ABSTRACT

Interdisciplinary research has become more mainstream in the academia as of late. Gilles Deleuze’s theories, especially his critical insight into the relationship between science and art may open new avenues for this kind of research. Deleuze’s ideas are significant, not only because he provides a framework for thinking about nomadic science, but he also clarifies possible criteria for assessing the nature of interdisciplinary experiments. Art “organizes” this chaos in a frame to form a composed chaos that becomes sensory/affective/intensive, but science “organizes” the same chaos into a system of coordinates and forms of measure that produce the appearance of “Nature.” Art and science, in this model, can intersect and intertwine, but Gilles Deleuze and Félix Guattari never suggest there can be a perfect synthesis between the two. Instead, we can associate the two kinds of creative activities in terms of neighboring planes: planes of composition for art and planes of reference for science. The goal of this paper is to argue that Deleuze and Guattari characterize the interaction between these two planes as one of interference rather than synthesis and shed new light on arts-based research in terms of the three interferences.

KEYWORDS

deleuze, art, science, planes, interference, arts-based research

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INTRODUCTION

Cross-disciplinary, interdisciplin ary, and transdisciplinary research refer, in some way, to research that crosses disciplinary boundaries and enables interactivity between disciplines. Over time, these boundary-defying approaches have become more prevalent in and beyond academic disciplines. As practices, these approaches involve collaboration and interaction between researchers from different fields. Through thinking across boundaries, different perspectives, skills, and knowledge create something new that would not be possible within any particular discipline. New fields become possible such as neurophenomenology, which brings together phenomenology and neuroscience, or new approaches to arts-based research, research creation, and practice-based research all reflect attempts to find compelling collaborations between art and various sciences. The digital humanities is another field in which we can find discipline-defying approaches to knowledge creation and distribution through the intersection of humanities and digital technologies.

Meanwhile, these practices face challenges and difficulties. Organizations that promote boundary-defying research may have difficulties providing effective guidance and criteria for evaluating the collaborative work. There are challenges not only in assessing this research but also in addressing fundamental epistemological incompatibilities that might exist between them. One example is the integration of art and science. How should we understand the interrelationships between art and science? What does the term “transdisciplinary” mean in the context of evaluation? In collaborative work, how do participants of a transdisciplinary project handle their different responsibilities and methods? More often than not, scientific notions of validity trump artistic notions of creative expression or aesthetic sensibilities. Or, if art and science are placed on equal footing, there is still the problem of incompatibility between various notions of “success” or “failure” that are not easily resolved through simple hybridization of criteria.

Art and science are distinct activities of creativity that serve as different modes of thinking generally. In order to clarify the relationship between art and science, it is important to understand possible obstacles in hybridizing or synthesizing the two. In this article, I will argue that Deleuze and Guattari can be used to pinpoint the exact differences, incompatibilities and interference between art and science. On the one hand, Deleuze studied many subjects throughout his life, including film, literature, painting, mathematics, and so on. Deleuze’s approach therefore can be read as an exemplar of boundary-defying research. In this sense, it might appear that Deleuze himself ignored differences between art, science, and philosophy. If one uses Deleuze’s own practice of philosophizing as a model for transdisciplinary experimentation, then it might appear that conflicts between different disciplines are easily dismissed for rhizomatic play. On the other hand, Deleuze addresses his understanding of art and science and the difference between them in many places. For example, in Anti-Oedipus (1983), he talks about his understanding of science in terms of force; in Francis Bacon: The Logic of Sensation (2003), he uses Francis Bacon as an example to illustrate his understanding of art. In both cases, distinctions are emphasized between science and art. In their last book, What is Philosophy? (1994), Deleuze and Guattari most directly and fully address the key differences between art, science, and philosophy. When read carefully, this last book helps clarify a key point in how Deleuze utilizes art, science, and philosophy throughout the writing. Counter to those who merely see Deleuze’s various experiments in boundary-defying research as endorsing hybridization between art and science, I argue that what is really at stake is something else entirely: a research model or category that emerges from interference with any process of synthesis. In this sense, the intensity of interference between disciplines needs to be rethought less as an obstacle and more as evidence of the effectiveness of any given boundary-defying project.

