

A window on the theatre of micro-interactions: the Polish psychologist Alina Szemińska at the International Centre of Genetic Epistemology, 1967-1972

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ABSTRACT

The functioning of the Interdisciplinary Centre of Genetic Epistemology (CIEG), created by Piaget in 1955, required the overcoming of obstacles in communication and meetings between actors with diverse backgrounds, training and perspectives. In this respect, it is possible to recognize in the CIEG the deployment of a tacit mode of promoting interactions, within the general framework of a common scientific project. We examine this hypothesis through the case of the Polish psychologist Alina Szemińska, who, after working with Piaget in the 1930s, returned to Geneva in 1967 as a guest researcher of the Centre. Her participation in those years provided us with a window into the socio-interactive aspects of this research culture and, in particular, into what we call the micro-theatre of the interactions of the academic community. Based on unpublished archival documents, we reconstruct this dynamic, focusing on the role played by Szemińska during the period from 1967 to 1972.

Una ventana hacia el teatro de las microinteracciones: la psicóloga polaca Alina Szemińska en el Centro Internacional de Epistemología Genética, 1967-1972

RESUMEN

El funcionamiento interdisciplinario del Centro Internacional de Epistemología Genética (CIEG) creado por Piaget en 1955, exigía la superación de obstáculos en la comunicación y los encuentros entre actores con procedencias, formaciones y perspectivas diversas. Al respecto, es posible reconocer en el CIEG el despliegue de una modalidad tácita de promoción de las interacciones, en el marco general de un proyecto científico común. Abordamos esta hipótesis a través del caso de la psicóloga polaca Alina Szemińska, quien luego de haber trabajado con Piaget en la década de 1930, regresa a Ginebra en 1967, en carácter de investigadora invitada del Centro. Su participación en aquellos años puede ser considerada una ventana hacia los aspectos socio-interactivos de esta cultura de investigación y, en particular, hacia lo que llamamos el micro-teatro de las interacciones de la comunidad académica. En base a documentos de archivo inéditos, reconstruimos aquí esta dinámica, centrándonos en el rol jugado por Szemińska durante el periodo de 1967 a 1972.

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Most of the historical publications related to Jean Piaget's work have focused on his production, whether from the perspective of the history of ideas (Ducret, 1998; Ottavi, 2009; Merete & Ducret, 2010), of reception processes (Parrat-Dayán, 1993; Tryphon, Parrat-Dayán & Volkmann-Raue, 1996; Tau & Yacuzzi, 2016; Van der Veer, 1997, 2008) or of intellectual biographies (Ducret, 1984, 2008; Vidal, 1994, 2000; Perret-Clermont & Barrelet, 1996, etc.), among other alternatives. Here, we explored another aspect of Piaget's work, researching and identifying micro-interactions, institutional strategies and social relations between the involved actors. In other words, we invoke the theatrical metaphor as a resource for the micro-historical analysis of social interaction (Goffman, 1978), even though we know that "neither social reality is literally a theatre, nor do social actors literally play roles" (Villalba, 2010, p. 21, our translation). This is, above all, a *trope*, a way of focusing on roles and shared behavioural expectations. This allowed us to approach a characterization of the *research culture* of the School of Geneva. From this perspective, we were able to show, for example, how Piaget systematically appealed to a kind of *intellectual resilience* that allowed him to collaborate with authors who had initially attacked him (Ratcliff, 2016a); how *intellectual twinning* phenomena took place, as was the case with a representative of the New Education Movement, Roger Cousinet (Ratcliff, 2020), or how systematic networking and social and intellectual recruitment strategies enabled him to obtain the resources needed to establish the International Centre of Genetic Epistemology (Ratcliff, 2019; Ratcliff & Tau, 2018).

It is remarkable that, for some historians, many colleagues of Piaget have remained in the shadows or have simply been remembered under the label of "collaborators". Only Bärbel Inhelder achieved a central visibility in the academic world of Geneva's constructivism. The many tributes and testimonies to her work, the publication of her autobiography (Inhelder, 1989), as well as the work of some historians who restored her specific role as psychologist and methodologist (Tryphon, 1998; Hsueh, 1998; Tryphon & Vonèche, 2001) contributed to this. In contrast, cases such as that of the Polish psychologist Alina Szemińska are known only through fragmentary testimonies. Apart from a few tributes (Bideaud, Meljac & Fisher, 1991) or brief biographies (Narodowy Instytut Audiowizualny, 2019; Journal de Genève, 1979), until a few years ago there were no studies that showed the specificity of her work and her key role in the School of Geneva. More recently, some systematic research (Latała, 2018a), historical works and biographical vignettes on her theoretical contributions and her political career have begun to appear (Golab, 2012; Hofstetter, Ratcliff & Schneuwly, 2012; Volkmann-Raue & Luck, 2014).

