliver a further characteristic, that is, unicity: no brain is exactly like any other. How the brain is stylized today, then, is clearly distinct from how it has been stylized for the better part of the twentieth century. Until not very long ago it was entirely commonsensical to liken the brain to a computer and, for many purposes, to abstract away from the brain’s precise biological, evolutionary and individual historical nature and the way each neural network and the behavior it gives rise to is dependent on that.9 Focus was more on the brain’s representational and computational powers then on its affective and emotional powers and the ways in which the brain is historically shaped and implicated in social contexts.

The concept of horizontalism constitutes an abstraction from the list on page 169, which characterizes the style at work in neuroeconomics, and one that simultaneously conveys several things. Namely, first, that the importance of networks is something the style of neuroeconomics shows in the cognitive organization underlying it, and, second, that this importance is something stated in the scientific outputs stylized in conformity with the style of neuroeconomics. Moreover, all this makes neuroeconomics a typical case in today’s landscape of scientific disciplines. For while we saw that neuroeconomists are in the business of erecting for neuroeconomics all that is typical of scientific (mono-) disciplines, it simultaneously is as multi-, inter-, or transdisciplinary as can be. Just as are all those alleged disciplines that are themselves enrolled in the neuroeconomic endeavor, from behavioral neuroendocrinology to molecular chemistry and behavioral economics. Arguably, then, through the examination of the style of neuroeconomics, we have come across something illustrative of a novel style of scientific thinking and doing which is in the process of establishing itself.

Hence, this analysis of the style of neuroeconomics has not only furthered our understanding of neuroeconomics, it has also increased our understanding of how and why neuroeconomics and its similarly stylized neuro-endeavors have had the success that they have had.
Moreover, it helps us understand why it is that we trust neuroeconomists. The Fleckian answer to this question is that we trust neuroeconomists because of the large network of linkages they engage in their endeavor, and because of the tradition of thought establishing that when dealing with the question of how humans make decisions, we have to look at the brain for an answer. In order for them to be trusted, then, neuroeconomists do not need to spray their publications with oxytocin.

7.6 Trust at work in and traveling out of the esoteric circle

Taking my cue from Fleck’s quotation on page 184, in this final section I will ponder what it might mean for trust as stylized in neuroeconomics to travel outside the esoteric circle that is its home. After having seen how ideas from the exoteric circle on the localizability of psychological functions inform neuroeconomic practice, this constitutes a further fashion in which Fleck’s suggestion to take into account the multiplicity of collectives can be taken up. Connecting this to the portrayal of science in figure 7.1, it deserves emphasis that this figure represents what is going on in the esoteric circle of a collective. In this final section, I will discuss both how the trust that is construed in the esoteric circle of neuroeconomics travels to the exoteric circle and, to start with, how trust as stylized in neuroeconomics’ esoteric circle depends on the presence therein of trust in the colloquial sense of the word. As I discussed in the opening chapter (section 1.2), the colloquial concept of trust has been articulated by ethnomethodologists. As we saw there, ethnomethodologists consider trust to be a condition of possibility for social order (i.e., for there being social practices at all). Meaningful social life, according to ethnomethodologists, is unimaginable without trust being present. Ethnomethodologists reason that, in any social practice, whoever partakes in that practice must trust other participants to be committed to the practice at hand and to be competent performers. Without trust conceived as such, there simply is no social practice possible, since order would be unattainable.

Looking at the neuroeconomic experiments on trust from this perspective sheds a whole new light on the issue. Building on the concept of colloquial trust thusly articulated, we can say that there is not only and not primarily trust in the experiments performed by neuroeconomists when the first player in a Trust Game sends monetary units to a second player. Trust is not only going in one direction between the two experimental subjects who are playing against each other. In addition to this, and no less significantly, there is a reciprocal instantiation of trust between the scientists who are doing the experiment and the experimental subjects whose behavior and neurophysiology are being investigated.

Ethnomethodologists might argue that what neuroeconomists call trust does not at all capture all there is to trust. For neuroeconomists speak of trust when a first player in the
Trust Game sends money to a second player, and ethnomethodologists would say that this is simply one of a range of possible moves first players are permitted to make in the Trust Game. If first players do something else than display trust as neuroeconomists understand it (i.e., if they do not transfer money to second players), the order of the game does not come to an end. No harm is done to the social practice at hand whatsoever, as the experiment goes through in completely orderly fashion. In other words, when, in the context of the Trust Game, neuroeconomists would say that trust is lacking, ethnomethodologists would argue that this is not the case at all: trust is there and does all the work it always does, enabling the successful performance of the experiment in the first place.

