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Introspection and Discourse in Communication and Upbringing of People of Science – Based on Biographical-Hermeneutic Research

Abstract

In this article I point out the meaning of the introspective research attitude and the discourse in the scientific life of universities, as well as expose a connection between such a personal feature as courage to present one's scientific opinions and the authority of people of science. A systematic but not restrictive discourse constitutes, in the university tradition, a way to intensify the scientific atmosphere, and a passion for discourse – an important distinguishing mark of a scientific personality. Apart from an interpersonal dialogue, the scientists' readiness to carry out long methodological research considerations is supported by their internal talk. This kind of intellectual – spiritual effort together with auto-determination create a specific space for scientists' individual development. The results of the part of the biographical research presented here may be a valuable proposal for bringing up children and the youth in the apotheosis of science and in criticism towards its heritage. Through the parental and scholar reflection over the criteria of students' scientific development – future users and creators of culture – it will be easier to discover a human being's potential not only at universities, but at every level of native education as well.

Key words: *learning, a scientific discovery, scientific development, knowledge of science, introspection, discourse.*

Introduction

Assuming that scientific development is a specific form of learning which leads to a scientific discovery, researching into the essence and regularity of scientific development (forms and methods of upbringing used in families of future scientists, educational and intellectual atmosphere in their homes and schools, preferred values, types of scientific determination) is a crucial task of educational sciences. Getting to know the educational mechanisms of scientific development also constitutes the importance of pedagogy among other sciences and disciplines, such as: sociology of science, psychology of science, philosophy of science, ethics of economics and politics of science. Biographies of scientists, especially their written forms, create an ideal situation to the act of understanding – the basic procedure of all humanities. Hermeneutical understanding is isomorphic with the truth and getting to know "self", and apart from that it is a very important cognitive-emotional process, peculiar methodology, a style of research work, a way of interpersonal communication.

Using the biographical method, I analysed over fifty intellectual profiles of well-known and renowned up till now people of science, scientists from all over the world, representatives of various fields of science. Examining personal documents, such as: letters, diaries, registers, memories, records and notes, and first of all autobiographies and biographies constitute huge research material – a treasury of knowledge of an upbringing process, education and scientific development as well as their most important stimulators. A biography, in my opinion, is a system of facts embracing external vicissitudes, those positively perceived by the surrounding of a given person, whereas an autobiography is first of all a description of internal subjective-objective lot of a human being.

The basic task of pedagogical biographical research is to reconstruct the history of one's life focused especially on the history of one being shaped and following processes of constituting meanings in the past life of their families, schools and other pedagogical institutions. This reconstruction points at differentiated forms of a human being's dealing with everyday life. Biographical research takes a prominent position in the wide spectrum of conceptions and methods of quality research, since they create theories. It also determines a specific way of acquiring and sorting out documents of an individual's vicissitudes, whether being told or related (Kruger, 2003; pp. 77–78).

Using this methodology I am going to answer the question – the main research problem: What are the main activators of a scientific discovery of university research workers during their whole lives?

The connection of personal features such as an ability to carry out a discourse with the authority of people of science proves that another very important feature comes out from the attitude to life which can be characterized by the courage to utter what one believes in and the courage to take up pioneering scientific research – pedagogical and scientific authority of "distinguished" scientists. The authority placed on such solid axiological bases acquires features of longevity.

It is worth stressing what a discourse is and how to understand introspection. A discourse in other words is a talk, a discussion, a speech. In McLaren's critical pedagogy – it is a social relation, in which a language or another system of signs becomes o form of exchange between participants of the relation, whereas introspection means deeper consideration, pondering, deliberation connected with analysis and predicting. It is also an intellectual effort coming from autodetermination directed at self-development. Introspection understood as self-development is thus complementary towards a discourse meaning learning from other people and through relation with them.

A discourse attitude – a way to intensify the scientific atmosphere

Taking up the most crucial discourses of the epoch is a characteristic feature of many distinguished creators of scientific knowledge, just mentioning a long discourse between Immanuel Kant and Christian Garwe concerning connections between theory and practice, Karl Popper's polemic with Schrodinger about characteristic features of life, and Ludwig Boltzman's fight with Ernst Mach on the corpuscular and molecular theory (kinetic theory of gases) in physics. The discourses were carried out in a very lively way not only through a direct exchange of arguments between the intellectuals at conferences, congresses or other scientific meeting, but also through correspondence. The unique significance of the discourses of the scientists in the development of science is stressed by Karl Popper:

I owe Schrodinger a lot: despite all our disputes which sometimes seemed to be the final end of our relation, he always came back to renew our discussions, which were more interesting, or at least more exciting than any other discussion I had with other physicians. We were discussing issues I was working on.The very fact that Schrodinger asked a question "What is life?" in his wonderful book, gave me the courage necessary to ask that question myself, though I tried to avoid questions of "What is …?". I have denied and I still do deny Schrodinger's thesis that preying on negative entropy cannot be a characteristic feature of life (Popper, 1997: p. 192).