Moreover, Deleuze’s understanding of science and art is related to the notion of creation, which reflects the most concentrated and essential parts of Deleuze’s thought. For Deleuze, the main question is always: what makes creation possible? He thinks about the roots of creation in the gaps between different experiences. In Difference and Repetition, Deleuze (1994) writes, “It is as though there were an ‘opening’, a ‘gap’, an ontological ‘fold’ which relates being and the question to one another. In this relation, being is difference itself. (p. 64) Put it simply, difference emerges from the “folds” of different fields. In a sense, art and science can be seen as examples of creative acts with difference, but there is a more complicated relationship between art and science. As a philosopher of difference, Deleuze uses art and science to explain his method to develop a new philosophy. As Deleuze describes in his work, Difference and Repetition (1994), “I make, remake and unmake my concepts along a moving horizon, from an always decentered center,
from an always displaced periphery which repeats and differentiates them” (p. xxi). Through the process of making, remaking and unmaking, Deleuze is concerned not with hybridizing but with points or folds of interference that disrupt boundaries and create strange, anomalous exceptions.

Deleuze’s understanding of art and science and their relationship is scattered throughout his philosophical writings, and it has been explored by many scholars in different fields. For example, Isabelle Stengers (2005) specifically highlights how Deleuze’s ontology allows transdisciplinary research. In bringing together art and science, scholars have embraced this perspective, experimenting with various criteria for how the two might intersect. Arkady Plotnitsky (2012) addresses the concepts of resonance and interference in Deleuze and Guattari’s philosophy in terms of the relationship between art, science and philosophy. Gavin Rae (2020) also recognizes the importance of the relationship between philosophy, science, and art and how philosophical, scientific, and aesthetic thinking contribute to the multiplicity of paradigms offered in the academy. However, the discussion of Deleuze’s idea on art and science is not adequate in the secondary literature. Deleuze’s own writing on art and science is relatively ignored. In this sense, it is still necessary to clarify the difference between art and science from a Deleuze’s perspective and explore how Deleuze’s idea is significant for disciplinary-defying research. In this paper, I aim to outline how Deleuze and Guattari treat art and science as independent entities and ontological categories, and then how art and science are possibly interconnected through their notion of interference.

**PLANES OF ART AND SCIENCE**

In Deleuze's view, philosophy, science, and art are distinguished by their different approaches to chaos. Chaos might be viewed here as a potential out of which, art, science, and philosophy can emerge. At stake in each discipline is how chaos is fundamentally approached. In this section, I will outline Deleuze’s notion of art and science as well as their characteristics and purpose and how they function differently. First, I want to clarify the term “plane” in his writing. It might be worthy to note that Deleuze’s concept of “plane” is not used in the way we commonly understand. As far as I understand, plane is not an empirical space, but a virtual space where art, science, and philosophy can occupy with each other. For Deleuze, the plane is described as a “prephilosophical” terrain of thought and feeling that produces “nonconceptual understanding” (Deleuze, 1994, p. 40) out of chaos. A plane is a “section of chaos” that “requires a creation” (Deleuze, 1994, p. 42). Art, science, and philosophy each have their own planes. These planes lend the disciplines their baseline “nonconceptual understanding” (Deleuze, 1994, p. 40) that lends the various concepts, functions, or affects located on a particular plane their constancy and intensity.

In Deleuze and Guattari’s description, art as a discipline is situated on a plane of composition. There are vibrations, percepts, and affects circulating on the plane of composition. Art draws upon these forces, creating sets of combinatorials. As they bind and group together, they form sensations, and then these sensations create territories on the plane of composition. For instance, one can reference the aesthetic labor of birds. Birds build a nest not only to serve as a functional house, but to bring together certain cosmic forces into blocs of sensation. A nest is an aesthetic work as it has a certain feel, look, and style and thus it is not simply a biological work. The necessity of nest building (as biologically determined) becomes a creative act as manifest in the particular aesthetic qualities of each nest. This invention turns sensation, rhythms, and vibrations into a territory defined in terms of aesthetic sensations. The territory is a frame that makes art possible. In this sense, a painting and a nest are equivalent for people and birds. Yet, the transformation does not explain the emergence of a territory, rather, it is the other way around: the territory implies the emergence of sensory qualities that detach from a purpose or function, to produce some kind of excess of pure sensations not reducible to mere biological reflexes.

For Deleuze and Guattari, art is neither representation nor perception, but the visualization of cosmological force, which they call an inhuman force. For Merleau-Ponty, perception concerns the everyday interactions between body and world; but for Deleuze, the force of the universe affects us beyond our everyday, worldly interactions and perceptions. To go further, sensation is not the flesh in Merleau-Ponty’s sense, but a compound of non-human forces, or humanity’s non-human becoming. For example, there is a cosmological force beyond humanity’s everyday perception and recognition. Genres such as cosmic horror in the arts testify to the presence of these unimaginable powers that lurk in the darkness beyond the world of human actions and meanings. The body seems to disappear; there is no flesh, only the sensation of terror when faced with the nonsense of cosmic forces.
For Deleuze, art is no longer of representation of something, but a medium to make invisible forces sensible. Deleuze uses Paul Klee as an example to explain the power of sensation, “not to render the visible, but to render visible,” (Deleuze, 2003, p. 56). As Deleuze and Guattari describe, art produces and intensifying sensations of these non-human, cosmic forces. Art exceeds itself and produces sensation through affects and precepts. “Art enables matter to become expressive, to not just satisfy, but to also be more than itself” (Grosz, 2008, p. 4). Music, visual art, architecture, dancing, performance, all of these are forms of creative action that produce sensations by attempting to touch inhuman, cosmic energies, forces, and powers.

