

# A THEORETICAL FOUNDATION FOR INTERLACING ARTISTIC AND ACADEMIC METHODOLOGIES

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## ABSTRACT

The paper reflects upon the integration of academic-scientific methods and artistic strategies for art and technology projects that address user participation in socially defined domains. It addresses the historic and formal difficulties in combining classroom teaching and experimental artistic project work in that each belongs to a different set of epistemology and pedagogical discourse.

The paper describes its field of inquiry, namely art and technology student projects as being part of an extended art field. These projects deploy, firstly, artistic strategies and forms of expression that are the result of the cultural autonomy of art and, secondly, scientific knowledge and methods drawn from engineering, social science and the humanities alike. Consequently, these projects' trajectories can neither respect the purposeless autonomy of art or the academic discourse of finding solutions to well-defined problems. What kind of methodology can accommodate this seemingly paradoxical situation?

The paper proposes Luhmann's relative difference between medium (loosely coupled elements) and form (tightly coupled constituents) as a theoretical and heuristic tool for productive interferences between artistic and scientific methods. Art and technology projects operate within a field of existing forms (e.g., social patterns, urban and interior spaces, etc.), which must be de-coupled prior to decisions related to novel forms. Art as novel re-couplings is often considered as the artistic impetus *per se*, where form yields its own medium. But re-coupling and new-coupling is intrinsically bound to the decoupling process. Due to the complexity and objectives of art and technology (or art and science) projects, the de-coupling/re-coupling/new-coupling process necessitates a variable combination of a selection of different scientific and artistic methods depending on the type and nature of each particular project. The paper elaborates upon and exemplifies the proposed heuristic through various art and technology projects as part of university teaching.

## INTRODUCTION

Since 2008, Aalborg University has been offering the study program Art & Technology (henceforth ArT). ArT is a cross-faculty educational program and research collaboration between the Department of Architecture, Design and Media Technology (part of the engineering and science faculty) and the Department of Communication and Psychology (part of the Faculty of Arts). ArT positions itself in the wake of a long history of art-technology projects conducted by individual artists, universities and art schools. As the title of the program suggests, the field of enquiry and learning consists of technology-based and art-inspired artifacts of various kinds, such as inter- or reactive artifacts and systems, dynamic urban events and participatory media projects. ArT

focuses mainly on participatory projects that involve an audience in the unfolding of the artifact or project. Many ArT projects attempt to actively participate in, operationalize and create social interactions. Furthermore, student projects address issues like sustainability, art and health care and disadvantaged neighborhoods.

ArT student projects are most often framed by set constraints in terms of theme, material or technology in accordance with a semester's learning goals. In most cases, ArT student groups begin with brainstorming leading to initial artistic ideas. One of my supervised groups decided to work with doors and an urban space in the middle of our city Aalborg. There was no analytical or scientifically motivated connection between these two ideas (doors and urban spaces). To place a door in the middle of a public space is an initial form decision and a division of spaces (i.e., inside/outside, private/public, open/concealed and confined/unconfined). If this project should have relied solely on artistic methods, the artist(s) would have continued making decisions on the basis of personal inspiration and positioning. However, the group had to imply audience participation in the form of communicative acts within a designed interaction system that included digital technology, the participating audience's conceptual understandings and practical actions. On the face of it, form decisions based on artistic inspiration seem insufficient. ArT students must be able to analyze social spaces and situations. A place can be analyzed by applying the analytical methods used in, for example, urban studies or ethnography (e.g., functional and historical aspects, user flow analysis, interviews). The findings would describe the specificity of this place and its usage.

Thus, one fundamental aim of ArT is the integration of academic and artistic methods. Each student project must decide what methods to apply, often by choosing from a variety of existing academic and artistic methods. Especially in an educational context, the question of the interplay between practice and theory is important and manifold and therefore complex. My experience shows that discussions of which methods to teach and apply and the weighing between theory-based and practice-based methods is often tainted by (art) ideology, personal training and the concrete project at hand. However, my objective here is not to take away this complexity, but to find a theoretical foundation upon which the complex relationship between academic and artistic methods can thrive and which can function as a kind of pragmatic code that helps select to choose among and integrate existing artistic and academic-scientific methods.