An American psychotherapist – Carl Rogers in 1940 was preparing himself to make a speech at the University of Minnesota: the lecture entitled The Latest Conceptions in Psychotherapy was considered to be a birthday of the client-focused therapy. Here is how Kirschenbaum describes that amazing show of Roger's personal and professional courage:

The meeting was presided by Dean Williamson who was a supporter of a directive approach including, among others, the use of psychological tests and giving concrete advice to patients. Rogers delivered his lecture in front of Williamson's students and colleagues. He dedicated its considerable part to criticism of the traditional approaches to the therapy, and was exceptionally harsh towards the practice of giving advice to patients. In order to visualize his thesis he presented a record of an interview made by a therapist giving advice, but without mentioning that the therapist was the chairman of the meeting himself. In other words, Rogers went to the main bastion of directive therapy and carried out a frontal attack on the local theory and psychological practice. Rogers was not prepared for the uproar caused by his lecture. At the same time, it is hard to believe that he did not realize that what he was doing was actually a revolution. The reception given to the lecture – beginning with enthusiastic praises and finishing with aggressive criticism – made Rogers sure that he had said something new, not just made a synthesis of other authors' works. He started writing a new book, which was published in 1942 with the title of "Advisory and Psychotherapy: The Latest Conception in practice". Reactions to the next book were, in many aspects, similar to those aroused by the lecture in Minnesota. For some readers, it was extremely interesting – a lot of students called it "a bible". However, it did not impress a bigger number of psychologists: it was not even reviewed by any serious scientific publishing house. (…) He became a man full of intellectual and emotional energy, of huge innovative passion and an immense fondness for students. His fifth book "About becoming a person" placed him in the centre of attention. When in 1963 he announced his decision to leave the university, he did not need that conventional academic environment any more, which he perceived as restricting and alienating. The outstanding success of "About becoming a person" encouraged him to step onto a more risky path and quit an institution of established reputation. In the newly-founded West Behavioral Institute, he could develop his professional career freely, not being restricted by academic rules, which amazed some of his friends and even members of his family. In 1979 he published "Freedom of learning: a look at what education can be", which was sold in over three hundred thousand copies (Thorne, 2006; pp. 31–33).

Rogers became a great figure of the contemporary psychology mainly thanks to widening the area of his own freedom in the scientific field and thanks to equally

strong sensitivity to other people. Independence and courage to defend one's scientific beliefs are a test of a scientist's authenticity. Autonomy here means an independent attitude towards the extent of good and evil, truth and falsehood, dignity and indignity of acting. An independent person of science accepts personal responsibility for the continuation of chosen humanistic values and for the development of the ethos of science.

A daring presentation of research problems in interactions with other representatives of science gives a communication range and social obligation to scientists' peculiar lot. "Inflexibility" in presenting some intellectual opinion and defending one's own argument despite the pressure from outside, protecting one's enthusiasm for the subject of research from the negative influence of some people, are features indispensable to build charismatic personality, but without any signs of megalomania or autocracy. Courage to fight harm done to people, or standing up against undeserved privileges of people artificially created to be authorities, is part of responsible research workers' virtues of character. A specific sphere of feeling responsibility, e.g. of Stanisław Ossowski, was the righteousness of thinking in a double sense: logical and ethical.

Castoriadis's scientific biography convinces not only his predecessors, but first of all, his contemporary distinguished scientists about an exceptional need to follow intellectual discussions:

Castoriadis's scientific life cannot be called an easy one, not to say a nice one. He did not locate his interests in a safe distance from intellectual battles of his epoch. He never posed as an arrogant observer of reality placed "in high ranks". The thinker's output is characterized by striking continuity, integrity, consequence and aim clarity, and faithfulness to the project of his life. His autonomy as a scientist relied on constant freeing himself from both the power of heteronomical institutions, and autocratic leaders of science (Bauman, Tester, 2003; pp. 52–53).