Deleuze and Guattari state that art is a monument that can extract and preserve sensation. “By means of the material, the aim of art is to wrest the percept from perceptions of objects and the states of a perceiving subject, to wrest the affect from affection as the transition from one state to another: to extract a bloc of sensations, a pure being of sensations” (Deleuze & Guattari, 1994, p. 167). Art is an attempt to frame this “bloc of sensations.” For Deleuze, a work of art can preserve itself, and the preservation is a combination of perception and feeling; artists create feelings and clusters of feelings through works of art. “Art is the regulation and organization of its material—paint, canvas, concrete, steel, marble, words, sounds, bodily movements, indeed any material” (Grosz, 2008, p. 4). All of these materials contribute to the creation and generate sensations that affect the living body.

As opposed to art, science deals with the world and its state of affairs and is located on the “plane of reference” (Deleuze, 1994, p. 118). The plane of reference imposes limits and borders on chaos. Whereas art intensifies cosmic forces, science attempts to measure and create limits. Science does so through the production of functions (instead of affects). For Deleuze, “function is a slow-motion” (1994, p. 118). A function sets speed limits “that cannot go beyond” (p. 118) such as the speed of light or universal laws of physics. Instead of a plane of creative events (as with art and philosophy), the plane of reference is a plane of predictable patterns or limits in which the “references” are internal limits (such as logical rules or axioms in mathematics) or external limits (such as external variables in the sciences). Science tries to remove the ambiguity of reality by creating functions that have a certain amount of predictability and reproducibility.

As Deleuze and Guattari (1994) write, “Scientific observers [...] are points of view on things” (p. 132). In this sense, the “scientist” is not an individual so much as a function within a scientific discourse located on a plane of reference. Science is a framework we see through and is therefore not neutral but rather a perspective, hence the importance of Deleuze and Guattari’s notion of the “partial observer.” There is no view from nowhere possible in science. Experiments are set up in a certain way, and the setup and circumstances determine what can be observed. A milieu, a situation, or a condition for observing is set up for partial observers to perceive and observe. Observation is not done by scientific workers as individuals, but rather as part of the work they are engaged in, which is conditioned not only by the concrete experimental situation but also by the plane of reference that define what can and cannot be observed and measured (remember, this plane always sets limits).

In short, the foundation of science is to define a frame of reference. Science always uses the function to constantly bring an event, a thing or an object into reality in a state of affairs where measurement is possible. “Science gives a reference to the virtual, which actualizes it through functions” (Deleuze & Guattari, 1994, p. 118). As partial observers, scientists do not produce the results of experiments, but create the functions out of observations and verifications. As Deleuze and Guattari point out “Science brings light to partial observations in relation to function within systems of reference” (1994, p. 129).

INTERFERENCES AND ARTS-BASED RESEARCH

As one can see, art and science are very different practices operating on and through different planes that are composed of different elements. This begs the question: Given these differences, how do the two disciplines intersect (if at all)? Here one can remember Deleuze’s own philosophical writings. They illustrate the possibility for some kind of interaction between different planes, but it is the nature and quality of this interaction that remains to be determined. In this part, I will argue that there are three forms of interference defining the potential interaction between art and science. In particular, I will turn to arts-based research as a specific example of how such interference plays out in relation to a boundary-defying practice. In recent years, Deleuze’s idea has been introduced and developed in relation to arts-based research (Jagodzinski, 2016; Jagodzinski & Wallin 2013; Irwin...
et al., 2006; Lewis, 2020). Indeed, within these Deleuzian-inspired forms of arts-based research, Deleuze is utilized to provide philosophical grounds for experimentation with the relationship between scientific and artistic practices under the heading of “research”. I want to add to this existing literature on Deleuze and arts-based research in relation to the question of interference. It is my argument that existing literature on Deleuze and arts-based research has thus far failed to acknowledge the importance of the concept of interference as a way to evaluate the productivity of arts-based research projects.