## THE RELATIONSHIP BETWEEN ARTISTIC AND SCIENTIFIC METHODOLOGIES RECONSIDERED

Although ArT is a new initiative in Denmark, the phrase 'art and

technology' has been used in the Anglo-Saxon world (e.g., England, the U.S., Australia) for many years to refer to an array of educational programs and research fields. In these countries, art education has been part of the university system as well as research fields and communities for decades. [1] This situation has changed various art practices and, in turn, modified and extended various scientific methods. Singerman argues, on the one hand, that art has become more conceptual and has abandoned its Kantian heritage of aesthetic purposelessness and judgment. With regard to electronic art, media art and emerging bio art, collaborations between artistic and scientific discourses have created not only novel art forms but also new exhibition domains and presentation formats that lie outside of traditional art institutions and venues. On the other hand, a growing body of literature on art-based research has demonstrated the expansion of scientific methodologies through the usage of artistic methods and/or artworks, especially in the fields of sociology, psychology and the humanities. [2], [3]

Nonetheless, the distinction and integration of artistic and scientific methodologies requires an on-going discussion, simply because this integration does not come easily. Various conferences/symposiums addressing the intersection of art, technology and science (ISEA, DAC, Ars Electronica, etc.) confirm that differences in discourses and methods elicit ongoing discussions and also frustrations (at least on a theoretical level). In this context, ArT as an education and research field is compelled to define itself in contrast to artistic research conducted by art academies, on the one hand and in relation to the humanist-hermeneutic, sociological and natural science research discourses, on the other hand. ArT's foundational issues, challenges and opportunities appear to arise from these demarcations.

Of course, there are weighty socio-historical reasons for this divide. According to the sociologist Luhmann, [4] an artwork is defined by forming part of a particular social system, the system of art, which operates according to socially constructed codes, programs and media other than, for example, the system of science. Furthermore, the societal purposes of these two systems have been distinct. The purpose of art traditionally includes the creation of concrete, aesthetic experiences, whereas the scientific system pursues knowledge, primarily in the form of abstractions and generalizations (theories). It is not difficult to describe academic strategies because all academic disciplines must account for their methodologies. The humanities traditionally work with phenomenological-hermeneutic methods, in which an object (a text, artwork, music and so on) is interpreted by means of a hermeneutic spiral (or circle). Sociology employs an arsenal of quantitative and qualitative empirical methods in studies of demographic, ethnic and socio-cultural issues. Natural science promotes the scientific method, which is the verification or falsification of hypotheses by means of experiments and precise measurements. However, there exists a vast variety of

mixed or otherwise synthesized methodologies.

According to Luhmann, the system of art affords the showing of the world in the world, which includes possible but unrealized 'worlds.' In contrast, the system of science generates relatively stable factual knowledge about the existing world. [4] Art seems to work with subjective, personal experiences and interpretation. Artists are said to create by means of personal inspiration, visions and trajectories. Furthermore, an art audience is free to interpret and judge works of art subjectively (as noted by many philosophers, such as Baumgarten, Kant, Hume, Hutcheson and Hegel). [5 - 9] During the 20th century, art broadened its field by incorporating several other purposes and strategies than aesthetics (as the sentiment of beauty) such as political, social, self-referential, personal and collaborative issues. Nonetheless, contemporary artistic methods remain personal; and artists work on the basis of self-generated individual methods intended to produce singular works of art that are different from all other works of art. The *poietic* process, from idea conception to the production of work, is said to exceed the discursive logic of science. The artist uses her- or himself as a kind of transformation filter where empirical perceptions are transformed by virtue of a by Bergson inspired notion of intuition. [10] There is no shortage of metaphors for the artistic process; such as travel, sudden revelation, chance (serendipity) and fight. Artistic crafts, such as knowledge of materials and processing techniques or comprehension of other art forms, are seen as a necessary basis, which artistic inspiration must transcend to uncover novel, surprising or critical perspectives and dimensions of the world. [11]

Wilson summarizes the divide in his seminal book *Information Art*, allocating the notions of reason, normativity, explanation, validity and verification to science, whereas art is characterized by terms such as emotion, intuition and evocativeness. [12] Others have described this difference in similar ways: Eisner as "tension" Borgdorff as the field of the "unknown" and Polanyi as so-called 'tacit knowledge.' [13 - 16] Nevertheless, the divide becomes even more complex when we add the difference between the numerous scientific discourses and methodologies from the humanities, sociology, engineering and natural sciences. Stated differently, the very concept of art-based education (and research) is based upon a socio-historical paradox. On the one hand, these kinds of projects apply artistic creativity and investigation that can only thrive within the protected 'purposeless' field of art. On the other hand though, these projects cannot respect the autonomy of art because it is goal-led solutions to known questions. How, then, can we combine and amalgamate academic and artistic methods that respect art's autonomous status and simultaneously apply it to other fields?