Finding pleasure in a discourse can also be seen in the personality of Stefan Szuman, who used to invite his students and colleagues to discussions during which he gave them his advice and shared his experiences, lent them his books or scientific materials. He also took an active part, till the end of his life, in discussions held at meetings and congresses of the Polish Psychological Association. Here is how Mrs. Grażyna Makiełło-Jarża remembers Professor Stefan Szuman's lively discursive attitude:

When I began my studies in 1959, Professor Szuman was finishing the last cycle of his lectures. To tell the truth, I listened to his lectures only once. (…) Soon my contacts with Professor became more frequent. Professor and his wife lived on the top floor of a building at 13 Manifestu Lipcowego Street, which also

housed the Faculty of Psychology on the lower floors. The stairs were steep and on their way up they had to take a rest at a landing sitting down on a bench. First we exchanged bows. Later Professor began to start conversations. We ended up with something I like calling "a seminar on the stairs". It was me or my friends who started a conversation. And then we sat down on the stairs opposite Professor. And the seminar was at its full swing. I think that I learned to listen to Professor then and his way of speaking was specific. He was talking to a listener and to himself at the same time. It looked as if while discussing a problem, he was thinking about all "pros and cons". As if he was weaving his way, to sum it up in a simple and convincing way in the end.(…) A couple of my university mates stayed in the department directed by him (Makiełło-Jarża, 1989; pp. 19, 106–107).

Władysław Tatarkiewicz, who was a renowned historian of philosophy, showed his pedagogical talent in, among other things, his didactic work with his students. Originally, Professor's seminars were held in unconventional conditions and aroused common interest. They sometimes took place outside the university: on Castle Mountain, at the cemetery in Rossa, which the youth found exceptionally attractive and which was mentioned by Professor Stanisław Ossowski in his dedication placed in his book given later to Władysław Tatarkiewicz. The social life was flourishing among students' and lecturers' circles. Every week's evening meeting held in one of the lecture rooms gathered not only the academic society, but the inhabitants of the city of Vilnius as well. There used to be some scientific parties at Professor's place (Tatarkiewiczowie, 1998; p. 83).

Knowing the most distinguished figures from the world of science was once a requisite duty for science students who did not want to neglect their own intellectual development. It meant getting to know them personally, a direct contact, though being familiar with their works was also an indispensable element of "the etiquette" of the scientific society. The scientists who I studied (mostly the past ones) declare in their biographies that although in their homes it was not common for the adults to have conversations with children, the young generation had a chance to listen to adults' conversations and freely satisfy their need for a discussion through their school education and contact with their peers.

Authoritativeness of a science authority, one's authenticity, is also expressed in respecting a basic rule of the scientific life, i.e. "unity in variety" and an attitude of good-natured understanding towards young research workers and students. The respect towards a complex process of a human being's development is always a sign of respecting the fundamental humanity of every human being. Stefan Świeżawski, Kazimierz Twardowski's and Kazimierz Adjukiewicz's student, a co-creator of the

Lublin school of philosophy, paid special attention, throughout the whole time of his didactic-scientific activity, to his seminar.

The seminar run similarly to the one run by Kazimierz Twardowski created historical-philosophical abilities of its participants especially through common reading texts and discussion on their interpretation. Świeżawski's seminar, according to its participants, was something more than "a smithy" of scholars specializing in the history of philosophy. It created a specific attitude; it taught the ethos of scientific work, truthful attitude, respect for other people's opinions, an open and tolerant attitude. It made the seminar participants look for he truth, objectivity and will to carry out their scientific-didactic work in the climate of freedom and independence. Świeżawski set high requirements to seminar work, thanks to which their summaries could be placed in a printed form in the volume: "Summaries of doctor, master and seminar theses written at Lublin Catholic University under the supervision of Professor S. Świeżawski and Professor M. Krąpiec" (1956). That volume presents the scientific output achieved at philosophy seminars in the years of 1942–1955 (Czerkawski, Gut, 2006; pp. 10,19).

This kind of education, thought over and arranged in such a way that it arouses not only the cult of knowledge, but respect and love for creators of culture as well, may become an origin of bringing up a scientific individual. Participation in such a unity of intellectual attitudes must have left in the young people's minds the will to pass on those experiences to a wider group of people in the form of creative philosophical discourses or other research work.

Efficiency of the internal speech – the origin of a scientific discovery

Asking oneself very difficult questions, and leaving them in one's own mind for a longer period of time, is also a characteristic feature of the logic of scientific discoveries. Karl Popper reminds of a forgotten thesis of nativism stating that everybody carries an encoded question in their genes for which one seeks an answer through one's life (Gościkowski, Pigoń, 1991; p. 247) as a matter of fact, a scientist who asks an imprecise question to nature, has no way back. The question will bother him/her even when he/she tries to do everything to get rid of it in the mind. There is possibly no other group of people in the world so dedicated to a given issue of science, and so equally competent in this field, and alone in their search.

