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**Time-Economies in Breast-Cancer-Gene Practices. An Ethnographic Study on “Predictive Medicine” in Germany**

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In my talk I will give some insights into my study on breast cancer gene research, molecular testing and related medical practices. Interviews and participant observation I conducted were mostly carried out in the work group on tumor genetics at the MDC, at the genetical counselling at the Institute for Medicinal Genetics of the Charité University Clinic, and at the gynaecological counselling/early diagnosis for familial breast and ovariancancer at the Interdisciplinary Breast Centre of the Charité University Clinic. Additionally, I also analysed documents and journal articles (german and international) dealing with issues around the breastcancer genes.

What I am showing you today is part of this work. Thereby I focus on – and this is what I would like to show today – time(s) as a fascinating and relevant analytical trace to follow in social science research. First, I just want to say a few words on how I think about time.

And second I will give you two examples of different “time-practices” from my field, followed by some conclusions.

**1. “Theoretical” Localisation**

I come to my first point. When I started to think about time a few years ago I found the following statement of Augustinus, a philosopher and theologian (354-430 AD). He says – or this is what is bequeathed (überliefert):

“Quid est ergo ‘tempus’?” – “What then is time?” And he continued: “If nobody asks me, I know what it is. But if I want to explain it to someone who asks me, I don’t know.”

And this statement describes in a very simple way the problems we are confronted with when thinking about time. Most of the time, we are acting in time, we have a life time (beginning and end), a worldwide standardised time (calendar, time of day) and different institutional times (for example, in school, university, work life). And most of the time we are swimming in a time-stream as if the stream and ourselves are moving and flowing like magic.

**What is not so obvious is, that time is always also *made* and therefore time is social.**

Furthermore time has a second characteristic: **it exists not in singular but always in plural ways.** Every society, every social locus (e. g. an experimental system) is harbouring different time-economies. Think about the particular time of individuals (children, employees, jobless persons), of institutions, of production processes et cetera.

And a third point: **They do not exist apart from each other and they are not equal.** The time of a jobless person or an old person for example is socially rated less worthy than the time of an employee. So times are existing in a hierarchical order – moreover, they order hierarchies.

Finally and belonging to the this: in the case of modern societies it is not possible to speak about time without mentioning the **economic conditions of capitalism** as Wolf-Dieter Narr pointed out in a wonderful article on time and politics (Narr 2003). Think here for example about Benjamin Franklin's well known phrase "Time is money".

So in my talk, I would like to consider concrete working practices on time(s). What can we learn about the creation and re-creation of time-hierarchies, different time-qualities and the effects of these practices?

**Now I will come to the second part.** Of course there is so much to say about the time-issue in respect to cancer genetics and medicine. Especially it could be asked what are the consequences of a future-oriented predictive medicine for example for the "patients"? Or think about the time of the frozen DNAs which might still exist while the person from which it came from is already death. Here I just want to speak about two other time-practices. The first example comes from my analysis of journal articles dealing with breast cancer gene research and it is about "history in making" as an important scientific practice. The second example is from my observations and from my interview material and it is on the topic of interdisciplinary work in the context of molecular testing and related medical practices.

## 2. Examples

The first I will call “history in making” as a genealogical practice.

### 2.1 History in Making!

In the 1980s, while new molecularbiological techniques (for example linkage analysis or PCR) entered the labs, the breast cancer genes moved into the center of scientific desire and thereby the familial breast cancer in form of pedigrees came into the spotlight of researchers in different countries – mainly in the U.S.

Looking at articles on heredity and breastcancer gene research from the 1980s up to now one argumentation is very common: **it says that familial breastcancer is very well known – because *long* known.**

1984 for example Mark Skolnick (one of the prominent figures in this area) wrote:

“Familial clustering of breast cancer has long been recognized” and he continued by listing a lot of names “[Wainwright, 1931; Martynova, 1937; Jacobsen, 1947...]”, and so on. So here the mentioning of a time-line, of its history seems to be relevant to underline the value of the research object “familial breast cancer”.

And there also exists a kind of “**story of origin**” of familial breast cancer in literature; for example in an article of Henry T. Lynch et al. from 2004 we can read: “The first significant description of a pedigree outlining familial breast cancer was published in 1866 by the French surgeon Paul Broca. He traced the causes of death of 38 members of his wife’s family through five generations between 1788 and 1856” (Lynch et al. 2004 : 12).

So what does it mean when a past is linked with today’s genetic practices?

As I said, the emphasis on familial breast cancer as a predestinated, because long and well known object, is not an isolated case in the growing literature on breastcancer (genes) and heredity. **And the question is: “why does this happen?”**

I will suggest that we are dealing here with something I like to define as a “genealogical practice”. Not only in relation to the research object “pedigree” – which by itself is a genealogical practice or a result of a genealogical practice – I think you all know these trees representing family relations.

