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A Beginners' Guide to Science

By Carolin Theuring,

Why a guide for beginners?

The idea for this beginners guide came to my mind during a meeting in Munich, Germany, initiated and sponsored by Roger Russell, Ulla Schläfke and Prof. Klaus Schneider in July 2003, where two university professors, Beatrix Vereijken from Norway and Klaus Schneider from Germany, sat down with something like 40 Feldenkrais practitioners to collect ideas for research projects in connection with the Feldenkrais method. So we were discussing and working and everybody was very motivated, but at one point we got suddenly stuck. In this situation it occurred to me that full-time researchers don't know how the ordinary (Feldenkrais) person thinks and the ordinary (Feldenkrais) person has no idea of the thinking of a scientist. To create a little bit more understanding for the Feldenkrais people in this project I pulled out all my notes and books from my research method classes and tried to give a little introduction to them, to facilitate the dialogue with the scientific world we are facing. Now with the IFF Academy Research Journal we again move a little bit forward on this road with collecting and presenting a lot of thoughts and studies about the Feldenkrais Method. It seems to be the right place for this beginners guide to science again, to introduce to basic concepts lying behind the studies.

SCIENCE – RESEARCH - EXPERIMENT- LABORATORIUM these terms usually evoke two completely opposite responses in a gathering of Feldenkrais practitioners: one part turns rather red from rage that someone dares to spoil the Feldenkrais method with measurements, whereas the other part turns rather busy and excited by the thought of studies and experiments and finally a proof that the method really really works.
The folks in between, that stay quiet, are either the habitual sleepers of the group, or really don't care as long as the health insurances start to pay for Feldenkrais sessions NOW, or they are scientists that already entered the field and took a glimpse on the sort of questions lying ahead of us. I will leave open if they are quiet from delight or from frustration, that's the question of half empty or half full and up to the individuals' character.

This little guide attempts to introduce basic lines of contemporary research and is written for someone who has never had any contact with research projects. To keep it short and simple reduces the matter and I leave it to the reader's responsibility to imagine that everything is far more complex (as always).

Why research in the first place?

Science has its own rules and principles, and above all its own terminology with which it is defining itself like every other professional field elsewhere.
These standards may on first sight contradict many of our Feldenkraisian views and thus cause our dislike. However the endeavour to make the Feldenkrais Method measurable does not imply at all that we have to water it down or change our standards, but it does mean that we try to start a dialogue with the leading institutions in society, because like it or not:

Scientific presentation in our society is the basis for being taken seriously by all kinds of institutions, by media, by physicians and politicians, health insurance companies, scientists etc.

Research is done in a lot of fields, e.g. in **social sciences** like psychology, sociology and pedagogy, in **humanities** like philosophy or history and in **natural sciences** like physics, biology or chemistry. There are different research methods, which, according to the field of research and the question at hand, are being applied: **quantitative methods** count and measure more, **qualitative methods** describe more. Both of them strive for increasing knowledge and both of them are relevant for research projects with the Feldenkrais method although they are grounded on a very different base.

Research can be roughly divided into basic research and applied research according to the field of investigation and the question at hand.
Basic research, for instance, takes place in a laboratory that examines how a muscle cell is structured, how memory is organized, or how the biomechanics of a throwing movement can be described in mathematical terms.
Applied research is concerned with questions that rather have a concrete influence on everyday life, e.g. how a medicine affects certain reactions in a cell; how an engine can save energy; or how athletes can learn to optimize their sprint style.

Basic research as well as applied research is important and necessary to gain knowledge about the world we live in, they go hand in hand.

Research is always also influenced by the ***zeitgeist*** and may be slowed down by it, or the opposite, propelled forward. Just remember how long it took to convince the scholars that earth is not flat...but on the other hand look at the incredible fast progress in deciphering the DNA.
Moshe Feldenkrais, with his fascinating ability to think complex and to connect everything, was ahead of his time, and still today science is behind some of his trains of thought (and many scientists behind his abilities). Some of his assumptions though have been proven to be incorrect, or have been even taken further. (Look also Schleip, 2000).

In the following I will introduce quantitative and qualitative research concepts in more detail.

Quantitative research methods

Quantitative research methods claim to measure the subject as exactly as possible – this includes every possible means of measurement: time, weight, size, distance, amount, standardized questionnaires, etc. depending on the question – and the data are analyzed with statistical procedures.
Researchers come up with hypotheses (“*hypothesis”* comes from Greek “*assumption”)* and test their validity through different sorts of investigation, e.g. they design experiments, use questionnaires, stay in a lab, go to a natural environment, etc. depending on their hypothesis and the research that has been done on it before.
Quantitative research is also called empirical research (“*empirical”* comes from Greek “*based on experience”).* The way that hypotheses for an empirical study are formulated follows rules and is crucially different from how our everyday experience is expressed in daily life.

The following table shows you the central differences:

Everyday experience	**Empirical research**
1. The way of turning observations in hypotheses	
Examples for non-scientific hypotheses:	Criteria for scientific hypotheses:
"There are"-sentences (e.g. "There are Feldenkrais lessons that take away back pain.")	General applicability: the statement has to have validity beyond the singular incident. It aims to the possibility of generalization and to show regularities within.
"Can"-sentences (e.g. "With the Feldenkrais method you can make an ordinary golf player a champion")	Expression of a conditional sentence: "If…"-sentences (e.g. "If a mother breast feeds her baby at least 6 months, the child will have less risk for allergies."), or "The… the…"-sentences (e.g. "The longer someone participates in Feldenkrais lessons, the lower he costs for his health insurance.")
Assumptions about objects, characteristics, events, that can neither be experienced directly, nor figured indirectly. (E.g. "The Feldenkrais method makes people happy.") – These statements aren't necessarily wrong, but they are unscientific because they can neither be verified nor falsified!	Potential possibility for falsification: there have to be events thinkable that contradict the conditional sentence. (E.g. -there are obviously children with allergies who were breastfed.)
2. How precise is the terminology used?	
Colloquial information, e.g. "Feldenkrais lessons help people relax. Therefore their back pain disappears." → Lack of precision!	Agreement on the meaning of a selected terminology/vocabulary. - Finding operational definitions for crucial terms: With operational definitions you describe exactly what you mean by using a specific term. Moshe Feldenkrais denied the term "relaxation" because it is used for all sorts of different conditions and not used in a way that allows specifying one condition.
3. How is experience collected and documented?	
Unsystematic to none - or only fragmentary documentation.	Systematic documentation. Attempt to "objectify" - The circumstances under which results emerge have to be described in detail, so that they can be repeated by anybody else under the same conditions. - Research methods help to standardize the experimental procedures