With the double aim of contributing to a characterization of her role in the production of the Piagetian work, as well as examining the dynamics of the social interactions promoted at the International

Centre of Genetic Epistemology (CIEG), we will focus on a relatively unknown moment in the intellectual journey of Szemińska. Indeed, it is often mentioned that Szemińska passed through Geneva during the 1930s, when she drew up the lines of what would be her most quoted research on the genesis of numbers and mathematical thought. In fact, her contributions to the development of Piagetian psychology were crucial, long before the existence of a Genevan center concerned with the epistemological discussion. However, here we will focus on her return to Geneva in 1967, where she remained until the summer of 1968 as a guest researcher, coming back sporadically to certain activities of the Centre in the following years. Through a micro-historical reconstruction based on unpublished documents, we will analyse the content of her interventions, as well as the modality of the exchanges with her peers, in a particular setting. In turn, the discussion of this return to the Genevan social tissue opens a window on the micro-theatre of the established interactions, on the social dynamics of the Center, with its tacit and necessary agreements for the interdisciplinary functioning.

Alina Szemińska and her first links with the School of Geneva

Born in 1907 in Warsaw¹, Alina Szemińska was one of Piaget's three main collaborators in the 1930s, along with Bärbel Inhelder and Edith Meyer (Hofstetter, Ratcliff & Schneuwly, 2012; Latała, 2018a). It was at this time that Piaget developed the research program of what became known as genetic structuralism, centered on the research on the construction of physical and logico-mathematical notions: classifications, numbers, quantities, time, space, speed, among others (Ratcliff, 2016b). Szemińska was part of a group of top researchers to whom Piaget delegated fundamental academic tasks: the training of students and the supervision of research based on the clinical-critical method (Ratcliff, 2011; Hofstetter, Ratcliff & Schneuwly, 2012). In 1932 Szemińska obtained her diploma thanks to her study on classification (AIJRR, 1931-1932). After that, she worked as an *ad honorem* assistant at the J.-J. Rousseau Institute and led, together with Piaget, on a research programme on mathematical reasoning (Szemińska, 1935) and the development of the notion of number. This project resulted in the publication, in 1941, of *La genèse du nombre chez l'enfant* (Piaget & Szemińska, 1941), a book that would quickly become a classic in developmental psychology.

But these brilliant academic beginnings did not match well with other events in her life. Indeed, after enrolling in spring 1936 for a doctorate on classification at the University of Geneva, the war forced her to suspend her work and remain confined in Poland from the end of August 1939. As part of the Polish resistance movement to the Nazi occupation, she cooperated with social organizations such as the International Red Cross, until she was imprisoned in *Pawiak* and then deported to the Auschwitz concentration and extermination center, from where she was finally saved after the Russian intervention. Her release allowed her to slowly restart her involvement in Polish academic life and she reconnected with the group in Geneva at a

¹ To review her biography, see Bideaud (1991); Hofstetter, Ratcliff & Schneuwly (2012) and Golab (2012, 2013).

scientific meeting on children's studies held in Zurich in September 1945. At that time, she was working in different fields related to child protection in Warsaw. In particular, through the development of evaluation tools and focusing on the relationship between psychology and pedagogy; in other words, relatively far from her first research project on the genesis of logical-mathematical operations (Szemińska, 1955; 1957).

The fluctuations of the post-war political configuration also left their mark: in 1952 she was forced to make a public self-criticism at the University of Warsaw, where she had to explicitly reject Western theories and thinkers considered bourgeois, including Piaget's (Latała, 2018a-b). However, with the process known as "de-Stalinization", Piaget received an honorary doctorate from the University of Warsaw in 1958. Thanks to this gesture, Szemińska was able to restore the former links with the School of Geneva. As a result, in the mid-1960s, she was invited by Piaget to participate in the activities of a young academic institution: The International Centre of Genetic Epistemology.

A new culture of research in Geneva: The International Center of Genetic Epistemology

Created in Geneva in 1955 thanks to the financial support of the Rockefeller Foundation, the International Center of Genetic Epistemology (CIEG) was a scientific-epistemological pole where researchers from the most diverse areas converged (Ratcliff & Tau, 2018). In this institution directed by Piaget the objective was clear: to investigate the processes of construction of scientific knowledge from a non-speculative perspective (Bronckart, 1980; Dionnet, 1998). It is true that this use of psychology as a foundation for a theory of knowledge is not new in the Piagetian programme. But with this institution, the epistemological dimension acquired both a new scale and a new scope through interdisciplinarity. In the CIEG's foundational writings, *Introduction à l'épistémologie génétique*, Piaget (1950) explicitly pointed out the orientation of the empirical research to ground his epistemology, relying on some key methodological strategies: the reference to psychological research, the clinical-critical and the historical-critical methods—although the latter was only used in a few works by historians and epistemologists who collaborated in the Center, such as Thomas Kuhn, Mario Bunge or Rolando García.

During the three decades of the Centre's existence, a relatively implicit working method was developed, which shaped the research culture of the School of Geneva. Two of its most notable aspects were the interdisciplinarity and the promotion of complementary relationships. Interdiscipline was, from the beginning, a necessary feature that led fruitfully to the use of confrontation as a systematic working strategy (Ratcliff & Burman, 2015). The scientists involved came from different fields, something that demanded a constant effort in communication, in order to clarify and make explicit concepts and theoretical references. In this setting, mathematicians and logicians met linguists, sociologists, biologists and physicists, but also philosophers, epistemologists and historians of science. And, fundamentally, experimental psychologists, whose task was to test,

through the design of experimental situations, the epistemological thesis developed by the specialists of each discipline. The resulting dynamics gave rise to another nodal aspect of this research culture: the *cross-fertilization* of disciplinary, theoretical and empirical expertise. In Bourdieusian words, there was a mix of all those scientist's habitus. This implied that the actors considered the point of view of the peers, without necessarily modifying their perspective, unless the transformation became an epistemic necessity. Thus, within the broad framework of a general epistemological project, the different research traditions and the conceptual references of each disciplinary field found a common ground to produce and catalyse new ideas.