But also in relation to the scientists themselves. I think what happens here, is the construction or production of a “scientific kinship”. The genealogical link between Broca in the 19<sup>th</sup> century and scientists in the 20<sup>th</sup> and 21<sup>th</sup> century is the **construction of a linear timeline from a past up to a present.**

On one side, contemporary research is embedded in a story of continuity. This charging with time seems to happen in order to strengthen the weight of the scientific project and the familial breast cancer as a “good” research object.

And we should be aware that this kind of history probably is not the history which has happened or in other words: what we can see here is history “in the making”. The production of one’s own history is a process of stabilisation of it. As a genealogical practice this side of inclusion, of continuity is only one side – the other side also emerges in literature:

**It is the side of exclusion, of a break, of a time order in which the past is being separated from the present.** The argumentation here is that in the past and for a long time scientists have tried to conquer the scientific object “breastcancer gene” but they failed and it is up to us (up to the molecular biologists) to conquer it now – and this will be successful!

So we have continuity as well as discontinuity at the same time. As a genealogical practice we do have a history “in the making”; which is more precisely a practice of inclusion and exclusion as well. And the question is, what has been in- and what has been excluded here?

An important separating line was drawn in the late 1970s and 1980, where **genetechnological tools** promised to make the breastcancer gene’s discovery possible.

David Cantor describes this development with the case of Henry T. Lynch.

And I will read this quote, it is a little long but it describes very well what I mean by exclusion:

“In the 1960s and 1970s, Lynch was simply unable to persuade most physicians and geneticists that he had identified a significant hereditary component to human cancer, or that this might provide the basis of a new approach to cancer control. Lynch’s marginal position would not begin to change until the identification of the first cancer genes in the 1990s, when his collection of family histories would become important to molecular work on the genetics of some cancers. After years in the wilderness, Lynch was to see widespread acceptance of the genetic nature of a number of ‘his’ cancers, albeit a genetic nature quite different to that which he had originally imagined. This is not to say that the new geneticists wholly embraced Lynch. It is true that he was eventually honoured with having a number of familial, cancerous syndromes named after him. But suspicions remained that he had bargained his way into the molecular genetic revolution with a resource – extensive family records – that molecular geneticists needed for their studies, but that he did not have the technical skill or scientific

credentials necessary to take such research forward. Some critics also continued – and still continue – to regard his early work on heredity as dubious science. The irony of Lynch is that while he came to be honoured as the one of the ‘fathers’ of cancer genetics, his ‘children’ sometimes quietly questioned his paternity.” (Cantor 2006: 302f.).

What we see here, is a genealogical practice of inclusion (in particular of research materials) but also – and this is striking – an **exklusion of a specific style of thinking and scientific practice**. Locating the cause for breast cancer in a gene, this imagination or assumption fascinated and still fascinates in its simplicity. Of course, there were others as well– more critical scientists who underlined the complex and heterogeneous etiology, the multiple risk factors and so on. But these were more and more marginalised.

So what we find here is a special and very productive time practice in science. A specific past (which is first constructed in the present) has to be included. This practice stabilises the own gene technological present and the development appears as a linear and singular timeline. At the same time specific styles of thinking and practices were excluded. The break in time (old fashioned research approaches in the past and new gene technological approaches in the present) can be understood as a powerful practice to stabilise as well the own position of the new molecular biologists or gene technologists.

So we should from a social science perspective be aware of this “history in making”, the function and the effects of it.

Now I come to my second example.

## **2.2 Interdisciplinary time(s)**

This is about time in interdisciplinarity or the order of interdisciplinary times. I think this is a very interesting point because “inter-” – or “multidisciplinarity” is a key word in the field of new medical practices and of course not only there.

The genetic testing, counselling etc., as I mentioned at the beginning, are part of a interdisciplinary collaboration within a center for familial breast and ovarian cancer in Berlin (which is part of the larger German Consortium).

As you can imagine it has been a great effort for the protagonists to bring all the different loci together – the work groups on tumor genetics, the genetical counselling and so on – and to combine their daily practices in a way that BRCA diagnostics comes to a **smooth operation**. **And here of course, the question of time is a very important one.**

Every locus – the lab, the gyn etc. – harbours a lot of different times. For example in the lab you have the time of the PCR, the time of the DNAsequencing, the time for writing the findings, and so on. In the human genetic counselling you have the time for the counselling itself, when the physician talks with the consulter, the time for writing the summaries of the counselling, etc. And then, we also have the different times of the human and non-human actors as well: the time of the biologists (and here not only their age but also – and this is very important – their contracted working hours. So how long are they in this business – and this question belongs to the question – how many experiences were they able to gain? Then you have the time of the frozen DNA in the lab and so on.

