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# Constitutive and regulating modes of learning in creative design education

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***Abstract:*** *The main aim of this research to analyse the learning process in order to recognize the characteristics currently associated with creating and/or creative students profiles. This paper focuses not much on the psychology of individuals as on the learning process as an intersubjective network of social relations. The theoretical framework considers holistic judgement and arithmetic assessment as evaluation modes and the relevance of fiction within the learning process. With these referents we have developed a polarized parametric system as a framework for mapping learning practices and teaching strategies. On one side we consider the actions related to the constitution of new spheres of creativity. On the other, we discuss regulation sets that allow the creation of design projects. This analytical tool is a guide for actively involved observation, we have tested the theoretical model and the parametric system within a series of project oriented courses in the Design Degree. As a result, the learning process in design happens to be a mode of learning rather than a learning style. We developed a communicating vessels model explaining unfeasible contradictions in the assignment of marks as the result of an experience based device to adapt assessment to both learners and design diversity.*

*Keywords: assessment, modes of learning, design creativity.*

## Introduction

Over the last few years, the aim of a clearer, criterion-based judgement has turned the assessment of design projects into a summative process. A set of requirements for the final result are collected and submitted previously to the students. One by one, these requirements are used to scrutinize the student's portfolio in order to identify the relevant qualities of the work, to reference these qualities in a marking scheme, and, finally, to count the marks to obtain the awarded grade. Richard Kimbell has raised

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a central question about this process questioning whether: " this added-up collection of parts is the same thing as 'capability'" (Kimbell 2009, p. 5)

It often happens that the arithmetic assessment doesn't match a teacher's judgement despite the accepted accuracy of the listed criteria. Usually, when this occurs, we are more likely to adjust the numbers than to doubt our holistic approach to the student's project. Rightly so, we are not just ticking small boxes in order to avoid the big black box of the holistic assessment process. But to doubt this form of atomised assessment does not mean that we have to trust blindly our intuition and make direct comparisons without general criteria. Rather than avoiding the black box of holistic judgements, or relying confidently on it, perhaps we ought try and open it up to understand and to describe how it works. This is a necessary condition not only in order to identify the strengths and weaknesses of the different procedures used in assessing students' capabilities, but also to explain why holistic judgement and arithmetic assessment are complementary.

Considered as a meta-device, the process of assessing design projects conforms the measurability of the different devices that constitute the design project –scenario scripts and requirements documentation, sets of formal solutions, usability tests, viability accounts, etc–. As a meta-device, the evaluative action builds models based on design theories. Design theories are prescriptive in character rather than a descriptive, when assembled into evaluative models. But usually design theories are not much explicit, so teachers and designers are not always aware of the tacit theories that are at the core of the assessment devices. Holistic judgements are based directly on design folk theories, as general ideas about what we mean when we talk of design, knowledge based on experience and routines, acquired habits without a theoretical formulation but with deep professional roots. The arithmetic assessment is based only on partial and circumstantial instantiations of design folk theories. This is what we mean when we propose to open up the black box of evaluation.

The fundamental values of the assessment cannot only be derived from the features and mechanisms within learning theories. They have to be sough within the wider framework of creative design. In this sense, this paper considers the difficulties observed when assessing design projects as a point of departure to explore the relationship between ideas and practices of creativity in design, as well as between the design project and the learning process. To put in another way, this paper could be seen as an essay about reverse assessing, opening the black box of holistic judgements, identifying strengths and weaknesses of different procedures in assessing, explaining the complementarity of judgement and assessment, identifying tacit theories at the core of assessment devices and exploring the relation between ideas and practices of creativity.

Initially our essay on reverse assessing starts with a detailed description about how the procedure of evaluation works. We identify the problems of evaluating a design project, as we learn about how students and instructors think, behave and produce meaning, through mutual interaction. In a second level of analysis we have considered points of controversial assessment, three of which are discussed in this paper. The identification of malfunctions and/or contradictions during assessment helps to deploy features that are usually hidden and silent in the evaluation process, as matters of concern (Latour 2005, p. 115). Mapping such matters of concern has been our way of opening up the black box not only of design project evaluation but also of the narrative images about design authorship and project driven creativity. In words of Hyden White, narrative and narration might well be considered a solution to a problem of general

human concern, of how to translate knowing into telling. Rightly so, in our research we use narrative images as a solution to fashioning human experience into a form assimilable to structures of meaning, as we do so in design teaching (White 2003, p.117).