For Deleuze and Guattari, there are three different kinds of interference. The first interference is an extrinsic interference. Deleuze and Guattari (1994) define extrinsic interference as follows: “each discipline remains on its own plane and utilizes its own elements” (p. 217). In Deleuze’s description, art works on the plane of composition and science works on the plane of reference as I have explained above. In science, there is the plane of reference, function, partial observer; in art, there is the plane of composition, sensation, aesthetic figures. Each discipline works on different planes with different elements. This extrinsic interference in Deleuze and Guattari’s writing will clarify the different goals, definition and methods between art and science. The extrinsic interference between art and science exists because different elements are utilized on different planes. Interference is due to the fact that each field has its own plane with its own method. Deleuze and Guattari (1994) emphasize that in extrinsic interference “[…] the rule is that the interfering discipline must proceed with its own methods” (p. 217). The method is the result of the independence of each discipline. A possible example of this kind of interference might be the work of artist Georges Seurat whose pointillism appropriated certain scientific functions of optics. Or, in reverse, Deleuze and Guattari cite various scientists such as Gustav Fechner who attempted to create functions of to account for color patterns. In both cases, the interferer remains on his or her plane and imports an external affect, concept, or function onto that plane. While this might produce interesting forms of interference, there is a worry: External interference will always directly or indirectly privilege one plane over another, one discipline over another. This is a serious concern within arts-based research where there might be a tendency for the arts to be imported into science in order to serve as illustration. This tendency can be seen in the work of Barbara Fish (2012) who, on my reading, utilizes art to illustrate certain phenomenological stories. The art might act as evidence, but what counts as evidence is based on the scientific method of investigation. Thus, art aids the inquiry without necessary challenging the fundamental organization of the plane of reference upon which the inquiry is situated.

In the second form of interference is referred to as “intrinsic” (Deleuze, 1994, p. 217). This form of interference is more intensive in that it is not simply elements from one plane transplanted into another plane. Instead, a point of view from one plane “slides” into another plane so that the very appearance of what is possible on the plane shifts. As Deleuze and Guattari (1994) explain, “partial observers introduce into science sensibilia that are sometimes close to aesthetic figures on a mixed plane” (p. 217). Deleuze and Guattari cite as an example Duchamp who covertly smuggled into art the point of view of the scientific partial observer, creating a fundamentally new way of viewing the discipline of art as a whole that creates new kinds of questions not asked previously on a given plane.

Interaction and collaboration between art and science are not something new. Leonardo da Vinci’s meticulous observation of human anatomy makes his figure painting perfect; his knowledge of the muscles under the skin also helps make his portrait so aesthetically precise. Santiago Ramon Cajal, the father of neuroscience, was another example that shows artistic practice and scientific research can mutually beneficial. Since the new media and technology develop fast, the interaction between art and science become more common; interdisciplinary research has gain popularity in and beyond academia. Here are some interdisciplinary art project examples that exemplifies the interference between art and science. Artist Olafur Eliasson works intensely in art and science. In his art projects, such as The Weather Project (2003) and Room for One Color (2008), he plays with the knowledge we know about science and creates some new experiences and changes our perceptions. The different use of color and light creates an atmosphere that affects viewers. One more example is the one from scientist Muzlifah Haniffa and her teamwork with artists to explore how cells communicate under the skin. Artists share their ideas, perspectives, and methods and bring more dimensions of things to their scientific research. They turn the gene expression of immune-system cells into sounds and light and transmute their scientific research into multi-sensory artistic forms, that is the multi-component interactive art project, Inside Skin (2016). They had an exhibit of this project in which the au-
ience could feel the light and sounds that came from the cells, which offered new ways to experience and understand the research.

But this second kind of interference is still limited. It introduces new questions and new techniques for thinking or experimenting with these questions, but the plane remains legible as a particular plane. Duchamp for instance introduced new questions into art when he imported the point of view of the partial observer from science and mathematics. The key question for Duchamp might be something like: What constitutes an artistic object? Yet it is important to note that this question remains on the artistic plane. The plane is seen and thought of in a different way, but it remains a specific, localizable plane.