The verbal process of this life problem is based on, in my opinion, intuitive-volitive and emotional factors. They are followed by an intellectual vision of the

situation. An answer to truths encoded in the genotype concerning existence, admittedly diminishes the area of non-knowledge, however, it does not decrease the area of the secret of a human being's existence.

It also seems that the wider the space of human scientific knowledge is, the more strongly we experience the phenomenon of secrecy. The more we embrace with our cognition, the more the secret sphere of life grows. Discovering the sense of a human being's life is luckily not fully dependent on the progress of science or technology and it is an important factor which motivates scientists to overcome prejudices, stereotypes and wrong opinions of the world.

Some scientists feel that internal dialogue as an addictive pleasure, simple compulsion to have such internal talks and keep their results recorded. The value of science is then realized, in a sense, through awakening of readiness to bear such an intrapersonal effort by people of science.

Introspection as readiness for methodological research considerations

No matter how active a scientist can be, how much one would like to work e.g. in a laboratory, one should find proportional amount of time for meditation. It seems obvious but many research workers pushed by an impulse of hyperactivity do not find time for proper planning of their experiments and analysis of what they have done so far. Overestimating the value of work itself, an enterprising person, who is "deep" in their thoughts, may not feel that they work. It is a big mistake to think that the time devoted to meditation is lost to the culture, because, as some scientists admit (inter alia, Maria Ossowska, Kazimierz Twardowski, Florian Znaniecki) the best ideas appear at the moments of rest, in dreams, while doing the housework, and what is more a good idea may save a lot of hours of strenuous work. There is nothing worse than losing the thread while pondering over something, being very close to formulating a problem or a notion. It is worth taking care of the ability to concentrate your attention and register in a written form, in various life situations, passing thoughts, hypotheses, and research questions which turn up in our mind.

When I want to concentrate, says Hans Selye, I lock myself up in my study and put up a notice "Do not disturb" and switch my phone off. It took a lot of time before that proved to be effective. (…) Let others, who hesitate whether to use such drastic methods of protection or not, use my experience: the laboratory works very well despite my temporary absences. My assistants learn how to make decisions on their own. Even somebody knocking on the door or calling does not feel offended

because they know they should make an appointment first and my secretary simply says that I am out. (…) I am sure that a lot of my professional colleagues will agree with me that finding some time for thinking is the first-rate factor and that there is not such an effort a human being would not make to achieve a satisfactory solution to a scientific problem (Selye, 1967; pp. 155–158).

Bertrand Russell in his "Portraits from Memory", being his autobiography to a high degree, expresses the following opinion on his scientific work:

I respect in myself and others the power of scientific thinking and inquiry, thanks to which we managed to find out everything we know about the world we inhabit. The very thought, if it is authentic, has its own internal morality and forces you to some kind of asceticism. It can also reward: it can bring, at some stage reaching ecstasy, happiness of understanding of what has not been understood so far and putting everything, which has seemed to be a pack of unrelated thoughts so far, in one homogeneous vision. But deep and authentic searching for the truth requires also humility which reminds a bit of obedience to God's will. The desire for knowledge contains an element of humility towards facts; in the sphere of belief it means humility towards the universe. But it does not mean humility towards humanity: a freethinker will not acknowledge the majesty of authority as true knowledge. A freethinker needs independence of both other people and their own prejudices, difficult self-discipline towards traditions and reforms. Impudence of the mind is a sin if one forgets about secrets of life and places one's opinion in opposition to those of the wisest people of many centuries. Learning to think freely we learned to free our thoughts from fear and fanaticism, and the lesson once remembered, bring peace unavailable for somebody who is enslaved. The universe seen through a freethinker's eye has its own ideality and can bring its characteristic happiness (Russell, 1995; pp. 91,65–66).

Natural mechanisms of internal growth – auto-determination combined with introspection may do more good to scientific development of a young scientist than a restrictive or dogmatic discourse, or systematic executing perceptible results a scientist's individual development.

Individual consent to possess dreams – a herald of a scientific talent

A slightly stereotypical conviction became popular in the academic society, i.e. mainly literature and art grow out of dreams, whereas a basic premise for scientific research is "pure" intellect. However, the opinions of the scientists studied by me

clearly point out the revolutionary importance of a different way of thinking: a scientist should be able to afford this kind of authenticity which allows a human being to have dreams and believe they will come true one day. Intellectual agility and life resourcefulness are characteristic of average human beings. Uncommonness of a scientific personality is identified only as a result of a combination of exceptional intellectual and character features in a given person. The initial impulse to carry out scientific analyses and persistence come out of primate dreams; intellect seems to be only "a base" for development of an intellectual and imaginative sphere.