### CONSTRUCTING A WORLD

It seems clear that art-technology projects must find potential meeting points that are capable of coupling the two social domains of art and academia and also bridging the discursive divide between the various academic disciplines. Wilson, for

example, suggests creativity and the objective of improving the status quo. Relying on critical theory, Wilson states that the foundational beliefs of science have been dismantled during the last century; science is dependent on existing cultural values and symbols and on the observer's position in relation to the observed world. There are no truths, only constructions of theories that can explain the world until new and better explanatory truths are found or constructed. This insight seems to open the theoretical field for inter-methodical approaches. Of course, this is old news. Constructivism has long claimed that scientific truths are social constructions (see for example, Piaget, Glasersfeld, Bateson, Luhmann and many others), following Vico's dictum, *Verum factum*. [17] Pickering has described science as a constructionist enterprise in which different agents (e.g., materials and humans) are involved in creation processes. [18] Pickering emphasized practice as the *modus operandi* of material and human agency. The incorporation of artistic processes and artistic products into sociological projects inevitably turns them into action research. [19], [20]

In fact, many interdisciplinary (and transdisciplinary) art and technology projects have led to the emergence of not only novel technologies and solutions but also novel methods in scientific research and especially in art. I am referring to collaborations between, for example, Blast Theory and the Mixed Reality Lab at the University of Nottingham University or Stelarc's collaborations with various medical institutes that have led to the construction of a third arm or the growing of an extra ear. Why, then, should we continue to discuss the distinction between artistic and scientific discourses when reality has already bypassed these theoretical, categorical atavisms? It seems that practice has found solutions to their specific problems, whereas their generalizations on a theoretical level still create methodological problems.

My challenge is that an academic paper (such as this one) can only operate on a theoretical level by attempting to find theories and abstract demarcations and relations that help to conceptualize the possibilities of inter-methodological approaches. Therefore, my research question must be whether the distinction between scientific and artistic remains operational or whether there is another additional distinction that can solve this theoretical problem and elucidate how ArT projects, being part of an interdisciplinary education, can choose among and apply artistic and academic-scientific methods. Put differently, is there an additional distinction that could operate as a program to lead or advise the deployment of artistic and academic methods in educational and research projects and that could overcome the ideologically tainted battle between art and science?

As the additional operational distinction, I propose Luhmann's distinction between medium and form. Before presenting Luhmann's distinction, the ability of art to employ this distinction in a special way and elaborating on its application to my field of

inquiry, let me present an account of art-technology projects and their evolving subject field to provide a clearer and more concrete understanding of the field and its methodological challenges.

### MEDIUM AND FORM

Niklas Luhmann (1927-1998) sees art from a sociological perspective. Works of art form part of a social function system (and is produced by this social system) that yield a specific kind of observation modus. Art is defined by form selections that uncover the contingencies of these selections or, put differently, the interdependence between actuality and possibility and this is observed by the onlooker. This does not mean that artworks consist of unconditioned form choices (as many critics of modern art have misunderstood). Instead, it means that art operates by showing potential formations, thereby uncovering the foundational contingency of 'the world' (the world is always the result of observations and is an operational part of the observer). Luhmann can thus postulate that art's social function is to show the world within the world. At the end of his voluminous book on art, he asserts, "Art experiments with fictional yet real arrangements in order to show the society within the society that there are alternatives, but precisely not arbitrary alternatives." [21] Obviously, this can be done in many ways. Expressed more technically: art and works of art make it possible to 'see' through or beyond the (re-)presented forms into an implied but unknown space that can be used for further (imagined or realized) form modulations.