- Complete documentation with comprehensibility down to the detail.
Simply said: everybody everywhere has to be able to understand what you did to get to the results and everybody anywhere should be able to get to the same results as you did, if he follows your conditions.

4. On what basis do you decide to accept or refuse your hypothesis?

Subjective probabilities that are based on your own experiences, or indirect ones gained through other sources.

Use of procedures of statistical reasoning. Intricate attempts to come from random tests to whole populations. Protection against errors through risk calculation (conditional error probability)

5. How do you judge the validity of assertions?

- Proceeding from intuition
- Your view of life
- Your singular experience
- Anecdotic knowledge

- Great scepticism towards generalizing singular experiences
- Demand for results that can be unmistakably interpreted and generalized
- Comprehensive verification

6. How do you deal with theories?

Formation of “naïve theories”, often uncritical, little willingness for falsification

Quality management:
Permanent process of verification and criticism. The future of a theory depends on consensus of the scientific community. Results are published in scientific journals and underlie strict and anonymous review. Furthermore there is an active discourse with colleagues on congresses.
(With of course also the disadvantage of slowing down “revolutions” because new ideas have to be fought through and presented to a very critical community; see “the earth is a disc…”)

The validity and soundness of results of experiments is pinned down on further factors that include internal and external validity:

Internal validity (= logical, correct and valid in itself)

An examination is internally valid when its results can be interpreted unambiguously. Changes in the ‚dependant variables‘ (e.g. the athlete that wants to run faster) have to be clearly attributed to the influence of the ‚independent variables‘ (e.g. a special training program for runners).

External validity (=valid beyond time and people)

External validity is assumed when the results drawn from a study can be generalized to other times, persons and situations.

Qualitative research methods

Qualitative research methods are mostly used in social research (sociology, pedagogy, or psychology). Its foremost claim is not to gain objective results with repeatable measurements, but rather to examine complex social situations or phenomena with techniques and methods that allow and report expressively the participants‘ individuality. Often the researcher goes directly into the field of research, and there is no artificial laboratory situation, yet distinct research methods and techniques do exist, which have been agreed upon to ascertain certain scientific standards.

These include e.g.:

- Single case studies
- Qualitative interviews
- Group situations
- Content analysis
- Participating observation
- Qualitative experiments
- Biographical methods

The Feldenkrais world has already seen the release of papers that make use of qualitative research methods; “The Case Nora” of M. Feldenkrais himself is the best example. Also many other case studies have been published since, e.g. assistant trainer Robbie Ofir wrote two case studies for his PhD in which he describes in detail the rehabilitation with the Feldenkrais Method of two young women both severely brain damaged after car accidents. (Ofir, Feldenkrais Resources)

Qualitative research methods are seen often as less serious tools of the 'soft’ sciences like social sciences or humanities. Nevertheless, they have great legitimacy and provide an important contribution to research because they look into the real conditions, not controllable laboratory conditions which are usually not found in life, and because they can often give impulses as to where detailed studies and measurements could be done. Their aim is to develop hypotheses in a relatively unexplored field and they serve the making of theoretical as well as conceptual prerequisites to be able to put into words first hypotheses in an uncharted territory.

What does all that mean for a Feldenkrais practitioner with interest in doing little research projects?

It means that any question, however small, is important and interesting at that point. In order to go into an actual research process it only matters:

- that everything is documented exactly so that it can be understood by outsiders, or after some time has gone by;
- that, if you want to work empirical, data are being taken with calibrated instruments (e.g. standardized tape measure, stop watch), which does not necessarily mean high

tech (wrapping paper and ink will do for a foot print as much as a computer controlled gait mat!);
- that the questions are reduced. You can explain the creation of the universe with a single examination no more than the Feldenkrais Method (... not sure which one is going to be more difficult anyways...);
- that the terms with which you work are defined exactly. What do I mean if I talk about ‚relaxation'? How do I define that someone has less pain after as compared to before (e.g. with a standardized questionnaire)? What do I mean when somebody after a lesson performs their golf swings more successfully – the score? Better ability to aim? The amplitude of the swing? Etc. (=operationalisation);
- don't worry about statistics! There are computer programs for that, like SPSS, and experts so that you don't have to fight through the numbers alone;
- that you stay in an exchange with colleagues to clarify the terminology, to find a common language and to collect new ideas. Maybe some experiments are not yet ready and talking about it will help overcome difficulties.

Carolin Theuring originally put this Beginner's guide to Science together in German for the participants of the first Feldenkrais & Science meeting in Munich, July 2003. This meeting was initiated and sponsored by the Feldenkrais Zentrum Heidelberg and hosted by Prof.Klaus Schneider at the Military University in Neubiberg.

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Please don't hesitate to send any comments and suggestions or corrections to: c.theuring@email.de

Literature

(Sorry, it's mainly German books, but ask the next college student nearby and you will find out about it in your language.)

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