Studi di estetica, anno XLVII, IV serie, 1/2019
ISSN 0585-4733, ISSN digitale 1825-8646, DOI 10.7413/18258646077

Annamaria Contini[1]

Nelson Goodman and Project Zero: art, cognition, and education

Abstract
In 1967, Nelson Goodman founded Project Zero, a program of basic research into art education, which, even today, is an international reference point. This article reviews the relationships between the theses set out in Languages of art *and the most original results obtained by Project Zero between 1967 and 1971, when Goodman was the director. Thus emerges the role of general symbol theory in developing an educational approach that attempts to overcome the dichotomy between art and science, between the emotive and the cognitive. The article also analyzes the effects of Goodman's participation in Project Zero on his aesthetic-philosophical reflections, using it to interpret both the exemplar function taken on by art in* Ways of worldmaking*, and the emergence of new concepts such as that of "implementation".*

Keywords
Art education, Symbol systems, Understanding

1. *A basic investigation into art education*

In 1967, several months before publishing *Languages of art*[2], Nelson Goodman founded "Project Zero", a program of basic research into education for the arts, at the Harvard Graduate School of Education. The founding team was made up of Goodman himself, who served as the director for four years, and two young research assistants who would later become famous for their work in the field of education: Howard Gardner and David Perkins, then graduate students at Har-

[1] annamaria.contini@unimore.it.

[2] We remind the reader that the theses presented in *Languages of art* had already been written by the author in the early 1960s; as we will see, the theory of symbols set out in this book is the theoretical basis of Project Zero.

vard and MIT, respectively[3]. Scholars from a variety of fields also worked on the project, with various roles: musicologist Jeanne Bamberger, educator Frank Dent, philosopher of education Vernon Howard, psychologists John Kennedy and Paul Kolers, literary analyst Barbara Leondar, and many more. Certain members of the Harvard faculty, such as Jerome Bruner and Israel Scheffler, also provided support and contributions. It was thus a decidedly multidisciplinary team; moreover, under Goodman's leadership, Project Zero focused on the nature of artistic knowledge and the advancement of the arts through the improvement of education in terms of both understanding and production.

The choice of the name "Project Zero" reflected the founder's belief that, in comparison to education in other fields, education in the arts was sparse, sporadic, and chaotic. Although there were many good teachers, there was no systematic and communicable knowledge about arts education:

> We began near zero (hence our name) with little more than a conviction of the importance of the task and some tentative notions as to where to direct our attention first. Bits of evidence, conjectures, apparently remote studies, perplexing questions, have come gradually to relate to and illuminate each other. These have suggested news hypotheses and lines of thought that have in turn brought to bear the results of other, often apparently remote, studies. (Goodman *et al*. 1972: 1, Goodman 1984: 151)

Goodman's interest in the world of art had deep roots. During his undergraduate years at Harvard College, he began studies in the practical and theoretical aspects of art with Paul Sachs, the Associate Director of the Fogg Art Museum at that time. From 1928 (that is to say, immediately after his graduation) to 1941, Goodman was Director of the Walker-Goodman Art Gallery in Copley Square, Boston. There, he met his future wife, Katharine Sturgis, who was a fairly well-known visual artist. In these same years, he began to collect art objects, a passion that continued throughout his life; his private art collection became so vast as to include works from various historical and geographical sources: seventeenth century old master paintings,

[3] Gardner, after a PhD in Development Psychology (1971), developed his theory of multiple intelligences; Perkins, after earning a PhD in Mathematics and Artificial Intelligence (1970), wrote highly influential texts on the nature of creativity.

modern art from Picasso to Demuth, ancient Asian sculptures, Native American arts, etc. (see Carter 2000). Also starting in 1928, Goodman began his PhD under the supervision of C.I. Lewis, the founder of a conceptual pragmatism that combined influences from logical positivism with the pragmatism of Peirce, William James, and John Dewey. Goodman finished his PhD in 1941 with the thesis *A study of qualities*, in which he – in partial continuity with Carnap ([1928] 1961) – developed an original form of nominalism. The delay in obtaining his PhD was caused by the extensive effort he put into managing the Art Gallery and other related activities. In fact, for many years, Goodman would constantly be travelling between the art world and the world of logic and epistemology. After military service during World War II, he chose the academic life and taught at the University of Pennsylvania and Brandeis University before returning to Harvard in 1968 (see Cohnitz, Rossberg 2006: 1-27). However, 1968 was also the year in which Goodman published *Languages of art*, the book that reconnected his interest in the arts with his inquiries into the theory of knowledge: "All my life has been lived in the arts and in philosophy, but it was only very late in 1968, that I ever wrote anything combining the two. I had become increasingly aware that the revelation we get from science (I am talking about theoretical science) and the revelation we get from art are very much alike" (Goodman 1984: 192).

Howard Gardner (2000) has observed that Project Zero would never have been born if it had not been for the concatenation of three factors. He suggests that the first of these was the publication of *Languages of art*, in which the study of different symbol systems become the basis for a reflection on art whose value increases as it opens itself to contributions from other disciplines. A second factor was drawn from the atmosphere in education in the 1960s. After the blow that was the launching of Sputnik (the first artificial satellite in history) by the Soviets in 1967, the United States had begun to reform the education system in order to emphasize the teaching of mathematical and scientific subjects at the expense of the arts and humanities. By the mid-1960s, awareness of the necessity of correcting this asymmetry at least somewhat had grown, and both public and private institutes were willing to finance investigations into art education. Gardner also cites more particular circumstances: Theodor Sizer, the Dean of the Harvard Graduate School of Education, had received funds to foster research and pedagogy in the arts and, perhaps

on the recommendation of Israel Scheffler, invited Goodman, who was already considering leaving Brandeis University, to head the program. "Equipped with a little budget and a lot of lively ideas, Goodman launched an unprecedented research project that has lasted, indeed prospered, until today" (Gardner 2000: 246).