To understand this very abstract proposition, we must understand Luhmann's distinction between medium and form and art's specific manner of managing this difference. He proposes that the distinction between medium and form is a relative distinction; it is not an essential, ontological distinction but one that designates two different modalities. Media is "[...] characterize[d] by their high degree of dissolubility together with the receptive capacity for fixations of shapes (Gestalt). This means media also consist of elements or events in the time dimension, but these elements are only loosely coupled." [22] The relative difference between medium and form is the creation of form through the relational fixation of a selection of the medium's elements. The distinction and dependency between medium and form holds true in many domains. Noise, for example, is a structured constellation of elements that make up air (sound waves). Air is a medium that can transmit noise precisely because it is invisible (inaudible) as a medium. Consequently, a medium cannot be observed directly but can only be inferred through form. "Despite all these relativizations, the difference between medium and form remains decisive as *difference*." [23]

Luhmann claims that art handles this difference in a special manner. Art creates its own medium in that every artistic creation (form) produces its medium. Art (making) turns our normal apprehension of the primacy of a medium upside-down by producing its own medium. This medium is not something new (because all art and art making relies on existing, primary media

such as air, materials, colors). The artistic medium is generated as the difference between medium and form. Art's medium is the very distinction between medium and form. Luhmann explains this using several examples, but one will suffice for my context. Music, he states, is received as a structured composition of sounds. The difference between everyday sounds, such as a telephone ringing or a barking dog, is that music "creates its own reservoir of selections, a space of meaningful compositional possibilities, which the specific work uses in a way which is recognizable as selection and which does not restrict other compositions." He continues, "[h]ere too through particular arrangements, a medium is again first of all created in which form can imprint itself." [24] Music can only be appreciated by those who can see (feel) that a musical composition (form) is not the only possible composition; rather, every composition forms an entrance into a realm of other possible, but not arbitrary, arrangements. In abstract terms, these possible but unrealized arrangements point at the difference between medium and form. Every singular artistic form (piece of art) makes apparent that difference as potentiality field. Luhmann furthermore claims that only art(-istic) form can reveal its medium (as the difference between medium and form).

Luhmann's specification of artistic medium as the difference between form and medium is a theoretically interesting account of art's capability to produce and communicate creation and creativity. But he also asserts that we cannot observe (create) an artistic medium without the primacy of form. Here, he unfortunately echoes the view that artistic creation is an impenetrable occurrence that reveals its medium (and its significance) post factum. In my opinion, artistic creativity is not exclusively dependent on the artistic genius but must also be seen as a system-inherent operational mechanism of the system of art. For example, every piece of art is informed by established artistic form(at)s and styles (already uncovering these artforms' mediums) and by the surrounding society in order to be recognizable and valuable. In other words, a work of art has to show its medium as potentially de-coupled elements. Seen from the angle of the artist, the process of art making (form fixation) can only be based upon acts of de-coupling. Thus, artistic form fixations must be understood as new-couplings.

### SOCIETY AS MEDIUM

An additional aspect is important for my investigation: one primary medium used by many ArT projects is a concrete societal context, be it an urban space and its components, prospective users in participatory projects, etc. This, of course, is not new to art: "Finally, since the nineteenth century, we can observe tendencies to constitute with the aid of art a further medium: society." [25] This became possible because society was no longer seen as nature or creation but as the result of social evolution. Society produces itself by identifying, selecting, (re-)combining and creating its own elements. The social subsystems of science and art participate in the 'medialization' (the uncoupling of societal elements) and re-formation of society. Put very broadly, science

investigates society by means of various kinds of data collection and data interpretation with the goal of forming theories that can describe and explain dimensions of 'the world.' To be of value, these theories must be applicable to specific situations. Methods regulate not only data collection but also the application of theories in order to determine the accuracy (truth) of the findings. This process however is never purely descriptive; it constructs the (or rather 'a') world and our understanding of it. What concerns art, Luhmann is referring to modernist art that actively had been commenting on, criticizing and even wanting to modify society. In doing so, art had to acknowledge and problematize itself as part of society, which in some cases has led to solipsistic recursions. Self-reflectivity has become modern art's medium.

On the contrary, art and technology projects at Aalborg University seem to have abandoned self-reflectivity as their medium, because these projects are using concrete 'social fields' (spaces, situations, user behaviors, etc.) in their attempt to find alternative questions or even identify possible solutions to concrete and existing challenges. They are building alternative social situations. Tentatively, the interlacing between academic-scientific and artistic methods consists in divisions of labor: scientific methods partake in the de-coupling (mapping out) and re-coupling (interpretation) process of these fields, meanwhile artistic methods participate in intermediary and final form-finding processes (new-coupling) that reveal not only new perspectives on the subject matter in question but also novel mediums. Thus, the area of convergence can be characterized as the dependency between the un-coupling, re-coupling and new-coupling of the constituents of a particular subject field.