This paper is built around a dialogue between two different experiences, on the one hand, quantitative research into cultural transmission trough multimodal media, and on the other, the ethnographic description of creative processes in post-studio art and design. The result is a multifaceted research project conducted over 7 months, from March to September 2012, at Eina (Barcelona) where we both teach. Seeking an in depth analysis rather than a broad overview, our main focus was on a limited number of student graphic design projects. We followed 28 projects and were directly involved in the development and evaluation of students' work, and. The research compare students' presentations with the verbal evaluations of the jury and the grades assigned later. Finally we also conducted some interviews with teachers and students from other graphic design project oriented courses, in which we were not directly engaged. The interviews made it possible to obtain personal points of view to contrast our direct experience with other educational and learning practices.

Carrying out participant observation within our own teaching has supposed a systematic self-reflection about our role as academic instructors as well as restructuring of previous ideas regarding design learning and design processes. This has involved a reflection about the kind of research envisaged and the conceptual challenges it implied. It also triggered questions about the way current results are presented. In our research we used narrative images as analogies in order to facilitate new ways of thinking or interpreting design learning and projecting. Narrative images empower conceptual systems to perform explanations in different contexts. With these images we sought to try out ways of combining creativity and authorship in a framework that incorporated psychological and individual based notions of learning styles and creativity. Notions of learning style, that were considered, and partially transcended, to be reconsidered as a network of social relations. Thus, design learning and design process will be redefined as a set of integrative modes.

## Learning styles and creativity

There are many characteristics currently associated with creating and/or creative persons in different artistic fields. In this report we take into account both the manifestation of a person's potential and its social recognition, in order to identify the differences between creating and creative persons, as De la Torre (2000) does:

- The creating person: shows creativity in valuable achievements
- The creative person: creative potential not fully exploited

The differences in personality traits among learners are typically associated with different learning profiles or learning styles (Leahy et al. 2009) in the design learning process. The problem is whilst there is a lot of literature concerning the psychology of individuals during the learning process, there's not much research about the learning process as an intersubjective network of social relations.

We consider the learning process as an intersubjective network of design, particularly within project oriented courses, which is the focus our research. Learning strategies, in project-oriented courses, commonly involve different activities with the aim of introducing tensions between theoretical knowledge and the common world of

experience. Susana Barco de Surghi (1988) identifies these tensions as an opportunity for generating an open attitude to creation within the learning state of affairs.

Design teachers stage the tensions between real world scenarios reproduced in projects, using methods such as viability, analysis of previous examples, case comparison, etc. The learning context always implies multivariable agents, subjects and different levels of reality –and fiction– as learning is no longer reliant solely on individuals, so much as on an intersubjective network of multiple nodes and relations.

On one hand we consider the actions related to the constitution of new spheres of creativity. On the other, we discuss regulation sets that propitiate the creation of design projects.

## Talking about ugliness or dealing with it: form and content in design judgements

Different sorts and degrees of discordance between atomised and holistic approaches to assessment have been observed during our research. The first situation that we are going to consider is a clear example of dissension between the arithmetical results of the criteria based assessment on the one hand, and the judgment of a teacher –and experienced professional designer– on the other, when directly comparing the results without employing sets of abstract criteria. After the midterm evaluation of the Editorial Design course, the students, then in their 3rd year of a 4 year degree course, were asked to design the layout and pilot issue of a magazine on a subject of their choice. The magazine project was conceived as the final project to evaluate the key and transferable skills. Two different ways of being good or poor were at play when comparing the grades resulting from the use of an assessment chart –with a closed list of criteria– when ranking the learners in relation to each other.

The most blatant divergence appeared when the arithmetical assessment assigned a poor 45/100 to one of the projects that was rated most highly –by C.A.– according to the holistic judgement. The divergence was explained as being due to “technical faults”; the misalignment of the text boxes to the main grid, or the misuse of the Adobe Indesign tools to define layout styles. Despite the relevance of the acquisition of these skills as being principal objectives within the course, the capability of the learner was not question and the faults were considered to be part of her learning profile, after some doubts the grade was revised upwards. Talking afterwards separately to both the teacher and the student, the traits of this profile were clearly defined and coincided. During the informal interviews, the perception of the magazine shifted from being solely test evidence, flagging up the results of the course programme, to become a sort of vivid self-portrait of its author, able to encapsulate personal attitudes, interests and, even, hopes and fears.