However, despite Goodman's wide-ranging bibliography, there are few works whose aim was to better understand the significance of his participation in Project Zero. In the following pages, we will, first of all, try to reconstruct the theoretical connection between *Languages of art* and Project Zero; we will ask ourselves what this program's principal contributions were to the analysis of both theoretical and methodological problems of art education during the years when Goodman was its director; finally, we will consider what effects this foray into art education may have had on Goodman's philosophy.

2. *From* Languages of art *to Project Zero*

In the introduction of *Languages of art*, Goodman warns the reader not to be misled by the book's title: problems concerning the arts – he writes – are a "point of departure rather than of convergence. The objective is an approach to a general theory of symbols". Goodman specifies that the word *symbol* will be used "as a very general and colorless term" that can be applied to "words, texts, pictures, diagrams, maps, models, and more" (Goodman 1968: XI). A symbol is anything that stands for something; as a result, the investigation will touch upon questions concerning not only art, but also the sciences, technology, perception, and practice.

However, this does not mean that the question of art is of little relevance. Rather, as is demonstrated clearly throughout the volume, Goodman's objective is to free art from the ghetto of its presumed autonomy: instead of isolating elements or characteristics that would define art, he intends to study it in the context of a systematic inquiry into the varieties and functions of symbols that includes both verbal and non-verbal symbol systems, "from pictorial representation on the one hand to musical intonation on the other". Better understanding of the field of art requires a comparison with other fields; only within a general theory of symbols is it possible to reassert the cognitive value of art, without reducing it to an emotive fact. Reciprocally, only

a non "insular" concept of art can dissolve the dichotomy between the cognitive and the emotive that makes it impossible to seize "the modes and means of reference and their varied and pervasive use in the operations of the understanding" comprehensively enough (Goodman 1968: XI).

Consistently with this project, in *Languages of art*, Goodman put into action a double strategy. On one side, he developed a topography of the many forms of referential practices: denotation and exemplification (samples and labels), description and representation (verbal and non-verbal symbols), possession and expression (literal and metaphorical) are all differentiated, but as various articulations or, as he would later say, "routes of reference" (Goodman 1984: 55). For example, painted representation can be considered a special case of denotation: in order to represent an object, a painting must not resemble it, but rather be a symbol of it, that is, mean it, refer to it. On the other hand, the distinction between denotation and exemplification is related to the orientation of the reference: while denotation moves from the symbol towards the thing (like the word "red", which denotes the color red), exemplification moves from the thing towards the symbol (as in the case of a tailor's fabric sample, which exemplifies a few properties of the fabric in question: color, texture, weave, pattern). On the other hand, Goodman develops a type of symbol system based on the five requirements of the notational systems: unambiguity, syntactic and semantic disjointedness, and differentiation. The result is a classification that makes it possible to compare the various symbolization systems used in art, science, and life in general: from clocks to counters, from diagrams to maps models, from musical scores to painters' sketches and scripts (intended in a broad sense as the characters of natural languages). A linguistic system, whether notational or not, satisfies at least the syntactic requirements of disjointedness and differentiation; representation is distinguished from description not because it is "iconic" (that is, more similar to what it denotes and therefore less arbitrary), but rather because of the absence of syntactic articulation and the resulting density of the symbol scheme. Signs do not have "intrinsic" properties, but a thing serves as a sign only in relation to a symbol system.

In the last chapter of *Languages of art*, entitled *Art and understanding*, the overall articulation now taken up by general symbol theories leads us to rethink the aesthetic experience, recognizing that for it, it is necessary to "make delicate discriminations and discern

subtle relationships": all artistic forms (painting, sculpture, music, poetry, dance, architecture, etc.) constitute a symbol system, each with its own peculiarities, and yet, they can be associated with other artistic forms and types of symbolic systems. Additionally, the aesthetic attitude cannot be reduced to passive contemplation without contextualization: "The aesthetic 'attitude' is restless, searching, testing – is less attitude than action: creation and re-creation" (Goodman 1968: 241-2). Like science, art is a way of understanding the world, that is, of operating with symbol systems to build a certain "vision" of the world. In fact, the relationship between symbols and facts or empirical data is never objective and unequivocal: it is this way neither in art, where innumerable ways of representing or describing the same object exist, nor in science, whose symbol systems contribute to making up the objects that we propose to know. At this point, the problem is to understand what distinguishes aesthetic activity from other intelligent behaviors, especially scientific research.

In order to try to answer this question, Goodman reviews several distinctive traits usually attributed to art and the aesthetic experience: the absence of a practical end, the presence of pleasure or satisfaction, the prevalence of a sentimental and emotional dimension. In his opinion, none of these traits are adequately justified; not even the role played by emotion seems clear, because the dichotomy between cognitive and emotive prevents us from "seeing that in the aesthetic experience, the *emotions function cognitively*", representing a tool to discern what properties a work possesses and expresses. Sustaining this, warns Goodman, does not mean falling back into an abstract intellectualism: emotions must be felt in order to take part in cognition. Their cognitive use, if anything "involves discriminating and relating them in order to gauge and grasp the work and integrate it with the rest of our experience and the world" (Goodman 1968: 248). In the aesthetic experience, emotions are not erased, but rather altered. Furthermore, emotions function cognitively "not as separate items but in combination with one another and with other means of knowing" (Goodman 1968: 249) such as perception and conceptualization.