In what follows, I will examine two student projects with the goal of scrutinizing possible 'inter-methodical' strategies on the basis of the form-medium distinction.

### DE-, RE- AND NEW-COUPLING AS CODE FOR INTER-METHODICAL PROJECTS

As already presented in the beginning of this paper, the ArT student group working started out by conceptually positing a door in a defined urban space. To repeat, to place a door in the middle of a public space is an initial form decision that makes apparent the mediums with which the project would work: the division of spaces (i.e., inside/outside, private/public, open/concealed and confined/unconfined). These distinctions opened up fields of inquiry in that the students would investigate the socially accepted concepts (private as opposed to public; inside as opposed to outside, etc.). This is important, because form decisions based on artistic inspiration are insufficient, if the group had to imply audience participation in the form of communicative acts within a designed interaction system that would include the participating audience's conceptual understandings and practical actions. In the same way that art painting requires a technological understanding of what paint is, ArT students must be able to analyze social spaces and situations by applying academic

methods (e.g., functional and historical aspects, user flow, interviews etc.).

These types of analytical tools transform the place into a medium. During this process, objects, spatial conditions, historical facts and actual and prospective users become de-coupled constituents with which the group can work. In this regard, also theories of the human sciences, such as theoretical aesthetics, perception theory and theory of mind, contribute to the 'medialization' of social situations, because they can be used as filters through which makes observation possible in the first place.

But we must be aware of that academic findings always appear in the form of theories, categorizations and generalizations – that is, as form. Nevertheless, considered as aspects of an inter-methodical process, these types of findings are potentialities rather than fixations. Employed as de-coupling strategies, there is no danger that academic practices will overrule the artistic process. On the contrary, academic methods and their results can further, catalyze, support and 'irritate' artistic explorations because these findings broaden the potential field of novel form fixations.

The group of students decided to focus on the thematic distinction between private and public because they wanted to transform the chosen cramped public space into a personal retreat in the middle of a busy urban area. They designed a small hut around one half of a normal park bench, while the other half of the bench remained outside and thus part of the public space. The ambiguity the park bench was thus exaggerated. The idea of the divided bench folds the private space into the public space and vice versa. To further the complexity of the private/public relationship, the students furnished the public space with pillows, flower vases and other elements of private spaces, whereas the inside of the shed was white with no additional objects except an old-fashioned telephone. Unfortunately, the student group used the number pad of the telephone as a simple interface device to give users the ability to create their own personal space by changing the hue of the inside lighting and by choosing from a range of soundscapes. In my opinion, simple research into technological, media-theoretical and sociological aspects of the telephone as a communication device could have created other potential spaces that could have led to far more interesting solutions in the interstices between public and private spheres.

Another example is a student project that consisted a method box designed for user engagement and reflection. The group decided to work in a disadvantaged neighborhood. They consulted existing demographic data and other scientific reports. The neighborhood was situated near the university and its citizens have often been the subjects of research conducted by sociology or psychology students. The ArT students became interested in the subject of observation (e.g., research observation, the large amount of surveillance cameras and their own role). They created a cultural probe box for one person at a time that specified actions in front

of surveillance cameras, Xbox cameras and the personal cameras to ignite a process of participant action and reflections dealing with the participant's own self-image, role and position within that housing area and the society at large. Scientific methods (various observation strategies, questionnaires and cultural probes) were transformed into an artistic event. The de- and re-coupling process was not altered but put into an artistic context. The participant, firstly, enacted the collection of data and, secondly, acted in front of surveillance cameras thereby transforming the purpose of surveillance into deliberate statements. The method box not only gave the participants the ability to explore their own neighborhood in a different manner but also uncovered the formational strategies involved in the production of scientific and public images of such a disadvantaged area. By doing so, the project uncovered a potential space for other investigation strategies and empowered the participants by presenting possible means of action and reflection. In other words, it constituted a platform for potential new-couplings of the elements of a disadvantaged neighborhood.