Although we didn’t use any kind of indicator tool during the interview, the way the teacher expressed her opinions about the learner, and the way learner described herself, were a clear example of an heuristic approach to non-systematic but normative exposition of the facets of student diversity. Afterwards, reviewing the notes taken during the two interviews and confronting them with an outline, such as the one offered by Richard M. Felder and Rebecca Brent (2005), regarding learning style preferences, orientations to studying, and levels of intellectual development, we obtained a definite characterization of the coincidence between the instructor’s intuitions about the learner and the learner’s self-opinion. An accurate learner profile is defined –extravert rather than introvert, intuitor rather than sensor, feeler rather than

thinker, sequential, active, visual– even though the analysis is based not on the actual person but on her virtual projection in the work. What we were in reality talking about was about a mode of learning rather than a learning style.

But the correction of the arithmetical grade is not easy to explain as merely an accommodation of the assessment system in recognition of the different learner profiles. But is an acceptance of idiosyncrasy sufficient to relativize the evaluation system? When asked directly, the teacher invoked the comparison between projects as of way defending her decision to upgrade the student. She showed C.A.'s project alongside a project authored by G.P., a fellow student on the same course who had achieved a grade of 85/100. Both students had chosen ugliness as the subject of their magazine. Despite the excellent realization, the appropriate use of typography and the rigorously composed layout, G.P.'s final result was clearly "a lot duller" than C.A.'s project. While turning quickly the pages of C.A.'s pilot magazine, the teacher was reassured in her decision:"It's a good piece of art direction, full of mistakes, but she has done a good job!"

Looking back on the opinions of the students about their respective projects. C.A. expressed her admiration for G.P.'s focus on details and admitted that her own work would be better with a similar attention to detail, but she concluded that this was quite beyond her, that she would never achieve this. In turn, G.P. observed that in his magazine ugliness was a circumstantial subject: 'In fact, my layout would suit anything, beauty too, but C.A.'s magazine has absorbed ugliness not as an external factor but as intrinsic to the design."

## The collective author: sources of agency in the design project

The detailed analysis of this micro-situation is useful as a way of framing both the learning process and design creativity as the results of the relationship between the author, the project and the state of affairs.

1. Student / designer profile. Skills, attitudes, orientations, intellectual interests, etc. The differentiating factors between C.A. and G.P. If we consider the design process in light of a hunting analogy, some designers will have the profile of patient, methodical trappers of small preys, and others that of adventurous and imaginative hunter in search of a white whale.

2. Project qualities. Just like the experienced animal that knows the habits of the hunter, the project triggers a certain metamorphosis in the author, causing the author to assume each individual disguise. In this sense what we consider to be *project immersion* is the process of transformation that makes it possible to transcend acquired habits and personal limitations. The sense of anticipation, inherent in all design projects is the engine that moves this dynamic mimesis.

3. State of affairs. The professional or educational conditions are the scenario where learning-creative activity takes place. This scenario is also dynamic, as its shapes and changes producing a second kind of immersion, an adaptive one. Adaptation to the state of affairs results from the author dealing with technological constraints, brief conditions, instructors and fellow students comments, assessment charts, syllabus, course programmes, etc. The contextual vortex assures the confrontation of design with reality. To continue with the hunter analogy, here, the personal profile of the author camouflages itself in order to blur into the backdrop of the forest.

Both the project and contextual vertices can be considered as fictional devices involved in reshaping the author's profile, combining different mimetic unities (Schaeffer 2010) generated at either the project-anticipation vortex or at the vortex of context-adaptation. Applied to our case, G.P. has overplayed an adaptive role and attained a high grade but with an average outcome. C.A., on the other side, has adopted a creative role and failed to adapt to the constraints of the learning context but vibrates beautifully with ugliness.