However, even after having clarified the role of emotion, we do not have a criterion to distinguish the aesthetic experience from all the others. Instead of insisting upon searching for this criterion, Goodman formulates his famous theory of the "symptoms of the aesthetic", with which, abandoning the pretense of defining once and for

all *what* an aesthetic fact *is*, he searches for its recurring aspects, the characteristics that "tend to be present rather than absent, and to be prominent in aesthetic experience" (Goodman 1968: 254), even if they are neither a necessary nor sufficient condition. In fact, the task of these symptoms – syntactic density, semantic density, syntactic repleteness, exemplification – is not so much to clearly demarcate the aesthetic from the non-aesthetic, but rather to enable a better comprehension of the aesthetic functioning of signs (see Marchetti 2006: 93). In this way, we could avoid mistaking density for ineffability with its unsatisfied need for absolute precision, and for immediate exemplification with its characteristic of correlating a symbol to a reference by designating a property that is possessed. As revealed by the irrelevance conferred to the question of aesthetic value and the related possibility of determining what is beautiful and what is ugly, the essential objective is to reaffirm the cognitive goal of symbolization: the aesthetic experience is a form of comprehension, and, as such, its excellence depends on its cognitive efficacy. Again, this does not mean excluding the emotive aspect: "what we know through art is felt in our bones and nerves and muscles as well as grasped by our minds, that all the sensitivity and responsiveness of the organism participates in the invention and interpretation of symbols" (Goodman 1968: 259). It is, rather, to eliminate the gap between the scientific and the aesthetic, showing that truth is not a prerogative of science, an objective that opposes science to art; in both fields, truth is, albeit in different ways, a matter of fit – of a theory to facts and of facts to the theory: "Truth and its aesthetic counterpart amount to appropriateness under different names" (Goodman 1968: 264).

In conclusion, there is a deep unity between art and science, which diverge significantly only through the predominance of certain characteristics specific to their respective symbols. On the last page of *Languages of art*, Goodman acknowledges the possible fallout of this conceptual framework in the areas of psychology and pedagogy:

> Once the arts and sciences are seen to involve working with – inventing, applying, reading, transforming, manipulating – symbol systems that agree and differ in certain specific ways, we can perhaps undertake pointed psychological investigation of how the pertinent skills inhibit or enhance one another, and the outcome might well call for changes in educational technology. Our preliminary study suggests, for example, that some processes requisite for a science are less akin to each other than to some requisite for an art. But let us forego foregone conclusions. Firm and usable results are as far off as bad-

ly needed; and the time has come in this field for the false truism and the plangent platitude to give way to the elementary experiment and the hesitant hypothesis. (Goodman 1968: 265)

Languages of art thus ends by building a bridge towards a new investigational objective. The "epistemic turn" in aesthetics does not remain a mere theoretical instance, but rather finds a field of application and further elaboration in a research centered on education for the arts.

3. *Project Zero's aims and results during "Goodman's era"*

In 1972, Goodman, together with Howard Gardner and David Perkins, oversaw a Final Report for the United States Office of Education, which had financed the first years of Project Zero. Entitled *Basic abilities required for understanding and creation in the arts*[4], this report illustrates the theoretical paradigm upon which Project Zero is based, examining the experimental investigations and conceptual studies carried out, and outlines a balance of the results achieved to that point.

The Final Report begins by declaring the aims of the Project: the "advancement of the arts through improved education of artists, audiences, and management". It is immediately clear that art education is meant in the broad sense, both because it is not limited to what is taught in schools, and because it includes the processes and human abilities implicated both in the production and comprehension of the arts. Goodman and his collaborators warn that they are not looking for "mathematical formulas for nurturing abilities in the arts", but rather "various possible ways that education may be made more useful – or at least less damaging – to such abilities" (Goodman *et al*. 1972: 1, Goodman 1984: 150-1). This clarification is necessary, because it

[4] Despite its great interest, this 100-page Final Report has remained unpublished, even if scholars interested in reading it could have asked for a hard copy from Harvard Project Zero, as today they can download it online; only several paragraphs of the first and seventh chapter – probably those written by Goodman alone – were published in *Of mind and other matters* (Goodman 1984: 150-67). When possible, we will refer to both texts; references only to the Final Report mean that the passage belongs to a yet unpublished section.

defuses the conviction that this type of research would destroy art in the end, as any analysis or educational investigation, or even education itself would be antithesis of art. The Report therefore preemptively discusses the "collection of popular prejudices and philosophical fallacies concerning the arts, education, and even research methodology" (Goodman *et al*. 1972: 4, Goodman 1984: 153), also considering oppositions and obstacles to any attempt to impose rigorous terms to the question.

The most frequent misconception is that of seeing art as an area of experiences, emotions, and immediate values, and seeing science, by contrast, as an area of inferences, cognition, and facts. This derives from the epistemological dichotomy, now considered as antiquated as it is unsustainable: "data" or the immediate versus that which is the fruit of inference, or mediate; the emotive versus the cognitive. "The conclusion is drawn either that the arts are unteachable or that methods for teaching immediate awareness, feeling, and appreciation must be sought". Challenging such a conclusion, Goodman and his collaborators invite us to consider how it would be advantageous for any research on the topic to recognize that "the distinction between mediate and immediate experience may be illusory, that the emotions rather than being antithetical to cognition may be instruments of it, and that appreciation may be as subsidiary to understanding in the arts as in the sciences" (Goodman *et al*. 1972: 4-5, Goodman 1984: 153). On the other hand, a serious study of education in the arts is also led astray by two opinions that are opposites of each other, but equally damaging: one according to which the arts would merely be "instruments of entertainment", and another according to which the arts would be belong to a "plane far above most human activities, accessible only to an élite". A further misunderstanding is created by confusing the problem of artistic education with the problem of creativity: "Ways of discovering and fostering originality, superior talent, and genius are surely wanted for the arts; but no more so than for the technologies and sciences". The authors of the Report also criticize the romantic identification of art with the genius of an inspiration that blooms unexpectedly in the mind of an artist, and, requires neither techniques nor methodologies in order to become concrete. They, in fact, sustain that "realization, whether in physics or painting, in medicine or music, is normally an arduous process, straining skill and pertinacity" (Goodman *et al*. 1972: 5, Goodman 1984: 154-5). One can be taught to produce art, although the

teaching must be made up of multiple methods: practice, apprenticeship, demonstration, collaborative assistance, etc.