## CONCLUSION

Decoupling, recoupling and new-coupling cycles are not equivalent to "the reflective practitioner" and reflective practice, as proposed by, for example, Schön. [26] Schön investigates the reflective modus of practice that differs from what he calls technical rationality. The inter-methodological challenge this paper addresses lies in the relationships and circular interferences between the artistic approach (as defined above) and academic analytical methods. De-, re- and new-coupling cycles do not aim for synthesis and the emergence of novel methodologies but rather for a fertile interference that is beneficial for concept development and the realization of artistic projects within the field of art and technology. Luhmann's notions of medium and form as relative difference are seen as theoretical tools that can explain the complex relationship between artistic and academic-scientific methods and can be used as heuristic, reflective tools in the choice of methods.

## REFERENCES

1. Howard Singerman, *Art Subject* (Berkeley: University of California Press, 1999).
2. Gary J. Knowles & Andra L. Cole, *Handbook of the Arts in Qualitative Research* (Los Angeles and London: SAGE, 2008) 29-40.
3. Patricia Leavy, *Method meets Art* (New York: The Guilford Press, 2009).
4. Niklas Luhmann, *Art as a Social System*, trans. Eva M. Knodt (Stanford, Calif.: Stanford University Press, 2000).
5. Alexander Baumgarten, *Theoretische Ästhetik – Die grundlegenden Abschnitte aus der "Aesthetica"* (Hamburg: Felix Meiner Verlag, 1750/1988).
6. Immanuel Kant, *Critique of Judgement* (Oxford: Oxford World's Classic, 1952/2008).
7. David Hume, "Of the standard of taste" in Hume, D. 2008. *Selected Essays* (Oxford: Oxford Paperbacks, 1757).
8. Francis Hutcheson, , *An Inquiry into the Original of Our Ideas of Beauty*

- and Virtue, W. Leidhold (ed.) (Indianapolis: Liberty Fund, 1726/2004).
9. G.W.F. Hegel, *Philosophie der Kunst* (Frankfurt a. M: suhrkamp, 2005).
  10. Shaun McNiff, *Art-Based Research* (London: Jessica Kingsley Publishers, 1998).
  11. Yvonna Lincol and Norman Denzin, "The Revolution Presentation" in Lincol & Denzin (eds.) *Turning Points in Qualitative Research: Tying Knots in a Handkerchief* (Walnut Creek: AltaMira Press, 2003), 375–378.
  12. Stephen Wilson, *Information Arts - Intersections of Art, Science and Technology* (Cambridge, Mass.: MIT Press, 2002).
  13. Elliot Eisner, „ 2Presistent Tensions in Art-Based Research" in *Arts-Based Research in Education*. ed. Melisa Cahnmann-Taylor, Richard Siegesmund (New York: Routledge, 2008), 16-27.
  14. Henk Borgdorff, "Artistic Research and Academia: An Uneasy Relationship." In: Torbjörn Lind (ed.) *Autonomi och egenart : konstnärlig forskning söker identitet. [Autonomy and Individuality - Artistic Research Seeks an Identity]. Årsbok KFoU (Yearbook for Artistic Research)*, Stockholm: Vetenskapsrådet (Swedish Research Council, 2008), 82-97.
  15. Michael Polanyi, *The Tacit Dimension* (Garden City, NY: Doubleday and Company, 1966).
  16. Ken Friedman, "Research into, by and for design" *Journal of Visual Arts Practice* Volume 7 Number 2, (Intellect Ltd, 2008).
  17. Thomas G. Bergin and Max H. Fisch, *The New Science of Giambattista Vico*, revised translations of the third edition of 1744 (Ithaca: Cornell University Press, 1948).
  18. Andrew Pickering, *The Cybernetic Brain: Sketches of Another Future* (Chicago: The University of Chicago Press, 2010).
  19. Patricia Leavy, *Method meets Art* (New York: The Guilford Press, 2009).
  20. Susan Finley, "Art-based research" in Knowles, Gary; Cole, Ardra, *Handbook of the Arts in Qualitative Research* (Thousand Oaks: Sage Publication, 2008).
  21. Niklas Luhmann, *Die Kunst der Gesellschaft* (Frankfurt: Suhrkamp, 1995). xx.
  22. Niklas Luhmann, "The Medium of Art" in *Thesis Eleven* 18-19 (Sage Publication, 1987), 102.
  23. *Ibid.*, 103.
  24. *Ibid.*, 105.
  25. *Ibid.*, 107.
  26. Donald Schön, *The Reflective Practitioner: How professionals think in action* (London: Temple Smith, 1983).