Soft robotic telepresence as a mediated incarnation.

Avner Peled.

08/2019

Abstract

This thesis is a post-phenomenological investigation into the use of soft robotic telepresence as a mediating body between humans. Through my own encounters with Palestinians for the purpose of conflict resoluton and through readings of phenomenological and sociological studies, I determine the importance of the physical body, its fleshiness, nonlinearity and organic qualities for the construction of a meaningful and transformative dialog. At first, the broad potential of artistic craftsmanship to assist in political transformation is debated, reaching the conclusion that a scientific perspective could be applied not only to the creation of the piece, but also to the estimation of its societal effect. I then propose the use of soft robots as medium of reembodidemnt that could factilitate massive scale physical encounters between people who are unable to otherwise meet in person. A novel method for the production of soft robotic avatars is introduced, capable of bodily haptics, language translation and animalistic emotional expression, accompanied by a web based software platform for an easy development of applications. Using this method, *Hitodama*, a first prototye for a soft robotic avatar is produced. I perform an intial evaluation of the robot in an encounter between people of different cultures using an example app in which they examine their bias and prejudice of one another. I analyze the results by conducting interviews with the participans, following the principles of interperative phenomenological analysis.

Contents

Introduction **2**

Chapter 1: The Phenomenology of Incarnation **3**

The Pivotal Encounter 3

Stranger Fetishism and the Circulation of Emotions 4

Flesh and Intercorporeality 7

References **12**

Introduction

"Man has to perform an act of incarnation, for he is dis-embodied (désincarné) by his imagination. What comes to us from Satan is our imagination" (Weil, 2002, p. 54). This intuition by French philosopher and political activist Simone Weil captures the core of this thesis and the underlying motives for the production of *Hitodama* - A soft robot for mediated incarnation. My guiding principle is, and has always been since I was discharged from my military duty, the use of cutting edge technology for social well-being. Throughout my evolution as a developer, I slowly drifted away from paths of algorithmic rationality and abstract, alienated coding and into questions of meaning and existence. Following my Bachelor's degree in Philosophy of mind and Neurobiology, I have sought ways to transcend my institutionalized role of a programmer and apply the knowledge I have gained to challenge pressing issues of our society, and in particular, my own society in Israel.

The final phase transition occurred in the summer of 2012, when I landed on an opportunity to join a two-week conflict resolution workshop in Germany. The initiative, as started by an Israeli and a Palestinian who formed a relationship through mutual work, grouped young adults from both sides, carrying their hopes and doubts, to sit and talk together in one shared space. The participants in fact lived no more than a hundred kilometers away from each other; and yet they were so infinitely apart in practical terms that the most reasonable place for them to meet was in a separate continent, 4000 kilometers away. Ever since its formation, Israel has been divided between two nations, Jews and Palestinians. Due to the events of the 1967 "six day war", and until this very day, most of the Palestinians reside under Israeli military occupation. Access restrictions enforced by the Israeli government prohibit the crossing of populations between the nations and inhibit the Palestinians' mobility. A 700-kilometer-long concrete barrier surrounds the "Green line" that separates Israel from the West Bank – the area that currently holds the largest population of Palestinians within the former mandatory Palestine that lies between the Mediterranean sea and the Jordan river. While the crossing of Israelis to the other side is, at best, frowned upon, and at worst institutionalized and encouraged in the case of settlements; the Palestinians endure stricter restrictions, not only across the West Bank, but also within it. Multiple checkpoints divide different areas of the land and force the Palestinians to face military control on a daily basis. These restrictions compelled the Palestinians in our group to take a detour through Jordan in order to get to Germany, rather than taking the shortest path through Israel's airport.