There is, however, also an obstacle that has its roots in a real difficulty: the absence of clear and reliable parameters for evaluating the quality of the works produced make it quite problematic to evaluate art education programs. However, the search for general and shareable principles to guide such evaluation must not be abandoned. Among them, the choice of judging education programs "less in the light of aesthetic standards applied to the ultimate results than in the light of what we can discover concerning the functioning of human beings, the nature of the processes involved in various phases of the production and understanding of works in the several arts, and way of fostering abilities to carry out those processes" (Goodman *et al*. 1972: 77, Goodman 1984: 164) stands out. In other words, it is necessary to shift attention from the results to the processes, evaluating the means with which the various education programs develop the abilities and competencies that favor the production and comprehension of art.

The reconstruction of the theoretical framework follows, the theory of symbols exposed in *Languages of art*, which takes on a crucial role in many points of view: it makes it possible to overcome the dichotomy between art and science, between the emotive and the cognitive; it indicates that creation and artistic comprehension are not the fruits of pure inspiration or passive contemplation, but that they involve active and constructive processes; it offers the basis for analyzing similarities and differences between symbol systems, and therefore, for comparing, distinguishing, and interrelating tasks of many kinds, as well as abilities involved in dealing with these tasks. Such a theory acquires relevance even for the purposes of empirical research: "By identifying the kinds of symbol systems involved in a given phase of a particular artistic activity, we have gained some clues as to the skills required as well as to ways of discerning and developing those skills" (Goodman *et al*. 1972: 1-2, Goodman 1984: 152).

The theory of symbols presents undoubted affinities with the cognitively-oriented psychology that was asserting itself in those years, and whose solicitations Project Zero accepted (for example, the view of the human perceiver as an active, constructive organism) when it had not yet penetrated in the area of education, and was seen as suspicious in arts education. After all, most research activities synthesized in the Report dealt with psychological-pedagogical questions. At

times, theoretical nuclei of *Languages of art* – such as the difference between linguistic and nonlinguistic symbols – were declined in a new way, with possible correlations in human neurological functioning.[5] Entire chapters then presented accounts of studies and experiments of perceptual functions involved in artistic production and comprehension: studies of the perception of pictures, ranging from line drawings to caricature and to tactile-perceived pictures; studies of the perception of music, with particular attention to the role of rhythm as an organizing force in human development and to children's invention and/or learning of rhythm notation; developmental investigations of children's sensitivity to painting, literary and musical styles; analysis of the nature of problem-solving in different aesthetic media. Regarding arts education more specifically, the Report introduces a taxonomy of methods of education and describes various initiatives: the site-visits to institutions of art education, the sponsoring of lecture-performances, the start of a training program in arts management, and the launching of a course based on Project Zero.

In summary, what were the results of the first years of Project Zero? In what measure did Goodman and his collaborators succeed in identifying the basic abilities employed in the creation and understanding of arts? Did they fulfill the Project's aims at least in part, that is, the "advancement of the arts through improved education of artists, audiences, and management"?

Even if the Final Report insists on the non-marginal space given to empirical research, it is certain that the main results of Project Zero in "Goodman's era" were theoretical in nature. This does not mean that they do not contribute to the definition of the specific abilities required in art: a project that starts almost at zero must necessarily first confront "basic theoretical studies into the nature of art and of education and a critical scrutiny of elementary concepts and prevalent assumptions and question" (Goodman 1989: 1); furthermore, only based on an adequate conceptual corpus is it possible to formulate hypotheses "about ways of fostering particular skill or about how improvement in a given skill may enhance or inhibit another" (Goodman 1984: 149). We therefore see what the most relevant theoretical results are from this point of view.

[5] Project Zero has pioneered in the study of cortical representation of different artistic symbolic skills (see Gardner, Winner 1981).

1) "Production and understanding in the arts involve human activities that, though they differ in specific ways among themselves and from other activities, are nevertheless generically related to perception, scientific inquiry, and other cognitive activity" (Goodman *et al.* 1972: 81). On one hand, research regarding didactics in the arts tends to cross over into a more general study of how human beings learn, discover, and understand; on the other hand, arts education appears "as a requisite and integrated component of the entire educational process" (Goodman 1989: 1).

2) If work in the arts, like much human activity, entails the processing of symbols, then arts education can be viewed as "the imparting of literacy skills in the area of artistic symbolization". In other words, "a focus on artistic symbolization makes it possible to demystify artistic processes" (Gardner 1989: 158-9), redefining the role of mystery and inspiration. Education for the arts will consist of "discovering or inculcating and fostering the abilities appropriate to the specific activities involved" (Goodman *et al.* 1972: 81). At the same time, this approach will avoid leading to confusion and error, like the frequent insistence of many teachers on the contrast between the verbal and the visual. In fact, characterizing the difference between poetry and painting, between verbal and non-verbal, in terms of "verbal" and "visual" means ignoring the fact that the verbal is often visual (for example, in reading) and that the non-visual (for example, in hearing) is often non-verbal (Goodman *et al.* 1972: 7, Goodman 1984: 156).