In this scenario, the communicational dimension played a decisive role, since the frequent obstacles did not only concern theoretical issues, but as much the ways of exchanging ideas, the manner in which arguments were presented and the confrontation of different conceptual frameworks (Hofstetter, Ratcliff & Schneuwly, 2012). The search for a common language or fundamental agreements was essential. To this end, Piaget's style of communication seems to have played a key role. In several passages of the transcripts of the institutional meetings one can read the ways in which he "translated" or put into a common language the interventions of the participants. Something similar can be found in the volumes published by the Centre: the chapters, in which the particular research of each contributor were presented, were coordinated and re-read by Piaget in a section of synthesis.

Another of the implicit aspects of the Centre's functioning is evidenced in its dynamics. Cross-fertilization resulted not only from the interaction of researchers representing different fields, but also from the constant replacement of some of them. Each year a different working topic was proposed—for example, the relationship between logic and language, the notion of space or the reflective abstraction. The working instances included regularly a weekly meeting, on Monday mornings, and a symposium, held in June for one week, with the attendance of special guests. This scheme was repeated every year with regular members—such as the psychologist Pierre Gréco or the logician Leo Apostel—, although each edition included new external researchers who were mixed with the local ones. In this way, the social composition was mostly new on each occasion, which led to a changing distribution of the balances between disciplines. In this mutant interdisciplinary framework, it was also necessary to continuously rehabilitate the forms and channels of communication, to guarantee interactions and to achieve the proposed goals. With this new social configuration, very different from that of the 1930s, Alina Szemińska was received on her return to Geneva.

1967-1972: back to Geneva

In February 1966 Piaget included Szemińska on the guest list for the June symposium, but immigration permits were not readily available in Poland. After Polish government authorities systematically blocked her requests to leave the country, Szemińska was finally able to travel to Geneva to attend the symposium in June 1967. A few months later, she returned to Switzerland in October 1967 to remain as a guest

researcher of the Center for one academic year. This stay was followed by other shorter visits in 1969, 1970 and 1972².

At the time of the 1967 visit, the entire CIEG consisted of about 40 people and the symposiums were attended by about 50 participants. That trip was a return to roots which, however, showed significant changes. Almost three decades had passed since the first stay and, during that time, the university and the city had been transformed. International institutions had returned to the country and Geneva was consolidating its pacifist and neutral identity during the Cold War (Fleury, 2005; Hässig, 2005). The Rousseau Institute with its familiar scale—with a maximum of one hundred students in the 1920s and 1930s (Hofstetter, Ratcliff & Schneuwly, 2012)—had been transformed into an Institute of Educational Sciences (ISE). With university status and more than 400 students in the 1960s, it was the heart of intense social agitations. Alina witnessed the events of May 1968 in Geneva, which laid the foundations for a major organizational change: the ISE was converted into a School of Psychology and Educational Sciences in 1969, and then, in 1975, upgraded to the current status of a Faculty of Psychology and Educational Sciences.

In this new environment of the 1960s, Alina's former colleagues coexisted with new ones. Besides Inhelder, at the Centre, she was able to re-encounter Vinh Bang, Nadine Galifret-Granjon, Laurent Pauli, Hermine Sinclair, as well as the psychologists she had met at the Brussels Congress of Psychology in June 1957: François Bresson, Pierre Gréco and Gérard Vergnaud. But it was also a space to meet new philosophers, like Gilles-Gaston Granger and Jules Vuillemin; or physicists, like Francis Halbwachs. There were also guests such as the logicians Jean-Blaise Grize (Neuchâtel) and Ernesto Cantore (Rome), the neurologist Antonio Battro (Buenos Aires), and various researchers from the English-speaking world: Maurice Bélanger (Harvard), Margaret Donaldson (Edinburgh), David Hawkins (Colorado), Hans Furth (Washington), David Bohm (London), Michael Chandler (Berkeley), Gavin Seagram (Canberra), John H. Flavell (Minnesota). Alina also had the opportunity to meet her compatriot, the biologist Czesław Nowiński, and the Russian historian and philosopher Bonifati Kedrov, whom Piaget met in 1954 in Zurich (Rieser, 1955).

Reinforcing her unique position in this context, Szemińska was an exceptional figure. Firstly, because she was Piaget's oldest collaborator, a somehow prestigious position for someone who had mastered methodological techniques since the 1930s and who helped lay the foundations of the Piagetian research programme. Secondly, despite these early ties, she was not part – at least in the same way – of the core group close to Piaget, as were Inhelder, Bang or Sinclair. Finally, strictly speaking, she could belong to both groups that marked the division of work at the Center: that of the “theoreticians”, and that of the “experimentals” whose main function was to invent and design experiments relevant for the exploration of children's knowledge³. Therefore, it seems that she had an exceptional position in the CIEG. In order to clarify the specific role that Szemińska played in this return

to Geneva, we will explore the dynamics of interactions during the year of her arrival.