All these times have to be made compatible first, with their coexisting times inside the direct context and second, with all the other times of the other loci. And Niklas Luhman and others have pointed out that in a working context based on division of labour everybody has to know when she or he can expect the contributions of the others.

So the coexisting times have to be brought into a larger choreography.

**Here I will ask now, which time-order was established in this context and how all these different times were brought together?**

As I said, the different disciplines have to work together under the umbrella of a centre for familial breast cancer. This inter- or multidisciplinary approach was an integral part of the whole project from the beginning.

As Pascale Bourret pointed out, the relevance of interdisciplinary collaboration seems to be a “sine qua non for clinical cancer genetics” (Bourret 2005). The “Inter” is being regarded as a very important characteristic in the expanding field of life sciences. And not only there. Interdisciplinarity became a criteria for the funding eligibility of research projects everywhere.

So it is not really astonishing to find something about the importance of interdisciplinarity in my protagonists’ statements.

**This is from the leader of the work group tumor genetics:**

*“I think this is a prime example how work has to be done. Different disciplines are working together in order to succeed.” (Scherneck 2006: 30)*

**Here is a second quote from a biologist who does genetic testing:**

*“I think that working interdisciplinary is very important. [...] I think that in our case the **exchange** is relatively good guaranteed ...” (Gimmel 2006: 24)*

**And this is a quote from a physician who works in genetic counselling:**

*“Normally it makes fun. I like working together with other disciplines, because it is always an **enrichment** for me.” (Spiegel 2006: 45)*

Everybody answered in such a positive way.

But I asked myself what does interdisciplinarity really mean? Does it mean to learn understanding the different ways of understanding, the different “styles of reasoning” of other disciplines? Or does it – from a pragmatic point of view – mean to bring the whole thing into a smooth operation?

So I asked what they really come to know from each other.

And this is what I found.

**Here is an answer from a physician who works in the genetic counseling:**

*“Not much.” (Spiegel 2006: 47)*

**And on the other side the lab answers in the same way: they do not really know what is going on in the counselling.**

*“I didn’t notice anything. Nothing. [...] But this is not so bad, because actually this is not my job.” (Hofmann 2006: 28)*

My impression is that these statements reflect an important point in relation to what interdisciplinarity is or is not. I think this is very interesting when we talk about new interdisciplinary ways of working together – not only in the field of medicine but also in our own disciplinary settings.

Obviously the human actors in my case all accepted the “coming and working together”. But the institutionalised time order does only allow a specific form of interaction: meetings were held to discuss some issues, mainly to optimise the workflow. And interdisciplinarity was successful when everything and everyone became part of a smooth operation: Counselling, pedigree, DNA, Testing, result, medical intervention, early diagnosis. But there is no time at

all to learn more about each other. The single person still operates in the workflow, but she or he will not find enough time to mediate on it.

Of course, one could say that this is not really necessary. Nobody could know everything in such a complex setting including a wide range of medical and molecular knowledges. But isn't it necessary to have the time to learn more about other related disciplines and their daily routines and struggles, to think about one's own work or to put into question the "success" of "genetic medicine"?

Asking the question about time – and I think my example shows this very good – is always a question about order and about hierarchies. For some things there is less or no time than for others. And institutional time orders make it harder or even impossible for the individuals to take their time beside the mainstream.

The time perspective here brings into focus the economic logic of medical practices.

"Time is money" makes sense in this context. Of course, saving time is an important goal. Saving time means saving labour time and thereby costs. And this is why I think that it makes sense to speak about time-economies.

### **3. Conclusion**

I come to a short conclusion.

In the first example I asked what does it mean when a past is linked with today's genetic practices? And I tried to show how and why a specific history is being integrated into contemporary scientific discussions about breast cancer genes. What we see here, is a genealogical practice of inclusion of a past, but also of exclusion of a specific style of thinking – namely an epidemiological one – and belonging scientific practices.

I do not want to say that the history which is presented in the relevant journals never has in some way happened. But I want to draw attention to the point that the production of one's own history is a process of stabilisation which comes along with in- and exclusions. So from a social science perspective we should be aware of this genealogical function of talking about time – talking about the past. And it should be asked critically what other histories were excluded so that we do not make the mistake to tell the same story (and this is normally the powerful one) by the same story.

And now, allow me one more comment in conclusion about the second example:

Haste makes waste! What time strategies does interdisciplinarity need? I think in my example it is very obvious that the power of the institutional time structure in- and excludes different needs for taking time. In daily routines these struggles are not visible. The workflow swallowed some social times in an economic order of time.

No time for generating questions.

No time for asking.

No time for discussion.

When they are not in line with the mainstream. This is the most difficult barrier for alternative time solutions. The institution has to institutionalise alternative time-frames (for example for learning more about the other disciplines). And it seems that without such institutional time-frames it would be not possible to take time beside the economic time order – which structures in a massive way contemporary medicine.

### **Literature:**

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