3) "Creativity is neither peculiar to the arts nor the sole or comprehensive concern of education for the arts" (Goodman *et al.* 1972: 81). Exclusive attention to creativity has often obscured the importance of the several skills that creation in art must employ and the existence of connections between scientific and artistic activities. Vice versa, if we admit that many tasks in the arts, like many in science, imply the processing of symbols, we also admit the possibility of transferring abilities and competences from one field to the other.

4) The emphasis placed on the symbolic, cognitive, planning aspects of the arts leads us to give value to the role played by problem-solving, seeing there a model in terms of which the moment-to-moment artist's behavior at work can be described. "An analysis of behavior as a sequence of problem-solving and planning activities seems to be most promising. Such an approach provides a healthy counterbalance to the stereotyped image of the artist's behavior as

immediate and unstructured" (Goodman *et al.* 1972: 49). Maintaining that producing a work of art is often a much more deliberative activity than is generally thought can have important consequences in art education. For example, a novice attempting an accurate portrayal of the human form can realize that his production is "not right" but not know what to do about it. Some ineffective efforts to touch it up with eraser and pencil will convince him that there is nothing he can do about it; the instructor can implicitly agree with him and consider this student's production as the limit of his abilities. "Thus, what should be treated as a problem, something to be solved, is treated by student and teacher as an inviolate limitation" (Goodman *et al.* 1972: 50). Therefore, albeit with all of the necessary distinctions[6], teaching problem-solving can be useful in both scientific and artistic education.

Goodman and his collaborators are convinced that these results, together with the experimental investigations cited above, can promote both arts and education in the arts. Nearly twenty years later, Goodman would remark with a certain pride: "In the early years of the Project, the very idea of the arts as cognitive and of systematic research into arts education met with widespread and virulent hostility. Nowadays the approach and the whole conception of the Project attract wide though scattered interest and respect. […] I like to think that the Project itself, by its persistent work with unwelcome ideas, may in some slight way have contributed to this change" (Goodman 1989: 2).

However, if read carefully, the Final Report reveals a lacuna: the lack of concrete didactic experiences in schools. Except for one research study of the learning of musical rhythm carried out by Jeanne Bamberger in an elementary school, all of the experiments mentioned or described in the Report were carried out with developmental psychology methods and approaches. In hindsight, however, this was by choice: the Project had eschewed "a reductive interpretation of education as 'training' or 'schooling'. No one requires an education exclusively, or even chiefly, in an instructional setting" (Goodman *et*

[6] In the Final Report, a work by Gardner (1971) is cited, in which two manners of problem-solving are described, that often, but not always, reflect differences between art and science: one type, conceptualization of relevant factor, is more prevalent in the sciences; the other, execution confirmed to a specific medium, is more prevalent in the arts.

al. 1972: 53)[7]. Furthermore, even when confronting problems of instruction in the arts, it gives equal weight to instruction and experience in a wider sense. From this point of view, it is possible to sustain – as does Gardner (1989: 161) – that "from its earliest days, Project Zero has been involved in a variety of ways in educational concerns".

In the late 1960s, members of the team visited a number of institutions with active programs in the arts, for the purpose of undertaking a rather detailed survey of ongoing effective arts-education practices. At the same time, for three years (1969-71), Project Zero organized an original educational program, whose primary audience was made up of the staff and students at the Harvard Graduate School of Education who planned to enter secondary school teaching. The program, called *Art in the making*, included a series of lecture-performances or performance-demonstrations in various artistic areas (photography, cinema, poetry, modern dance, theatrical mime, music). Professional artists prepared their presentations after consulting the researchers of Project Zero. The aim was to explain the means with which an artist creates a work of art, showing not only the finished product, but also the aspects of artistic work that are rarely visible to the public: "the exploration of alternatives, the meeting of constraints imposed by different media, the constant reworking in search of the right effect" (Goodman *et al.* 1972: 72, Goodman 1984: 160). *Art in the making* was therefore a laboratory for informal experimentation in arts education. Another very innovative initiative of the time concerned the ideation and realization, in association with the Harvard Business School, of a program of Education for Arts Management. The third of these instructional efforts was "Project Zero Course", a seminar whose objective was to introduce Harvard students to research in arts education through involving them in small research projects designed by them in cooperation with Project members.

[7] Goodman (1989: 2) would insist on the need not to lose sight of Project Zero's efforts on behalf of basic theoretical research: "Our primary function is not to select educational procedures, plan curricula, or design educational programs. […] Our task is to provide analyses and information that may help in clarifying objectives and concepts and questions […]. Much remains to be done, but when Project Zero turns to writing prescriptions and instruction books, when it becomes Project-How-To, it will have passed on to an unjust reward".

In 1972, Howard Gardner and David Perkins assumed co-directorship of Project Zero, and filled the role until 2000. Under their direction, the Project widened its area of investigation, including within it a number of other themes besides the arts: for example, children's response to television, the development of different figurative language forms, the nature of intelligence and of higher-order thinking skill, etc. In parallel, the number of educational programs, international presentations, internal researchers, and external collaborators increased[8]. Relationships with educational institutions were also reinforced: members of the staff were involved in projects and teaching experiments located in the schools, while important Project Zero initiatives such as "Spectrum" and "Arts Propel" partnered with preschools and high school, respectively[9]. When a first balance was drawn, the co-directors observed: "However, the arts and arts education have always remained prominent foci of work at Project Zero. […] We share a belief that the arts, usually celebrated as the dominion of emotions, are profoundly cognitive activities; a belief that human intelligence is symbolically mediated […]; a belief that creative and critical thinking in the arts and the sciences have far more in common than is often thought" (Perkins, Gardner 1989: VII-X)[10].