Hans Selye began his big scientific undertaking at the moment when he found himself at the crossroads between something that was safe but common and something risky but still fascinating. He was to make a choice between continuing his work on commonly accepted rules of stress research which his Institute financed and equipped and moving to a new, totally non-researched field of calcifilaxy. The decision was very difficult: it assumed a total transformation of the big Institute (118 people and a couple of hundred thousand dollars), and it was to be made on the ground of a few accidental observations whose charm lay in the fact that they did not match anything known at that time. In Selye's case, sticking to his own dreams decided about starting a serious scientific undertaking, which might have ended as a disaster (Selye, 1967; p. 45).

Stefan Kisielewski's words: "You can act until you have dreams" (Banach, 1996; p. 250) show that a man giving himself in freely to dreams, builds up his own motivational powers which push him towards fulfilling at least a slight part of his dreams. Sticking to dreams only poses a threat that a scientist will remain a teacher and stop his scientific development.

Inconspicuous dreams may in the future become a beginning of a new intellectual movement, great ideas and scientific theories, that is why we should not condemn them as useless, wasting people's time and energy.

A job of an academic teacher – discreet mental and spiritual obstetrics

A university is an institution which, as a rule, should be a leader in bringing up a human being's potential; dynamic development of all intellectual, emotional and spiritual functions through a university is one of the distinguishing features of the academic community. Through mastering differentiated forms of introspection and discourse both scientists and students are able to discover their own potential and determine more accurately the teleological horizon of their own lives.

The potential is a primary law which rules a human being both from outside and inside. Mieczysław Krąpiec describes the potential (ability) as a disposition for an act proportional to itself, pointing out at the same time that being one of the first and basic elements of reality it is indefinable in its exact sense. Potentials included in a human being's nature enable its multi-directional development subordinated to self-determination. Pointing at intellectual and physical potential is the easiest thing to do, but proper academic formation does not stop at developing these functions only. Volitive, spiritual and in every case creative potentials lie in human nature, but the way in which they are updated is up to a given person. Possibilities are "granted" upon us and we do not have any influence on their existence, they do not determine our development because only the subject of these potentials – a human being – can make a decision about which of them and how they will be developed. There might be a situation in which a lack of ability in a field will not allow to achieve high efficiency in a certain part of it. It refers mainly to intellectual and physical efficiency, and to a lesser degree moral efficiency which is weakly dependent on physiological conditions.The potential possesses another aspect – it fills up a human being's insufficiencies through another man's dissimilarity. This aspect plays a very important part in the process of upbringing; it points at the importance of social cooperation through realizing common good (Gałkowski, 1998; pp. 56–57).

Bringing up a human being's potential at a university refers not only to an academic teacher, but students as well. No matter how inborn intellectual and physical dispositions of a group of students are formed, their volitional, emotional and spiritual spheres leave a lot of educational possibilities; an academic teacher, acting wisely within the range of shaping them, may show his/her discreet, almost Socratic pedagogical obstetrics. An ability to awake transgressive tendencies in young people belongs to the most important educational-didactic tasks of a university. Complementarity and independence are two important rules of developing a man's potential and at the same time they are fundamental rules of upbringing. The process of upbringing of a student at a university cannot abstract from them.

Conclusions

Introspection and discourse are very important "springs" of scientific development. Independence and courage to defend one's own beliefs through various forms of verbal communication characterize the authorities of science of all epochs. Letting oneself possess dreams and reluctance to non-reflective activism create

an adequate system of life targets, and they are favourable to proper motivational processes and self-determination.The significance of dreams is worth taking into consideration in the process of bringing a young person up as preparation for methodical research consideration.

Very important early distinguishing features of a scientific talent are not only the need to have an interpersonal discourse carried out in set axiological and cultural frames, but also never-ending readiness for an internal dialogue (intrapersonal) and introspection. The quality of introspection and discourse comes out of scientists' individual attitudes towards fundamental universal values, such as: authenticity, courage, justice and modesty. Non-antagonistic scientific discourse with respect for rules of complementarity and independence as a sign of personal and pedagogical conduct is favourable to achieving spectacular scientific achievements.

Keeping balanced proportions between an introspective research attitude and a passion for discourse determines the dynamics of scientific development of university research workers (it is worth avoiding both an argumentative manner present in the so-called an academic discussion and shortages of arguments or creating discussion panels without students' following specific self-determination development).

A university as an institution founded to discover a human being's potential through mastering various forms of introspection and discourse of tutors and students, cannot only optimize the scientific atmosphere, but create mature axiological scientific personalities.

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