The 1967 Symposium. Theory and Practice of Interaction in Research

The debates of the CIEG symposia were entirely transcribed in minutes based on stenographic notes currently kept in the Jean Piaget Archives. They contain all the interventions of the participants, to which are added, in an intercalated way, the summaries of the presentations. To read the minutes without knowing their origin, they reflect the structure of a play, with several actors and consistent roles. These documentary sources open a window on the dynamics instituted, on the nature of the exchanges, and make it possible to clarify the role of Szemińska.

The agenda for the 1967 symposium was comparatively dense. Out of the forty participants, a dozen presented experimental results on various aspects of the development of the notion of causality⁴ and six researchers made conceptual synthesis presentations⁵. Following the planned schedule, three experimental and two theoretical presentations were given each day. At the opening, Piaget explained the line of work:

The Center devotes much of its time to experimental and theoretical work. We essentially depend on the guests to make a critique, to give us ideas to move forward, to inspire us⁶.

Causality was the general subject of that year, understood as “the way in which the subject represents an object; it is about the actions of the objects, over each other”⁷. This characterization of causality “in a broad sense” allowed it to be approached from multiple angles. Thus, Battro discussed neurological causality, Halbwachs, the principle of sufficient reason, Bohm, order in physics and Kedrov, causality in philosophy. As for the empirical research for the inquiry of causal thinking in the child, all followed the methodological approach of the Piagetian interview. Moreover, the experiments were designed in a simple way—few materials and without the usual complex apparatus of experimental psychology—, something that was already a mark of identity of the Center. For example, Pierre Gréco presented some experiences on the movement of gears, Catherine Fot, the use of the Archimedes' screw, Pierre Mounoud, a design with spheres that bounce and others that do not, Jacques Vonèche, a device in which a propeller is moved by the heat of a flame. In all cases, the aim was to understand how the child represents and explains causally the changes observed in the physical world. The underlying hypothesis was that the study of the construction processes of children's knowledge sheds light on the

² According to the CIEG's proceedings, she was also present at the 1972, 1978 and 1980 symposia. The photos also show her presence in Geneva in 1976, the year of Piaget's 80th birthday.

³ This social division is mentioned by Jean-Jacques Ducret on a personal communication.

⁴ Gréco, Labarthe, Maier, Mounoud, Vergnaud, Maier, Bang, Bliss, Fot, Munari, Vonèche, Bélanger.

⁵ Hawkins, Bohm, Kedroff, Cantore, Halbwachs and Battro (Céllier did not make the planned presentation).

⁶ Archives Jean Piaget, CIEG 5/2, “Symposium 1967 – Lundi 19 juin 1967: matin – Séance d'ouverture”, Jean Piaget's speech (p. 1).

⁷ Archives Jean Piaget, CIEG 5/2, “Symposium 1967 – Lundi 19, juin 1967: matin – Séance d'ouverture”, Jean Piaget's speech (p. 1).

processes of elaboration of theories on causality in the scientific field. Therefore, in order to design and carry out the clinical experiments it was necessary not only to master the analysis of the proposed task and to know the diverse reactions of children at different levels to be able to intervene effectively, but also to understand the conceptual relationship of all this with epistemological problems.

A common feature of the interventions and discussions around these problems is that they seemed to take place in an atmosphere comfortable for productive confrontation: no one seemed to have any difficulty in expressing themselves or in opposing the arguments of even the most renowned participants. Thus, on several occasions, participants such as Catherine Fot or Pierre Mounoud, rejected Piaget's interpretations or responded to comments by directly opposing⁸. At times, an agreement reached too soon was even seen as a sign of apathy or dysfunction of the system. After Bohm's intervention, for example, Piaget exclaimed: "I'm afraid we are too much in agreement..."⁹. However, this kind of frontality to express discrepancies seemed to occur in a relaxed atmosphere, something that was promoted from the very moment that Piaget issued the invitations to participate in the symposiums, warning that these were "completely informal" meetings (Ratcliff & Tau, 2019). This resembled the Progressive education movement motto: "cheerfully doing serious work" (Bovet 1922, p. 76). In the same vein, Inhelder noted that "there was a studious but cheerful atmosphere" (Inhelder, 1998, p. 162), where fundamental discussions were interspersed with jokes. Indeed, after the lecture on order by the physicist Bohm, Piaget ironically referred to his proverbial office: "Today I learned that disorder does not exist [laughs]"¹⁰. In any case, the interventions were always brief, which seemed to indicate the existence of an implicit rule about economy in the use of words. Under these conditions, it became necessary to abandon all solemnity.

By reading the minutes of these exchanges as if it were a piece of theatre, the unspoken rules are revealed, as well as the characters and their idiosyncratic roles. Not because the interventions were prefigured, but because they reveal a particular and self-organized dynamic that, nevertheless, offers a certain regularity in its plot. For example, Jean-Blaise Grize always appeared diplomatic and subtle, precise and profound. Kedrov seemed to embody a strange mix of Marxist idealism and positivism, while the philosopher Vuillemin was often the one who translated, with the clarity of philosophical language, the conceptual or technical questions of psychology. What was the role of Szemińska here? Undoubtedly, for her it was a partially familiar context, in which she retrieved some of the Rousseau Institute's modes of exchange from the 1930s, although most of the researchers were new. However, her involvement stood out from the beginning: she took part in almost half of the discussions following the presentations (8/18) and reported a broad knowledge of the conceptual aspects of genetic psychology and clinical methodology. In a certain sense, her interventions highlighted the ability to connect the

two significant dimensions that gave the symposium its shape: that of theoretical reflection and that of empirical inquiry. Her reflections, at times aloud reflections, showed a process of searching for solutions and opening up new questions, with a style that frequently led her to propose variations or new designs for experimentation¹¹.