4. *Art in action, art in theory*

In 1972, Goodman left the position of director of Project Zero, but continued to cultivate the side of "art in action". He participated in the publications edited by members of the Project Zero staff, and published various articles about themes related to art education, such as *A message from Mars* and *The end of the museum?* (included

[8] Project Zero is now one of the major international centers of research into education and the promotion of learning, thinking, and creativity in the arts and other disciplines, in children and adults, at individual and institutional levels (see http://www.pz.harvard.edu).

[9] We also note the research done by Project Zero in the end of the 1990s in collaboration with the Municipal Infant-toddler Centers and Preschools of Reggio Emilia (see Giudici *et al*. 2001).

[10] On this topic, we can see the works of a psychologist, Ellen Winner, who joined Project Zero in 1973: these serve as strong examples of the importance that the question of art will continue to have in the later phases of the project.

in Goodman 1984). At Harvard, Goodman was also involved in establishing the Dance Center and the Institute for Arts Administration: he chaired the Arts Orientation Series (1969-1971) and was advisor of the Arts for Summer School (1971-1977). Most of all, Goodman actively participated as a producer in the art world, conceiving several multimedia-performance events, including *Variations. An illustrated lecture concert*, featuring twenty-one of Pablo Picasso's variations on Diego Velásquez's painting *Las meninas*. "The original painting and its variations were displayed with the help of slide projections, while a musical theme an analogous twenty-one variations composed by David Alpher were played" (Conhitz, Rossberg 2006: 9). In the same period, Goodman intensified his philosophical production, publishing numerous articles and books *Problems and projects* (1972), *Ways of worldmaking* (1978), *Of mind and other matters* (1984) and *Reconceptions in philosophy and other arts and sciences* (with Elgin, 1988). In both, the question of art returned again and again. Now, can we retrace in them influences from the research done with Project Zero? In what way does the side of "art in action" reflect on that of "art in theory"? These questions could set off many paths of inquiry about the "last" Goodman; without claiming in any way to deal with the topic in an exhaustive manner, we will limit ourselves to several essential nuclei.

A first element that seems attributable to the presuppositions and mission of Project Zero is the increased importance given to art. The chapters that make up *Ways of worldmaking* were written in the seven years prior to the publication of the book, so in the period that includes or immediately follows Goodman's participation in Project Zero, which he mentions when he thanks "my Project Zero associates Paul Kolers and Vernon Howard" (Goodman 1978: IX). The volume, which immediately generated lively discussion (see Quine 1978, for example) radicalized the constructionism of *Languages of art*, affirming that there is not one world, but rather many worlds, or rather one world for each correct version given, for each appropriate way of combining and building symbols. There is not one absolute reality; rather, a world is real for the version of which it is composed, just as a version is correct for the world it constitutes. In this new perspective, which "eventuates in something akin to irrealism" (Goodman 1978: X), it does not only admit that "the arts must be taken no less seriously than science as modes of discovery, creation, and enlargement of knowledge" and that therefore "the philosophy of art should be con-

ceived as an integral part of metaphysics and epistemology" (Goodman 1978: 102). The arts assume an even more crucial role, not so much in and of themselves as in relation to a gnoseological strategy that, giving up the exercise of a foundational mechanism (see Chiodo 2006: 13-36), speaks of "ways of worldmaking", "fabrication of facts", "worlds in conflict" and substantial continuity between reality and fiction.

The arts make world-versions using various means of reference: statement, description, representation, exemplification, and expression. In certain cases, such as that of abstract painting, we might think that the ability to represent any world, real or fiction, is lost. But this is not true, because it is precisely in these cases that it becomes clear how a generally neglected way of reference works, and that is it so typical of works of arts as to be an aesthetic symptom: exemplification. Works of abstract painting exemplify certain properties that can literally or metaphorically serve as samples of shared or shareable forms, colors, feelings, such works "induce reorganization of our accustomed world in accordance with these features, thus dividing and combining erstwhile relevant kinds, adding and subtracting, effecting new discriminations and integrations, reordering priorities" (Goodman 1978: 105). In other words, such works operate as symbols, and therefore may activate all of the process that Goodman places at the foundation of worldmaking both in art and in science or in the perception of daily life. As a result, it is necessary to revise the conviction according to which knowing would be exclusively or mainly related to the determination of what is true. In fact, while the truth pertains solely to what is said, worlds are made also by what is exemplified and expressed – by what is shown as well as by what is said: "A nonrepresentational picture such as a Mondrian says nothing, denotes nothing, pictures nothing, and is neither true or false, but shows much" (Goodman 1978: 19). Rather than speak of pictures as true or false we might better speak of theories as right or wrong. Truth itself cannot be conceived as corresponding with a ready-made world: "Rather than attempting to subsume descriptive and representational rightness under truth, we shall do better, I think, to subsume truth along with these under the general notion of rightness of fit" (Goodman 1978: 132).