Since the conflict between the nations is very much situated in the land of Israel/Palestine, meeting at a relatively neutral and distant location was also constructive. As noted by Nietzsche (2001, p. 134) : "Egoism is the perspectival law of feeling according to which what is closest appears large and heavy, while in the distance everything decreases in size and weight" . Albeit Germany plays significant role in the conflict with its great effect on the historical processes that lead to the formation of Israel as the home of the Jewish people, it was,

nevertheless, easier for the parties to bridge the gaps without the unnerving presence of soldiers and the affect of this blood-soaked land. Up until then, the closest encounter I have had with a Palestinian was an occasional crossing with a nearby "Israeli-Arab". This controversial term can be accounted for an attempt to sequester the national aspirations of the Palestinians that ended up under Israeli jurisdiction during the 1948 war for its independence (Peleg & Waxman, 2011, p. 26). To this day, the 1948 war marks both a national holiday for Israelis and a monumental catastrophe, or "al-Nakbah", for Palestinians, due to hundreds of thousands of them being driven out from their homes and becoming refugees in the neighboring countries. As for 1967 Palestinians that found themselves out of Israel's borders after its formation – they are currently living under either siege in Gaza or under military occupation in the West Bank. Naturally, my encounter with them has been strictly imaginative or digital – this was about to be my first physical encounter with the *Other*.

Growing up as part of a middle-class Israeli family, in Tel-Aviv of the 90s, I was raised upon liberal and humanistic values, all while living in the occasional war zone of missiles and suicide bombings. I was constantly immersed in media spectacles, interchanging from the hopeful discourse of peace, to the despondence of carnage of war. As a result, I developed a self-contradictory and somewhat post traumatic view of the Palestinians: They represented, on one hand, a source of danger, and on the other, a marginalized and abused population. Their behavior was both condemned and justified, they were both terrorists and freedom fighters; they were to be reconciled with, but could not be fully trusted.

Chapter 1: The Phenomenology of Incarnation

The Pivotal Encounter

I remember the anticipation I felt as we arrived, in pouring rain, to our host institution "Jugendakademie Walberberg", a youth center and hostel in a remote village close to Cologne. The Palestinians were already waiting for us at the rendezvous point, waving their national flags, demonstrating unity. Upon meeting the embodied strangers face to face, I experienced what could be described not only as an emotional turmoil, but also to some extent a spiritual event. A vertical motion in which transcendental forces and ideas sedimented within a body, only so that they can once more coil up within themselves, and transcend along their historical contingency to emerge a true found *Logos* – the voice and ideas of the strangers in their corporeality. The *Other* was no longer a fetishized stranger, but a verified existence - Weil's intuition of incarnation was validated. After this event, I felt grounded, more open to difficult discussions and was able to obtain a sense of pain relief. It was as if the corporeal presence of the Palestinian in front of me had untangled and mended short-circuits that existed in my mind, and from then on, everything felt more natural.

At the end of the workshop in Germany, we were asked to think on how we

can utilize what we had gained toward the upcoming future. At that moment, I felt a great sense of duty – I was to use my software engineering skills to bring about this event that I experienced to a massive scale, to enable conflict resolution for the masses until a critical point of the nonlinear system that is society is reached, and the democratic process is shifted toward peace-making. I did not consider at first that corporeality as such, is a crucial ingredient for this process. I simply aimed toward a free and expressive virtual encounter between conflicted strangers; whether through games, music, chatting or other forms of online communication. Now, however, I would like to contend that the virtual reality is insufficient for a true determination of history, and for a true transformation of the individual. Through the Merleau-Ponty's phenomenology and post-colonial theories of Sarah Ahmed, I would argue that an embodiment is necessary for inter-subjective dialectics that determine the style of our social existence. The physical flesh of our subjectivity in time and space, and our physical interaction with the other, demarcates our being in this world and form our social identity. This realization led me to pursue the technological solution for an efficient, mobile and expressive *re-embodiment*, a *techno-flesh*; one that can cross borders, separation barriers and facilitate events of incarnation when a physical encounter is not possible. I found the answer in the form of Soft Robotic Telepresence, a modern-day incarnation, an Avatar for pain relief.

In this thesis, I establish a theorem regarding the importance of embodiment in social transformation; I then ask the question of whether a remote re-embodiment, a *techno-flesh*, can exhibit the same power for social dialectics as a direct encounter, and if not, how can we bring it as close as possible to the actual thing. I will outline my journey for constructing a telepresent soft robot that can serve as a mediator between subjects in conflict, knowing that I will first and foremost test it in the land of Israel and Palestine, but hoping that it can be applicable to any situation of conflict or other situations of social and physical gaps. The implementation is put to preliminary testing and is evaluated for future work. I invite the reader to join me on this journey of transcendent hope and corporeal suffering.