In these dialogues, Alina frequently brought the discussion back to the methodological level. For example, after Piaget's strong intervention on the analysis of the results—"out of 20 subjects, 19 offer nothing, while only the last one can discover the passage to the next [stage]; induction has its risks"—Alina replied that this issue "is important from the methodological point of view". When the subject of the discussion was clearly epistemological, she transformed it into a question of method, sometimes supported by her experiences in Poland¹².

Beyond the emphasis on the methodological details of the research, she did not neglect the conceptual level. In the discussion that followed Bohm's presentation, she intervened to contradict Piaget on the fundamental level. While, for Piaget, "the notion of order is fundamental in the development of intelligence structures and certainly previous to the notion of operation", Szemińska pointed out that "on the psychological level we cannot say that order is fundamental"; to add later: "I wonder if it is justified to ask what is fundamental, to look for something unique that should be the basis of everything"¹³. This is in line with her sharp observations about developmental gaps¹⁴. These confrontations were usually followed by some form of agreement or understanding, a typical mode of Piaget's relationship with its peers¹⁵. Usually, the problems resulting from divergent interpretations led to some new question expressed in the form of an empirical problem to be solved. In turn, her connivance could turn to complicity, and she did not hesitate to question her colleagues with kindness and naturalness. After Bang's presentation on the direction of forces, she summarized the levels of analysis, congratulated the speaker "for this experience that offers us a treasure", and finally warned: "I am surprised by the abstinence of the *Patron*". Piaget's ironic and immediate response was: "abstinence is desirable!".

At this same meeting, a technical debate took place between Szemińska and Bang, and after a discussion by other participants on symmetry, Piaget asked: "in the field of causality, what is the meaning of the notion of group, in the operations attributed to objects?". In the course of his reflection, the notion of "physical group, that is, the one that refers to the relations between objects, independently of what

⁸ As Dionnet pointed out: "the possibility of differences in the interpretation of the experimental situation and the collected behaviours was instituted" (1998, p. 380).

⁹ AJP, CIEG 5/2, "Discussion of Bohm's talk" (p. 1).

¹⁰ AJP, CIEG 5/2, "Discussion of Bohm's talk" (p. 2).

¹¹ AJP, CIEG 5/2, "Discussion of Gréco's talk" (p. 3); « Discussion of Hawkins's talk » (p. 3); "Discussion of Fot's talk" (p. 4); "Discussion of Munari's talk", (pp. 1-2), AJP, CIEG 5/2, "Discussion of Bang's talk" (p. 3).

¹² AJP, CIEG 5/2, "Discussion of Hawkins's talk" (pp. 1-2).

¹³ AJP, CIEG 5/2, "Discussion of Bohm's talk", Piaget's (pp. 2-3) and Szemińska's intervention (p. 3).

¹⁴ Szemińska invoked the reversibility and influence of school education to explain the gaps: "[...] the increasing reversibility of development, as well as the schemes of the higher levels, do not function in a similar way in all situations and the same child can be in different stages depending on the problems to which he or she is exposed". (1965, p. 52).

¹⁵ Regarding the relationship between Piaget and the logician Beth, one of us (Ratcliff, 2016a) showed the role of intellectual resilience that allowed Piaget to collaborate with its theoretical opponents.

the subject has done [...]". From there, Alina introduced the idea of a "common group to both groups (that of the action of the subject and of the objects)"¹⁶, an example of a certain cross-fertilization of ideas at the epistemological level.

In this experience of returning to Geneva, Szemińska displayed all her mastery in various aspects, ranging from psychological research to epistemological problems, including methodology. In addition, she positioned herself as a mediator of the discussions and as a complement to the main actors of the Center. This status yields further insights over the responsibilities that Piaget had given her in the 1930s for the development of the research on number.

One year in the CIEG: 1967-1968

After the symposium in June 1967, the Polish government authorized Szemińska to spend a year in Switzerland at the Center for Epistemology, during the academic period from 1967 to 1968. In October 1967, she landed once again in Geneva to continue her research on causality. This was not a new topic for her. Indeed, in the early 1960s, in order to determine the relationship between mnemonic learning and operational structures¹⁷, she had been working on the causal reasoning in the field of biology and history, with Polish teenagers. Some of these results were presented at the International Conference on Cognitive Development held in 1962