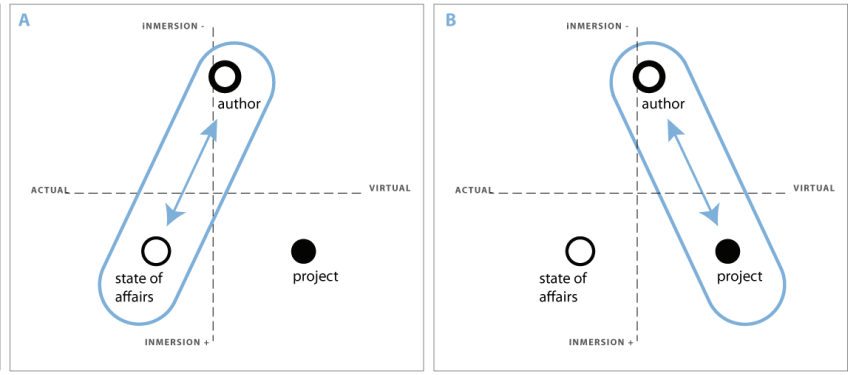


*Figure 1. Two forms of author immersion: adaptative (A) and anticipative (B).*

We use "mode" to define the different positions that the author's profile assumes as a result of the immersions: the balance between the project-anticipative vortex and the contextual-adaptative one. So, with "mode" we indicate a particular way to think about design as an anticipative, world-making activity while, at the same time, confronting a particular design state of affairs –either a professional or a learning one–. If the contextual immersion is dominant, the author's profile will turn on a regulative mode. On the opposite pole, if the main immersion is on the project vortex, the mode will become constitutive. Any system of evaluation creates a contextual constraint but, at the same time, needs to accommodate the different modes at play. This is coherent with the remark made by Shana Agid that "design practice methods include tools and aptitudes for working with unstable problems and imagined futures in which the object of study and inquiry is, nevertheless, real" (Agid 2012, p. 1).

Looking for a way to measure the incidence of the three sources of agency in the construction of the author's voice, we found that the front page of the degree project are all identical in contents –name, title and object– but differed in their hierarchy of their typographical display. Some students graphically highlighted their name, others the title of the project, and a third group the object –degree project and name of the institution–. We used these hierarchies to group the projects with the grades attained.

***Table 1. Results of agency distribution on the state of affairs-project-author interaction. Curs de retitulació. Eina, july 2012.***

| | **Students** | **Average mark attained** | **Highest grade** |
|---|---|---|---|
| **Author's name** | 12 % | 83/100 | 85/100 |
| **Project title** | 60 % | 73,6 /100 | 100/100 |
| **Object** | 28 % | 82 /100 | 100/100 |

As shown in Table 1, the 60% of the students highlighted the title of the project, so the project was the most common agent in the construction of the author's voice.

Despite the tool was able to measure the relevance of each agency, we observed the average marks attained in the project agented cases weren't obtaining the highest grades. There wasn't any cause-effect relation between sources of agency, highest relative and highest absolute grades. To have a project agency in the construction of the learner's voice doesn't grant a high grade, as C.A. case suggested. Then, what reasons makes a project-author-context get the highest grade in an assessment?

## Getting the same grade for different reasons: constitutive and regulating elements in assessment

As the preceding research revealed, some projects got the highest grades despite being in different categories. The reasons for why these cases got the maximum grades differ, even though the criteria employed in the assessment were the same. Given this situation we decided to explore the differences between two agents of the triadic mode as a dynamic variable –projects and students– with the third one as an static variable –the state of affairs–.

We considered two cases of final degree projects, designed during the 4th year, where both projects –by I.C. and B.M.– came from the same context achieved the highest grades. However, if the jury had maintained the same criteria when assessing I.C.'s project and B.M.'s project, the latter wouldn't have received an A. It would have undoubtedly been treated as a poor project. Equally if B.M.'s project had been assessed using a different set of criteria I.C. would not have received the deserved grade.

I.C.'s project was a constitutive project. The learner developed it from an established index, but it soon evolved into a piece of fictionalized history, while remaining the basis for a new family rum label. I.C.'s project started with a free interpretation of the last point on the initial established index: creating the conversations he thought people would have around a rum cocktail, mixed with his rum label. The learner developed a constitutive project by way of a free interpretation of the index constituting a new sphere of action, far from the fictions of the rest of the group. At the end IC established a new and detailed index for his project. He adapted the criteria from the initial index to fit it partially in the arithmetic schemes of assessment. Even though the project was a real model of the creativity learning, the jury commented that some parts of the project viability lacked credibility.