Stranger Fetishism and the Circulation of Emotions

We begin with a further investigation of the conditions that led to the above event of incarnation. As noted, prior to the encounter, I had nothing but an image of a Palestinian; the so called *Other*. An image that was fed by media, by conversations, by my own internal processes, none of which originated directly by a Palestinian, co-inhabiting my own time and space. I have developed a milieu of emotions toward this image that were by definition generalized and prejudiced, since they were oriented toward an abstract entity, a generalized identity. Moreover, these emotions tended to be posited on more extreme ends of the emotional spectrum, either being strongly negative or strongly positive.

This phenomenon is symptomatic to what is described by Sara Ahmed as "Stranger Fetishism". In her book *Strange encounters* she defines it as "a fetishism of figures: it invests the figure of the stranger with a life of its own in-

sofar as it cuts 'the stranger' off from the histories of its determination." (Ahmed, 2000, p. 5). The epistemological gap of the stranger in its corporeality leaves an opening for an over-representation; a figure of our imagination that we endow with deep emotional value. Ahmed borrows the term "fetishism", both from a Marxist perspective of "commodity fetishism" and from a Freudian perspective of a phantasmic substitution.

Let us first examine the Marxist perspective. In *Capital: Vol I*, Marx explains his notion of commodity fetishism (Marx, 2015, p. 47). The fetishism lies in the Bourgeois's inability to discriminate between the commodity item's inherent and physical history - such as labor time, materiality and use, and its abstract value that is determined by the social relations of exchange: "A commodity is therefore a mysterious thing, simply because in it the social character of men's labour appears to them as an objective character stamped upon the product of that labour" (Marx, 2015, p. 47). When we assign a monetary value to a certain item, we in fact conceal the fact that this value is a result of a social and historical process, and it appears as if the value is an objective property of that item. Ahmed equates this process to the fetishization of the figure of the stranger. So in this case, the 'commodity object' that is tied to a material basis would be a corporeal person of some social identity, while the value that we assign to it is the abstract figure of the stranger. Much in the same way, we are prone to assign our prejudices, that are a product of social exchange, as actual qualities of a person.

The Marxist analogy becomes even more interesting when we examine the economical circulation of emotions that are associated with the stranger. In her later book, *Cultural Politics of Emotion*, Ahmed identifies a relation between the circulation of abstract monetary value during commerce and the circulation of affect involving strangers in society (Ahmed, 2014, p. 45). In his discussion about the general formula of capital (Marx, 2015, p. 104), Marx explains the importance of the transition from the more simple form of trade: Commodity-Money-Commodity (C-M-C), to the more modern form of Money-Commodity-Money (M-C-M). In the former, more simple form, money is used only as an abstract mediator between two objects that are grounded in their materiality and use-value. For example one would sell their produced crop of corn to obtain money, which would then be used to buy cloths. However, in the latter form of M-C-M, the accumulation of abstract value is the end goal of the transaction, and since the only use of the money is to further accrue it, the process is endless. Thus, value, or circulated capital "suddenly presents itself as an independent substance, endowed with a motion of its own, passing through a life-substance of its own, in which money and commodities are mere forms forms which it assumes and casts off in turn" (Marx, 2015, p. 107). The same effect, Ahmed suggests, occurs when the imaginative figure of the stranger, and its associated emotions are circulated throughout society. Ahmed provides as an example the discourse surrounding asylum seekers in the UK. Leaders of the conservative party have created a frightening image of the asylum seeker, one that is not only "flooding" and "swamping" the nation, but is also disingenuous in their intention; faking the need for asylum in order to be able to reside in the country.