Here, I want to emphasize the third interference. In the third interference, the borders between different disciplinaries become blurred and crossed. Deleuze and Guattari (1994) claim that this is a form of interference that cannot be localized (p. 217). During this kind of interference between art and science, the planes are fundamentally disorganized to the point where it is difficult to measure or preserve them. In this context, the sensation and functions become indiscernible as do partial observers and aesthetic figures. What is produced is nameless. In this way, a new plane becomes possible, a new way of organizing chaos, a new set of questions, and a new mode of territorialization. It is my argument that this third form of interference is the most intense. Its intensity can be glimpsed in how far it pushes recognizability, how far it stretches common and good sense, and how it opens up possibilities that are not configured in either art or science or their various points of view. One possible example of such an approach might be in certain pataphysical experimentations (Lewis & Hyland, 2022). Groups such as Oulipo create literature or poetry with different methods, constrains, and techniques from mathematics and science, producing unrecognizable effects of nonsense beyond the sense found in either art or science. In other words, Oulipo as a special kind of arts-based research disrupts the nonconceptual and intuitive understanding found on various planes that make art and science intelligible.

In sum, defining the criteria to evaluate boundary-crossing research such as arts-based approaches is challenging. But the idea of “interference” could be a new criterion for an “alternative” arts-based research. The question arises: How does the work intensify and extend interference? Perhaps the criterion for evaluation depends on the level of interference. In other words, the more debate around the work might be an indicator of its success in undermining accepted territories of thought and affect. If a work shocks the viewer and does not provide a language or set of tools for its analysis, then one knows that the work is reaching for the highest or most intense form of interference. Although such work might appear as nonsense, it nevertheless could be a strength of the work insofar as it prompts the viewer to ask new kinds of questions, adopt new points of view, and organize new ways of knowing outside of the division between affects, functions, and concepts.

Deleuze and Guattari’s own method might fall in this category of maximal interference. While Deleuze and Guattari argue that they are philosophers producing concepts, it seems that something else is at stake in most of their work, especially A Thousand Plateaus (1987) in which functions, concepts, and affects fold into one another with such intensity and speed that the book as a whole no longer seems to fit within any discipline. This has generated decades of debate over the status of this book, but this could very well be a sign of its success. The book literally enacts a form of research that maximally intensifies its own determinationalization. It is not simply the importation of scientific functions into philosophy. Nor is it simply the slipping of aesthetic figures into the position of the partial observer. Instead, what is produced is an alternative, pataphysical plane of an unknown and unnamed science. Tyson Lewis (2020) has proposed a “pataphysical” turn for arts-based research which disturbs the hierarchies between art and science. In my interpretation, this is a call for arts-based research to orient itself toward experiments to amplify and intensify forms of interference. By doing so, arts-based research can once again find creatively new ways to deal with the chaos of existence.

**CONCLUSION**

Under the context of cross-disciplinary research, art-based researchers have explored various approaches based on the two themes between art and science. As one of the most influential and challenging philosophers of the twentieth century, Deleuze has had a huge impact in the humanities and social science, especially in an increasing wide range of disciplines. Additionally, Deleuze’s own method is illustrated by these interfering relationships between art and science. Deleuze applied what he discussed in his own philosophy.
He borrows concepts from art and science and uses them for his philosophy. Throughout his philosophical theory, Deleuze uses scientific and artistic terms; at the same time, he states that scientists and artists can use his philosophical theories for research within their respective fields. For Deleuze and Guattari, (1994) “Art needs nonart and science needs nonscience” (p. 218). Art and science extend themselves across their nature with their Nos. How to engage with the Nos and vitalize the gap between art and science will be a continued project for cross-disciplinary research. In a word, art-based research should locate the central role of art and reflect on the different methods in cross-disciplinary research.

Additionally, for the future study on this topic, I suggested that the three interferences in Deleuze’s idea can be used to describe art-based research (ABR) as a process of territorialization, deterritorialization and reterritorialization where art and science detach, exchange, and reorganize to form more complex assemblage of elements. Deleuze borrows the term “territorialization” from psychoanalysis and applies it to more fields in his own writing. The terms, territorialization and deterritorialization and are proposed and developed in Deleuze and Guattari’s work. For example, they have been explained in different places in their writing. In *Proust and Sign* (1972), Deleuze uses literature as an example to explain deterritorialization where he treats literature as a minor, which creates the need for something that is not thought or released yet. Perhaps, we can understand the extrinsic interference between art and science as an act of “territorialization,” the intrinsic interference as “deterritorialization” and the unlocalizable interference as “reterritorialization”. ABR, especially in the framework of intrinsic interference and unlocalizable interference, has the power to promote creativity by breaking the boundaries between disciplines, such as art, science, philosophy, literature and so on in a board context and shows a way to avoid the homogenous thinking, or common sense. Deleuze (1994) once writes, “Movement of deterritorialization are inseparable from territories that open onto an elsewhere; and the process of reterritorialization is inseparable from the earth, which restores territories” (p. 86). Different modes of ABR can be categorized under this framework which will help to deeper the connection of Deleuze’s idea with art education and ABR.
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REFERENCES


**FONTS IN USE**

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