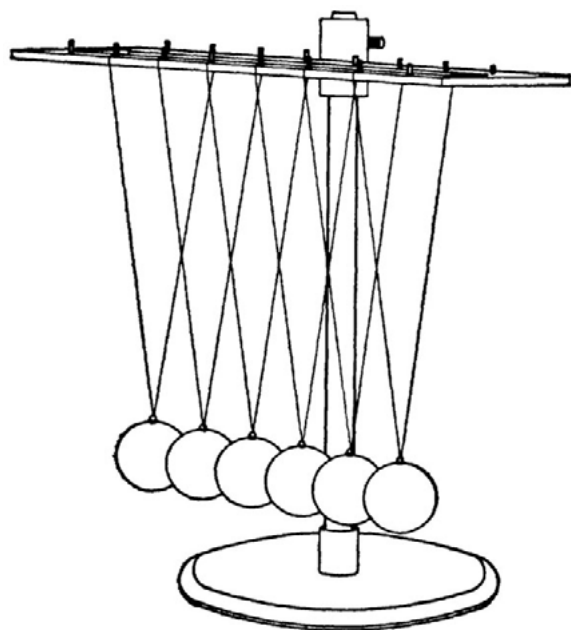


Fig. 1. Newton's pendulum, transformed into an experimental device for the study of children's explanation of physical causes.

in Voksenasen (Oslo), and published later in 1965¹⁸. Following this line, for her work in Geneva she improved an experimental device already used with the Polish population. Using Newton's classic pendulum (fig. 1), she designed an experimental situation adjusted to research with children. In line with the "paradigm of simplicity" which characterized the research of Piaget and the Geneva School in general (Ratcliff, 2006), she developed a simple and ingenious device to explore the notion of force transmission in children.

On the one hand, she modified the pendulum by placing over each string, in a stable order, tapes of different colours to identify each of the 9 balls. On the other hand, the pendulum allowed the addition or removal of balls, by hanging them from the horizontal bar. In this way, the interviews began with a single suspended ball, whose pendular movement had to be explained by the child. Then, balls were added to evaluate the consistency of the child's explanations in each case. Alternatively, all nine balls were suspended and gradually removed until only one was left. These interviews, previously discussed with Piaget, were conducted by Szemińska for one year, with the rotational collaboration of three students. The protocols still preserved in the Jean Piaget Archives¹⁹ belong to 43 subjects aged 5 to 13, from two schools in Geneva.

The documents resulting from the research of Szemińska allow us to examine how the transmission of knowledge was carried out in the School of Geneva. Indeed, she played a pedagogical role, less known, by introducing several junior researchers to the techniques and procedures of the clinical-critical interview. Thus, in the course of this academic year, within the framework of research on causality, she herself conducted the first 14 sessions of interviews in schools, for a total of 33 interviews, leaving the student who accompanied her to observe and record what happened, writing down or stenographing the protocols, and then discussing the transcribed protocols. In these sessions Alina exhibited all the subtleties of dialectical interaction that characterizes the clinical method, counter-arguing and using a whole range of attitudes, postures and classical techniques of this type of clinical interviews. As for recording, there was also a standardized procedure that required practice and a familiarity with the theory, as it was far from being reduced to a simple transcription of answers. The two-column (sometimes three-) interview style of transcription, with questions and answers, but also with notes on the material actions and manipulated objects, should give an account of the dialectic of the approach. From April 30th onwards, the roles were reversed and one of the students began to conduct the interviews while two others recorded, with complete autonomy. It is probable, although there are no records of it, that Alina was present at these sessions, as a supervisor. This didactical scheme of introduction to the method by exemplifying it by way of practice with an expert, has been pointed out by different collaborators as a typical practice of the School of Geneva (Parrat-Dayán, 2019).

Moreover, in addition to the development of this empirical research, during this visit, Alina participated in the Centre's weekly meetings. Although the presentations and debates of these meetings

¹⁶ AJP, CIEG 5/2, "Discussion of Vinh-Bang's talk", Szemińska's intervention (pp. 2-3); Piaget's intervention (pp. 2-5).

¹⁷ Szemińska 1965 (pp. 55-56).

¹⁸ Szemińska 1965, pp. 54-55.

¹⁹ AJP, CIEG 41/1.

were transcribed in stenographic form, they are far from having the level of precision of the symposium's proceedings. Nevertheless, it is possible to reconstruct key moments of the interactions.

The weekly meeting started on Monday, 9th October 1967. On that day, Piaget presented the research plan "essentially focused on the composition of forces and vectors", considered as the core problem of causality²⁰. The next session was devoted to the distribution of work in 23 items, which corresponded almost to the 25 meetings planned. The first presentation, on 30 October, was given by the physicist Rafel Carreras, who dealt with the notion of force in the history of physics. Immediately afterwards, Szemińska presented the data from her first experiments with Newton's pendulum. There, she mentioned one of the classic techniques conceived for the interviews with children: to ask them a drawing of the trajectory of the pendulum balls. The cognitive challenge would lie in "relating the point of return to the point of departure"²¹. Focusing on the subjects' thoughts, the central question was "what notions does the child use to explain the phenomena?". To answer it, she offered some data from two interviews conducted with children aged 6 and 9—in order to show possible differences between ages—, in which several explanations were found regarding weight, height, impulse and obstacles. These clinical vignettes led to an extensive discussion with Joan Bliss and Androula Henriques.