The second is a regulating project where the learner –B.M.– redesigned the idea of newspaper adapting the reading experience to a digital device. Initially she followed

the given index to the letter. When she had explored all the graphic aspects of the project; typography, rhythm, composition and infography she started to work on new tasks in order to fulfil the index. At the end B.M. obtained a lot of data about the usability and semantic viability and ended up having to create and regulate new sub-sections of the initial index. B.M. developed the perfect project for a summative assessment. The jury explained that even though the project was perfect it was "lacking in soul".

As a final consideration we identify the project of B.M. as an agent that allows her learner profile to adapt to the specific constraints of the index. In the second case we identify I.C.'s project as an agent that allows the learner to anticipate a new sphere of summary development.

Taking all this into consideration the main arguments are:

- 1. The project has an agency on the design learning process.
- 2. Getting an A doesn't mean getting the highest value according to constitutive and regulating modes.
- 3. It's feasible that projects with a "little lack in soul" obtain the highest grade.
- 4. Points 2 and 3 can't be done or explained solely with an arithmetic assessment.

## Communicating vessels

Let's say an evaluating system –judgement or assessment– is ultimately a communicating vessels model. Let's say the homogeneous fluid it contains is the maximum amount of points a project can get –e.g. 10 l.–. During the evaluation process, the liquid settles and it balances out a grade.

In design project evaluation we've considered two main containers for this evaluative substance, the constitutive and the regulating. Each teacher establishes the shape and volume of the containers according to the course objectives, so the liquid grade will be distributed according to the program requirements. Looking through the mirror of this analogy we could incorporate an arithmetic explanation of how the teacher uses the vessels as an accumulative collection of shots when applying criteria-based assessment. When adding-up the liquids a new level will be established within the two connecting vessels. When adding-up 10 ml of liquids, the project gets an A grade –see figure 2–.

But as we observed previously, sometimes the fluid doesn't seem to achieve the same level in all parts of the system. Getting an A doesn't mean reaching the highest value with constitutive and regulating containers. Getting an A means the fluid is balanced out and it reaches the maximum in one or both containers. And there's a way to do it even it's not possible to increase the liquid amount in only one container, even though the total amount of liquid added may not be the maximum amount.

A holistic judgement could gently overturn the system, inclining ever so slightly the vessels in order to allow the project to achieve the maximum level in a regulating or constitutive way. This is known as "The Mean Lean" –see figure 2–.

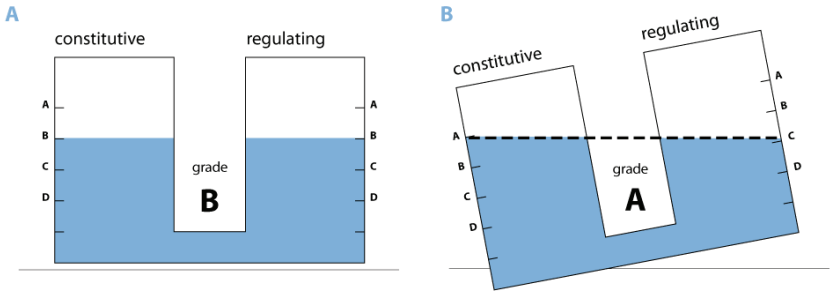


*Figure 2. Communicating vessels. The project gets a B grade (A). After "The Mean Lean" the project gets an A grade (B).*

How do teachers mean The Mean Lean? The communicating vessels theory is useful to escape a scenario of arbitrary uses of evaluative criteria, or a relativist one, in which each learner has to be assessed depending on their singularity. The way to attain a grade might seem different but they are the result of the application of the same logic: the search for an equilibrium between the opposing poles within a parametric system. But if the charted criteria of the arithmetic assessment is not enough to explain the logic of the communicating vessels, what are the hidden criteria at work? The presentation of a third case will help to explain this.