Moreover, when we look at the relationship between the scientists and the experimental subjects enrolled in their experiments, we see trust is vital in various ways. For instance, the scientists trust their subjects to behave “naturally,” i.e., to not to behave in a fashion other than they would outside the context of the experiment, and they have to do so in order to successfully perform their experiments. For that is what it means to be committed to the practice at hand. Simultaneously, the subjects trust the researchers to give them the money which they have been told in advance they can earn during the experiment, and the subjects trust the scientists to take their well-being seriously. Thus, the subjects trust the scientists when they say that they can safely snort oxytocin and enter a fMRI scanner with its huge magnetic field—and we see that the scientists make investments such that subjects will indeed trust them. For instance, the scientists discuss the precautions that are taken to assure the subjects’ wellbeing and make sure health forms are filled out. The scientists, in other words, go a long way toward displaying their trustworthiness to the experimental subjects—and to the end of ensuring that experimental subjects do indeed trust them, again, the scientists do not to resort to spraying the subjects with oxytocin.

Only if there is the type of trust constitutive of social practices that ethnomethodologists care about, can neuroeconomists find out anything about trust as subsequently construed through neuroeconomic experiments. Without the scientists trusting their experimental subjects and vice versa, the experiments would break down. Thus, vital to the design of neuroeconomic experiments is not only a stylized tradition of scientific thinking and doing, which was at the center of attention throughout chapters 4-6; the everyday concept of trust is no less important. Put differently, in brains we trust, but only because of trust in the sense in which it is constitutive of there being social practices in the first place, that is, only because of the presence of trust as articulated by ethnomethodologists, also the esoteric circle of neuroeconomics.

There is no such thing as trust outside the practices in which this concept and the phenomena it stands for plays a role—i.e., there is no such thing as trust understood as something that exists independently from any style. Therefore, it only makes sense to sidestep the pos-
sible allegation from ethnomethodologists that neuroeconomists do not say much about trust at all, since their conception of trust is too constrained. What I want to emphasize, though, is that one concept of trust we see here has its home in the esoteric circle of a laboratory science, but that this concept would never have been arrived at if it were not for the fact that another concept of trust is no less at home in the laboratory than it is in the daily life taking place also outside the laboratory. Put differently, since laboratory science is also a social practice like any other, this too depends for its orderly performance on trust as conceived of and articulated by ethnomethodologists.

If anything, then, the above discussion illustrates the impossibility of making an a priori decision regarding what is “internal” to science and what “external.” For in addition to the whole package of linkages implicated in the style at work in neuroeconomics, the allegedly external—because not strictly speaking distinctively scientific—factor of our colloquial concept of trust also proves to be essential to neuroeconomic investigations of trust, and thus to trust as it is stylized in neuroeconomics.\textsuperscript{11} To understand the relationship between the two conceptions of trust at work here, we only need to realize that, in some respects, what goes on in any circle shows considerable stability. More specifically, in both esoteric and exoteric circles social practices take place, and they all depend for their orderly execution on trust. That this form of trust cannot be recognized in the explicit formulations on trust by neuroeconomists makes no difference to this; the esoteric circle of neuroeconomics differs from other circles in all sorts of ways, but not in this respect.

Having seen that the colloquial notion of trust is present and fulfills its ordinary function also inside the esoteric circle of neuroeconomics, we can now ask whether the trust that neuroeconomists have stylized can travel outside that circle, into the wider landscape surrounding it. With regard to this, it has been shown in chapter\textsuperscript{6} that the trust of neuroeconomists has been exported to other esoteric circles—that it has proven its ability to make the change from epistemic object to technical object. In its capacity of technical object, trust as stylized in neuroeconomics is enrolled in investigations of many other epistemic things. In the context of social neuroscience these include social and emotional maturation\textsuperscript{12} and reputation building.\textsuperscript{11} And in the context of neuropsychiatry these include mental disorders such as social phobia, social anxiety disorder and autism.\textsuperscript{14}