A month later, at the meeting on November 27, Szemińska provided new materials obtained from visits to the schools. Based on interviews with five new subjects, she raised new problems to be considered: the relationship between the child's concepts and explanations, the frequent indistinction between cause and effect, the reactions of subjects at intermediate levels, the nature of the generalization²² and the difference between potential energy and kinetic energy, which allows to distinguish between momentum, weight and speed. Although the available documents are not clear on this subject, everything seems to indicate that through these exchanges and group discussions, the methodological strategies, which had to respond precisely to the theoretical problems, were being redesigned and adjusted.

On several occasions Alina played a central role in the discussions that took place at the Center, highlighting her specific position as "methodological theoretician". In the weekly session in which Pierre Gréco presented his ideas on causal attribution, she objected to the idea of "attribution of operations to a universe superior to that of objects"²³. Additionally, she discussed Grize's formulation in which he compared the INRC group to Klein's group in order to understand the generalization.

The year's activities continued with presentations and real-time discussions about the results achieved. Two presentations were made at the April 29 meeting, one by Robert Maier with Joan Bliss, and the second by Szemińska. Although there are no transcriptions of its contents, it is likely that she presented a text of which there is

now an undated and anonymous typewritten copy, referring to the transmission of the movement²⁴. This 17-page text describes Newton's improved pendulum device and the technique used in the empirical explorations of the previous months. Of the 14 children named in this document, it is possible, by cross-checking with the protocols, to date the experimental sessions of ten of them, which range from November 21, 1967 to February 27, 1968. Furthermore, in the text reports the population referred to 83 subjects, suggesting that the data were collected from other schools that were not reported and that the corresponding protocols were lost or dispersed²⁵. A relevant point of this presentation refers to the analysis of the results. In comparison with the standard theory, Szemińska distinguished "approximately five stages"²⁶ spread between 4 and 13 years of age, instead of the three usual stages of Piagetian testing. This would then be the subject of intense discussions around the complex problem of causality.

Two weeks later, on the morning of 13 May 1968, when the manifestations took place in Paris, the discussions on these issues were resumed. With much more systematic and obviously more thoughtful exchanges, Szemińska identified five modes of child's argument to explain the transmission of movement centred on slope, speed, momentum, weight and energy. In this case, the empirical material came from two different experimental designs: that of the pendulum and another in which a ball rolled on a rail. These materials stimulated the reflection of the next sessions. Consequently, Grize's and Carreras' interventions focused on the notions of parameters and vectors. The following week, Grize distinguished the properties attributed to objects from the parameters applicable to functions. In turn, he developed a model to formalize the explanations of the subjects, from description to deduction. As a corollary to these reflections, Grize wrote the following day a "note on an experiment by Alina Szemińska"²⁷, where he expanded the paper "discussion with Alina Szemińska, Mounoud and Maier".

The fact that the Centre's discussions of the 1967-1968 academic year focused on the intervention of Szemińska, seems to account for the richness of the design and the results presented. Indeed, the stenographic record of the day of its presentation is the most extensive and contrasts with the almost telegraphic and summary versions of other meetings. On the other hand, it was the only presentation that was the object of a complementary note and an attempt at axiomatisation and logical formalisation by Grize.

From debate to publication

At the end of the academic year, during the symposium of June 1968, Alina reinterpreted all her research in terms of factor composition. In her own words, "it is possible to observe a precise succession of

²⁰ AJP, CIEG 3/2, "Séance 9 Octobre 1967. Piaget".

²¹ AJP, CIEG 3/2, "Séance 30 Octobre" (p. 2 back).

²² AJP, CIEG 3/2, "Séance 27 November" (p. 3).

²³ AJP, CIEG 3/2, "Séance 29 Janvier" (p. 1).

²⁴ AJP-DFP A.2.1.4451, "Problème de transmission du mouvement. Tiré d'une recherche concernant le rapport entre énergie potentielle et virtuelle".

²⁵ The four subjects not listed in the protocols could be an indication of this cohort. No Polish names appeared in any of the 14 sample subjects.

²⁶ AJP-DFP A.2.1.4451 (p. 4).

²⁷ AJP, CIEG 11/2, Jean-Blaise Grize, "Note sur une expérience d'Alina Szemińska".

concepts used in the explanations²⁸ of children. According to this interpretation, the explanations found are based on one of these five concepts: shape, speed, momentum, weight and distance. This hypothesis promoted a debate that Piaget raised directly: “Alina proposes 5 stages instead of 3”, stressing that it is necessary to “compare the different researches, in order to decide if the criteria adopted for each of them are general or specific to such designs²⁹. The discussion was focused on how causality is explained by adults and children, a problem on which there seemed to be no quick fix. In this regard, physicist Jean-Marie Souriau acknowledged that “the precise analysis of the phenomenon is extremely difficult³⁰. Other interventions referred to the comparison between geometric and physical factors. Piaget responded to Souriau, without clarifying a position on the division of stages formulated by Szemińska. However, the distinction between five stages was far from irrelevant: eight months later, in a new official letter inviting Szemińska to the 1969 symposium, Piaget wrote:

The results you obtained last year in the area of causality were extremely useful to us and will be the focus of the Symposium discussions. Therefore, it is absolutely indispensable that you be present, especially to develop your very important ideas on the sequence of the five stages that you distinguished in your last paper³¹.

As requested by the letter, at this 1969 symposium, Alina presented in detail her research and the criteria for distinguishing the five levels³², with a view to their clarification.