## Plots and outcomes: design project on stage

The project authored by C.V. was intellectually ambitious. Based on connectionist theories it proposed redesigning the infography of the metropolitan public transportation of Barcelona. The redesign started with a broad research into cognitive sciences. The aim of C.V. was to redefine radically the representation of the metro map as a system of transfer lines, instead of a system of metro lines. The main goal was not to increase the usability but to redefine the basis of infographic conventions with a more accurate understanding of mind procedures, as a new point of departure. The development of this idea led the project to a system of graphic representations devoid of metro lines, with serious applicability problems. On the one hand it rejected the graphic resources traditionally used in mapping public transportation. On the other, the project wasn't tested and the results were questionable as they lacked state of affairs immersion. The C.V. case was a typical project on a constitutive mode of learning. During the assessment, one of the jury' members criticized a collection of final communication pieces –designed for smartphones and the metro guide– that seemed to hark back to a more conventional tune. She asked for general conclusions and a reflection on the sense of the project.

In this case we have an assessment situation where the arithmetical grade remained unmodified. The C.V. degree project was clearly a constitutive one and immersion on anticipation was dominant over contextual adaptation. But something happened at the end of the presentation, the interest remained undiminished during the first part, and no objections were made about the lack of viability of the result. The student was playing out her role, a strange mixture between designer and neuroscientist, and the audience was trapped by her fiction. But with the realist final

applications, the illusion abruptly vanished. Perhaps this vanishing moment is the key to explain what drives the overturning mechanism of communicating vessels.

Kirsten Hastrup in a series of challenging papers on the role played by imagination in social action, has discussed illusion as the key "to understanding how society is realised in the actions of people engaged in a gradual fulfillment of what they see as the current and relevant drama" (Hastrup 2007, p. 27 and 2004, p. 223). Hastrup identifies illusion with the theatrical notion of the ˝suspense of form˝ that means not so much the uncertainty about outcome as the process of getting there. When confronted with a project in the constitutive mode, we are under the enchantment of this suspense of form. The illusion of wholeness moves us to complete the story –in drama–, or to imagine a new context where the project might have viability or even sense –in design–, or to tick the small boxes that remained empty in the evaluation chart –in holistic judgement–. The fault of C.V. was to break the engagement of her audience when she returned to the prescriptive nowadays state of affairs, without realizing that, actually, she was designing outwith the state of affairs. So, in holistic judgment the "holism" is not simply about the complete understanding of the actual project, but also includes imagining the world made thinkable by it.

If illusion of wholeness explains the reception of constitutive projects, and, particularly, how the anticipative character of design is assumed, what happens on the opposite side of the parametric model, when creative action is on a regulating mode? As the result of an adaptive immersion, what makes a regulative project gripping is the organization of the events in a suspense of plot, our illusion now is not about the outcome –because we know that it will be close to our actual world– but the representation of action. This reminds Aristotle's notion of plot as the inner soul of the play: "(...) plot, like an animal's soul provides a play with its essential identity, function and purpose" (Rorty 1992). Let us not forget, "lacking in soul" was how a member of the jury defined the regulating project authored by B.M. The emplotment of regulating projects, as in theatre, achieves "its realistic effect not by *copying*, but by making the audience vicariously experience real actions as intelligible" (Hastrup 2007, p. 27) . The adaptation to the context is not an imitation but an emplotment of design experience that serves to condense, to display, and to make noticeable and manageable the sets of conventions that are replicated and interpreted in the project. In this case, the overturning mechanism of holistic evaluation acts in response, not to the imagination of new worlds, but the recognition of new layers deep inside the present world.

# Conclusions

The aim of this research was to clarify the effects of different educational settings on design practices. At the end of this research, we are able to explain two educational modes of learning in project oriented courses in design, the constitutive and the regulating mode.

We also can explain the differences between a holistic judgement and arithmetic assessment as a complementary evaluation processes, using the communication vessels model. The influence of summative assessment leads the students to a misuse of constitutive and regulating modes because assessment criteria introduces frames for each device, so the learners conceive the project as a mere addition of parts lacking the sense of wholeness. The influence of holistic assessment should lead the learning processes to a conscience/self-reflectivity about the appropriate mode of projecting in any given situation or imagined scenario.

To identify the tacit theories of design that are at the core of the assessment devices has been proved plausible. It should use the study of controversies in evaluation as a way to reveal subjacent criteria based on professional folk theories. Once upon this point, the research should focus on cognitive sciences as a way to explain why the use of ranking methods seems a natural process to assess, and if there's any relationship between the use of comparison methods and the natural process used to "evaluate the world", comparing what we perceive with what we know.

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