The procedures and criteria adopted in the search for correct world-versions go from deductive and inductive inferences to faithful exemplification and agreement among samples. Goodman reveals

that the correctness of an inductive inference does not depend only on the truth of the premise and the validity of the argument, as in deduction. In the case of induction, the completeness of the examples confirming the premise also count. Such completeness depends, in its turn, on effective categorization, understood to mean selection and application of relevant kinds or projectible predicates that are valid for generalization-prediction. What about correctness as related to non-verbal world-versions? When is the exemplification provided by an abstract painting correct? These questions imply a wider question: which are the criteria of fairness of a sample? Goodman examines various types of samples: samples of fabric, samples of grass seeds mixed in a container, samples of drinking water. In all of these cases, a sample can be considered fair if it can correctly be projected on the features which it exemplifies, that is, if it is obtained and interpreted according to good practices of categorization. Control procedures then become relevant, such as consistency among samples and between different applications-projects of the examples-samples, which, in their turn, depend on which labels or kinds are relevant and right. As in ordinary induction, entranchement (or, the record of past projects) of a good practice, the story of habits and variations in its style of use, is a preeminent factor. On the other hand, what makes a work of art a fair sample? Works of art are not examples that come from some roll or container, but samples of an ocean: the features of the whole are indeterminate, so the correctness of the drawing, the color, the harmony – the fairness of a work as a sample of these features – is confirmed by the good result that we obtain in discovering and applying that which is being exemplified. In art, the correctness of exemplification coincides with creative ability: the fairness of the work is in fact tested on its efficacy in building a sort of "entranchement-novelty", discovering new categories or a different application of them: "A Mondrian design is right if projectible to a pattern effective in seeing a world. When Degas painted a woman seated near the edge of the picture and looking out of it, he defied traditional standards of composition but offered by example a new way of seeing, of organizing experience" (Goodman 1978: 137). Art, by virtue of its own *work*, its own ability to demonstrate to the maximum extent, the link between comprehension and creation, plays an exemplary role for the same philosophical investigation: art shows that the knowing – even that of science – is, most of all, an "advancement of understanding" (Goodman 1978: 22, but see also

Goodman 1988: 161-4), a work of adaptation that stretches the field of the aspects that we can discern and identify as such.

Another element that seems attributable to the ultimate purpose of Project Zero – the development of art through improvement in the education of artists and the public – is the notion of "implementation" of the arts, through which Goodman highlights the relational aspect of the aesthetic experience, the connection between the aesthetic function of a work and the response from an audience. Execution "consists of making a work, implementation of making it work" (Goodman 1984: 143, see also Goodman 1998). The channels through which the arts enter into culture – publication, exhibits, and performance for an audience – are also means of implementing a work. While Goodman also includes the entire process of creating a work in "execution" (from its initial concept to the final touch), within "implementation", he includes "all that goes into making a work work; and a work works, in my view, to the extent that it is understood, to the extent that what and how it symbolizes […] is discerned and affects the way we organize and perceive a world" (Goodman 1984: 143). Execution and implementation can be distinguished from one another even when – as in the performative arts – they occur together: a work must be executed prior to being implemented, in that a work is something made. However, since implementation can make something that is not art function as such (for example, a stone collected from the beach and then exposed in a museum), execution and implementation make up a continuous process: "On the one hand, execution of a work is required for its implementation; on the other hand, implementation is the process of bringing about the aesthetic functioning that provides the basis for the notion of a work art" (Goodman 1984: 145).

Let us return for a moment to a passage from the quote cited above: "a work works […] to the extent that it is understood". Since making a work work means above all improving its comprehension, implementation must have not only a communicative valence, but also an educational one. Not by chance, the questioning of the work of works reemerges in the reflections that Goodman dedicates to the educational mission of museum institutes. The task of museums is to make the works that it holds work, inculcating within the visitors the ability to see them. In fact, what we see in a museum can influence what we see when we leave it. Works work "when by stimulating inquisitive looking, sharpening perception […] they participate in the

organization and reorganization of experience, and thus in the making and remaking of our worlds" (Goodman 1984: 179-80). On the other hand, to appreciate the educational mission of museums, we must admit that education cannot be reduced to only a verbal process; it is not made up only of knowledge, that is of true beliefs, but of a wider "advancement of understanding". Thus, understanding a painting "involves discerning its special stylistic and other visual properties – learning how to see it and see in terms of it" (Goodman 1984: 173). Its educational value beyond knowledge of the artistic symbols depends also on the manner in which it makes our sight more acute. Among the symptoms of the aesthetic is the relative repleteness, for which many aspects of a symbol are significant: for example, if we compare the profile of a mountain in a drawing by Hokusai with the profile of a stock market graph, we can realize that in the first, each form, line, thickness, etc. has an importance, while in the second one, the only thing that counts is the distance of the line from the base. This characteristic, along with the other symptoms of the aesthetic, tends to draw the attention to the symbol instead of making it only the means through which we can reach what we are referring to. The nontransparency of a work of art trains us to rest on what we observe, to widen our vision without neglecting a single detail, in order to see aspects and structures that we would not have been able to otherwise. Education for the arts does not only allow us to produce, understand, and make works work, but also to improve the understanding and creation of the worlds we live in.

Bibliography

Bollino, F. (ed.), *Estetica analitica/1*, "Studi di estetica", n. 31/27 (2007), Bologna, Clueb.

Carnap, R., *Der logische Aufbau der Welt: Scheinprobleme in der Philosophie* (1928), Hamburg, Meiner Verlag, 1961.

Carter, C.L., *A tribute to Nelson Goodman*, "The Journal of Aesthetics and Art Criticism", n. 58/3 (2000), *Symposium. The legacy of Nelson Goodman*, pp. 251-3.

Chiodo, S., *Visione o costruzione. Nelson Goodman e la filosofia analitica contemporanea*, Milano, LED, 2006.

Cohnitz, D., Rossberg, M., *Nelson Goodman*, Chesham, Acumen Publishing, 2006.