In the following years, between 1970 and 1972, some of the results of the 1967–1969 projects were published, including four articles based on the interviews on the transmission of force³³, all co-authored with Piaget. These publications, as well as the participation of Szemińska in the regular meetings of those years, consolidated her place as a central author in the Piagetian project.

As Dionnet pointed out, the research culture of the CIEG encouraged a “permanent theorization” (Dionnet, 1998, p. 380). It was not only written and rewritten but conceptually reworked. Along these lines, Piaget read and dissected the numerous protocols to make the most of them and link them to the very general issue of causal thinking. As a result, the distinction of the five stages did not stand up to scrutiny and the publications argued for a three-stage development, albeit with sub-stages. Clearly this was something negotiated with Alina in a position that was intermediate to the intensely discussed interpretations. Indeed, in another typewritten document, signed by Szemińska—probably a letter to Piaget—she referred to the draft of

her 1972 article entitled “The Mediated Transmission of Movement”, and discusses with strong criticism and precision certain arguments used by Piaget³⁴. In the final version³⁵ of the publication Piaget acknowledged Alina’s criticism and the difficulty of the problem: “the distinction between the stage of externally mediated transmission and undifferentiated transmission is not sufficiently clear either in the definition or in the examples”.

This small case illustrates what Dionnet (1998) recognized as “the result of a very long series of interactive reworks” (p. 381).

Conclusion

This partial reconstruction of the exchanges between Szemińska, Piaget and the actors of the Center for Genetic Epistemology shed light on some of the modes of scientific interaction in place in the Geneva group. Although the scale of our observation is limited, the microinteractions of this scientific theatre allow us to identify aspects necessary for the characterization of the typical features of this *research culture*. In other words, of a particular *ethos*, of a series of instituted practices that are produced and reproduced in a given social field, at the scale of micro-interactions.

As far as Szemińska is concerned, we believe it is important to reconsider her participation in Geneva at two equally central moments. After having been one of the pioneers of the research programme in genetic psychology, she was later reintegrated into the Geneva network after overcoming extremely difficult political and human situations. She came out of Auschwitz alive. Quickly readapted to the context of the CIEG, she was able to demonstrate her solvency in essential aspects of the programme, from method to epistemology, from didactics to discussion and writing. But she also showed, from the beginning of her stay, a great capacity to adopt the forms of delegation and mediation that were prevalent in this particular academic culture. Her position was that of a mediator between the different actors, from young collaborators to older ones, from students in training to invited foreign experts.

Now, how can we synthetically characterize the social exchanges within the Center in relation to its functioning? We can now put aside the theatre troupe to specify its rules of communication. The first striking feature is the democratic or *horizontal* aspect of the exchanges between all members, regardless of their status and prestige. The relevant aspect to legitimize any interventions seemed to be the content and not some previous reference nor prestige. On the other hand, frontal discussion was something actively sought, providing it was relevant, a place where freedom of expression endorsed scholarly pertinence. It is certainly possible to pose the question about the origin of this dynamic: is it the Centre, with its particular research culture, that explains the style of the interchanges, or was there already a bias in the profile of the participating scholars that enabled them to confront the “*Patron*”? Both aspects are certainly true, although it is clear that in a context where objections are not

²⁸ AJP, CIEG 5/4, Alina Szemińska, “Rapports entre certains facteurs dans les explications d’un phénomène physique”.

²⁹ AJP-DFP A2.1.4063, “Discussion de l’exposé d’Alina Szemińska” (p. 1).

³⁰ AJP-DFP A2.1.4063, “Discussion de l’exposé d’Alina Szemińska” (p. 2).

³¹ AJP, CIEG 4, copy of a letter from Jean Piaget to Alina Szemińska, (21 February 1969).

³² AJP, CIEG 5/4. Alina Szemińska “De l’explication indifférenciée et qualitative vers l’explication différenciée, quantitative et relationnelle”.

³³ Piaget & Szemińska (1972), Piaget, Szemińska & Ferreiro (1972), Piaget & Szemińska (1973a, 1973b).

³⁴ AJP-DFP A2.1.4450, Alina Szemińska [typewritten fragment] (p. 2).

³⁵ Piaget & Szemińska, “Maybe it’s the track. Maybe the plate moved” (1972, p. 67).

exercised, it is difficult to hear conflicting voices in such a systematic way. And indeed, many divergent voices were heard, at least up to the early 70s in the publication's series edited by the Center: the *Etudes d'épistémologies génétiques*. Confrontations were often read by participants as healthy signs, something that is implied in Piaget's comment "I'm afraid we are too much in agreement". Everything happened as if the acknowledgement of the disagreement was an indicator of the system's capacity—and not just that of one person—to progress collectively. The testimonies of some participants in those meetings (Parrat-Dayan, 2019) also indicated that this openness to disagreement was independent of the status or discipline of the speaker. Furthermore, the minutes of the meetings showed that the main motors for the exchanges were those points on which there were contradictory interpretations. In this respect, it seems that it was this dynamic of the CIEG—oriented by its founder—that contributed to the development of an interdisciplinary culture. The established practices *required* the typical dissonances that occur in the encounters of heterogeneous conceptual frameworks. And for these encounters to be productive, horizontality and cooperation, beyond hierarchical academic protocols, must be guaranteed by a social device.

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