The travels of neuroeconomic trust beyond the confines of the esoteric circle that first occasioned it becomes even more noteworthy if we consider that these need not take it into another esoteric circle. Rather, such travels might also imply that the neuroeconomic concept of trust starts circulating in the exoteric circle. If that were to happen, what would that imply? If we think of one of the contexts often pointed at when describing the importance of trust—the commercial relationship entertained between buyers and sellers—it could mean that building on neuroeconomic insights regarding the role of oxytocin in
trust, sellers would try and win their customer’s trust not by proving to be trustworthy, but by having them inhale, unwittingly of course, airborne exogenously produced oxytocin.\footnote{Politicians, religious leaders or whoever else might want to do so, could do something similar of course.} Indeed, there are already various (online) shops where one can purchase oxytocin sprays and where it is promised that if you use these to spray oxytocin on your clothes, people around you will have more trust in you.\footnote{However, given what we know of how oxytocin works when it is administered directly into the nostrils using a relatively high dosage, there is little reason to think that this type of product will deliver on its promises. We have more reason to think that this is a scam than we have for thinking it is a plausible way of translating scientific results into a profitable business.} The fact that, as of today, neuroeconomic insights have been translated more into quackery than into means of scientific management, of course, does not mean that it is impossible that the successful export of the concept of trust as stylized in neuroeconomics could supersede the colloquial notion of trust. And indeed, as can arguably be gathered from the following excerpt, this is an issue people working in the social sciences consider:

Is neuroscience on the brink of becoming the new science of the social? Did the science of the brain finally find the means to [prove] that sociality is simply a matter of biological and chemical mechanisms in the brain? Or is the current hype in so-called social neurosciences just another attempt to reduce sociality to quantifiable mechanisms? (Matusall 2012)

This fragment is taken from the description of a session devoted to social neuroscience held at a major quadrennial conference for science scholars. We see here that the organizer and chair Svenja Matusall poses the question of whether the autonomy of social science is being encroached upon by social neurosciences, of which neuroeconomics is of course a paradigmatic case. But also, and more significantly, she asks whether social neuroscientists can succeed in proving that sociality is different from what social scientists tend to believe it is: “simply a matter of biological and chemical mechanisms in the brain.”

To tackle this issue, let us once again look at the ethnomethodological concept of trust and juxtapose it with the neuroeconomic one. For ethnomethodology, of course, not only articulates the colloquial concept of trust, it also in itself constitutes an academic field with its own esoteric circle that carries its own style. Its articulation of the colloquial notion of trust, in other words, simultaneously embodies, first, an outcome of research from the confines of an esoteric circle and, second, something belonging to the everyday social life that ethnomethodologists take as their object of research. The discussion above shows not only that “trust” denotes rather different things in the stylizations of both parties, but also that ethnomethodology and neuroeconomics represent conflicting views on how to study
social reality—views implicated in seemingly diverging standpoints on what it means for a phenomenon to be a “social” phenomenon in the first place. Thus we see that with the genesis and development of neuroeconomics, age-old questions concerning the meaning of “social” and the appropriate means of investigating this become topical again.

According to ethnomethodologists, social reality must be understood as a meaningful and ordered reality in which humans always already find themselves living their lives. It consists of rule-governed practices, one of the constitutive rules of which implicates that trust is at the core of human sociality—if it were not for mutual trust, there would be no order and hence no social phenomena for social scientists to engage with. In the view of neuroeconomists, in contrast, we are concerned with social reality simply insofar as people think they are interacting with other people.

If, as Matusall hints, social neurosciences such as neuroeconomics would embody a rigorous neuroreductionism, we could expect that, if the concept of trust we have become acquainted with throughout this dissertation would manage to replace our colloquial concept of trust, this would go hand in glove with a wholesale revision of our social ontology. However, my analysis suggests that, in asking her questions, Matusall raises a false dichotomy between a social science according to which sociality cannot be reduced to biological and chemical mechanisms, on the one hand, and a neuroscience, which is committed to such reduction, on the other. As my stylistic analysis clarifies, neuroeconomics encompasses much beyond neuroreductionism. Indeed, the horizontalist style neuroeconomists carry implies that all sorts of essentialist renderings of human nature lose force, including the one according to which human sociality can be reduced “to quantifiable mechanisms,” to use Matusall’s words. For indeed, while individual areas of the brain are still often pinpointed as the mediator of particular traits, mental states or dispositions, even the analysis of how trust is localized illustrates the importance of the many widely distributed centers and relations that are involved in trust, and engages an understanding of a whole lot more than only these areas taken individually. Today the brain is understood as a hugely complex and ever-changing network. It has intricate, unavoidable and reciprocal connections via its embodiment and via the senses to all sorts of things beyond itself and displays plasticity throughout its life course, changing as it does in relation to the historically variable and ever-changing (social) contexts in which people dwell. Whichever overly individualist and reductionist assumptions are also assumed in the style of neuroeconomics, these should not make us fear that neuroeconomics and its scientific kin will move us into a brave new world. For if the image of the practice of neuroeconomics articulated here reveals one thing, it is that neuroeconomics goes well beyond the neurobiological reductionism feared by so many and admired by even more.