Cometti, J.-P., *Activating art. A view from France*, "The Journal of Aesthetics and Art Criticism", n. 58/3 (2000), pp. 237-43.

Ernst, G., Steinbrenner, J., Scholz, O.R. (eds.), *From logic to art. Themes from Nelson Goodman*, Frankfurt-Paris-Lancaster, Ontos Verlag, 2009.

Hetland, L., Winner, E., Veenema, S., Sheridan, K., *Studio thinking. The real benefits of visual arts education*, New York, Teachers College, 2007.

Franzini, E., La Matina, M. (eds.), *Nelson Goodman, la filosofia e i linguaggi*, Macerata, Quodlibet, 2007.

Gardner, H., *Problem-solving in the arts and sciences*, "The Journal of Aesthetic Education", n. 5 (1971), pp. 93-114.

Gardner, H., *The arts and human development*, New York, Wiley, 1973.

Gardner, H., *Frames of mind. The theory of multiple intelligences*, New York, Basic Books, 1983.

Gardner, H., *Towards more effective arts education*, in H. Gardner, D.N. Perkins (eds.), *Art, Mind and education. Research from Project Zero*, Urbana-Chicago, University of Illinois Press, 1989, pp. 157-67.

Gardner, H., *Project Zero. Nelson Goodman's legacy in arts education*, "The Journal of Aesthetics and Art Criticism", n. 58/3 (2000), pp. 245-9.

Gardner, H., Perkins, D.N. (eds.), *Art, mind and education. Research from Project Zero*, Urbana-Chicago, University of Illinois Press, 1989, originally appeared in "The Journal of Aesthetic Education", n. 22/1 (1988).

Gardner, H., Winner, E., *Artistry and afasia*, in M.T. Sarno (ed.), *Acquired afasia*, New York, Academic Press, 1981.

Gardner, H., Winner, E., *The arts have much more to teach us*, "Education Week", n. 37/7 (2017), p. 24.

Goodman, N., *A study of quality*, PhD thesis, Harvard University, first published New York, Garland, 1990.

Goodman, N., *The structure of appearance*, Cambridge, Harvard University Press, 1951.

Goodman, N., *Languages of arts. An approach to a theory of symbols*, Indianapolis-New York, The Bobbs-Merrill Company, 1968.

Goodman, N., *Problems and projects*, Indianapolis-New York, The Bobbs-Merrill Company, 1972.

Goodman, N., *Ways of worldmaking*, Indianapolis, Hackett Publishing Company, 1978.

Goodman, N., *Of mind and other matters*, Cambridge, Harvard University Press, 1984.

Goodman, N., *Aims and claims*, in H. Gardner, D.N. Perkins (eds.), *Art, Mind and education. Research from Project Zero*, Urbana-Chicago, University of Illinois Press, 1989, pp. 1-2.

Goodman, N., *Art in action*, in M. Kelly (ed.), *Encyclopedia of aesthetics*, New York, Oxford University Press, 1998, vol. II, pp. 322-6.

Goodman, N., Elgin, C.Z., *Reconceptions in philosophy and other arts and sciences*, London, Routledge, 1988.

Goodman, N., Perkins, D.N., Gardner, H., *Basic abilities required for understanding and creation in the arts*, Final Report Project n. 9-0283, Washington D.C., U.S. Department of Health, Education, and Welfare, Office of Education, 1972 (https://eric.ed.gov/?id=ED071989).

Giudici, C., Krechevsky, M., Rinaldi, C. (eds.), *Making learning visible. Children as individual and group learners*, Reggio Emilia, Project Zero and Reggio Children, 2001.

Hacking, I., *The social construction of what?*, Cambridge, Harvard University Press, 1999.

Handjaras, L., *Problemi e progetti del costruzionismo. Saggio sulla filosofia di Nelson Goodman*, Milano, Franco Angeli, 1991.

Iacono, E., *Educare con l'arte. Nelson Goodman e l'Harvard Project Zero Development Group*, in E. Franzini, M. La Matina (eds.), *Nelson Goodman, la filosofia e i linguaggi*, Macerata, Quodlibet, 2007, pp. 201-15.

Marchetti, L., *Arte ed estetica in Nelson Goodman*, Palermo, Aesthetica Preprint Supplementa, 2006.

Matteucci, G. (ed.), *Elementi di estetica analitica*, "Discipline Filosofiche", n. 15/2 (2005), Macerata, Quodlibet.

Perkins, D.N., *Knowledge as design*, Hillsdale, Lawrence Erlbaum Associates, 1986.

Perkins, D.N., Gardner, H., *Why "Zero"? A brief introduction to Project Zero*, in H. Gardner, D.N. Perkins (eds.), *Art, mind and education. Research from Project Zero*, Urbana-Chicago, University of Illinois Press, 1989, pp. VII-X.

Perkins, D.N., Leondar, B. (eds.), *The arts and cognition*, Baltimore, Johns Hopkins University Press, 1977.

Quine, W.V., *Otherworldy*, "New York Review of Books", n. 25/18 (1978), p. 25 (reprinted as *Goodman's* Ways worldmaking, in *Theories and things*, Cambridge, Harvard University Press, 1981).

Rudner, R., Scheffler, I. (eds.), *Logic and art. Essays in honor of Nelson Goodman*, Indianapolis-New York, The Bobbs-Merrill Company, 1972.

Winner, E., *Invented worlds. The psychology of the arts*, Cambridge, Harvard University Press, 1982.

Winner, E., *The point of words. Children's understanding of metaphor and irony*, Cambridge, Harvard University Press, 1988.

Winner, E., *How art works. A psychological exploration*, New York, Oxford University Press, 2019.