This discourse is passed around, from speech to speech, from media report to office conversations, all while breathing life into the imaginative figure and accumulating affect, intensifying the associated negative emotions. The reason for this intensification is exactly that which enables the accumulation of capital; its disassociation with anything physical that can set its bounds. According to Ahmed "The impossibility of reducing hate to a particular body allows hate to circulate in an economic sense, working to differentiate some others from other others, a differentiation that is never 'over', as it awaits others who have not yet arrived. Such a discourse of 'waiting for the bogus' is what justifies the repetition of violence against the bodies of others in the name of protecting the nation" (Ahmed, 2014, p. 47). She notes that her analogy to Marx is limited, since her "argument does not respect the important Marxian distinction between use value and exchange value" (Ahmed, 2014, p. 45)", yet it is imperative to recognize the metaphysical similarity between the two notions of circulation. In both, a lack of access to the worldly *flesh* of things, whether they are a stranger or a commodity, drives the emergence of an abstract image. The circulation of the image in society only intensifies its perceived reality, and the powers the projection of strong emotions toward that image.Once an individual of the targeted group, let us say a Muslim asylum seeker, is encountered, whether through media or in person, an event occurs which Ahmed refers to as"the 'sticking' of signs to bodies" (Ahmed, 2014, p. 13). The accumulated imaginary value that was intensified by circulation *sticks* to the body of the stranger and appears as if it is an inherent quality of that body.

The discussion on projection and stickiness leads us to the Freudian view of fetishism. Ahmed suggests that the "process of fetishisation involves, not only the displacement of social relations onto an object, but the transformation of fantasies into figures" (Ahmed, 2000, p. 5), she slightly backtracks in the corresponding footnote (Ahmed, 2000, p. 182), arguing that the Freudian model is less suitable, since it privileges the phallus (or lack thereof in women), as that which is being concealed and substituted by the fetishized object. It is however important to note that in Freud's account for fetishism, it is described as "habitually present in normal love, especially in those stages of it in which the normal sexual aim seems unattainable or its fulfilment prevented" (Freud, 1953, p. 154). Once more is the tendency to ascribe emotional value to an object, as a substitution for a physical state that is non-accessible. We can observe a similar notion at the other end of the emotional spectrum when dealing with the "uncanny". The term was first explored psychologically by Ernst Jentsch (1997), defined as an uneasy feeling of "psychical uncertainty" (Jentsch, 1997, p. 5) that arises when something unknown and foreign is encountered in correlation to something old and familiar, for example when we are uncertain if a certain character is a human person or an automaton. Freud expanded on that notion, claiming that the "uncanny is in reality nothing new or alien, but something which is familiar and old-established in the mind and which has become alienated from it only through the process of repression", citing examples of repressed phenomena such as "animism, magic and sorcery, the omnipotence of thoughts, man's attitude to death, involuntary repetition and the castration complex"

(Freud, 1955, pp. 241–242). Nevertheless, there is a resemblance between the uncanny and fetishism. In both cases, a certain inaccessibility to the true nature of an object, a certain gap, serves as an incubator for repressed desires or fears toward that object. The conviction that positive and negative emotions are in many occasions interchangeable is also supported by Ahmed (2014, p. 50). She defines hate as a form of intimacy that is in fact predicated by love, citing Gordon W. Allport's classic account *The Nature of Prejudice*: "a symbiosis and a loving relation always precede hate. There can, in fact, be no hatred until there has been long-continued frustration and disappointment" (Allport, 1954, p. 215). This is all the more supported by neuropsychological studies such as one performed by Zeki and Romaya (2008), showing that hate and love share overlapping neuropsychological mechanisms.

Whether it is fear, love, hate or any other emotion, the impossibility of truly knowing a subject may lead to figure abstraction and ultimately to fetishisation: an emotionally attached relation between us and an imaginative figure. Such a relation, as any highly emotional attachment, is prone to addiction and obsessiveness. Moreover, as we've seen, the figure can gain a life of its own and intensify once it takes part in social circulation. Surly, this effect is not simply triggered on any subject that is only partially known; it requires a starting point, an initial value, a birth of a figure. It could be a reported incident involving an asylum seeker, or a mysterious encounter with an attractive individual. If out relation to the abstract figure would remain in the transcendent realm, it wouldn't have been a major cause for concern, but the relation is naturally cast back into a living subject, resulting in peculiar behavior at best and violence at worst. It remains to be asked, how does one "truly" know a subject? How do we "unfetishise" the stranger? As Marx's example suggests, there may exist a pivotal role to physicality, to corporeality. Thinking about today's virtual and digital methods of social interaction, how does a typical WhatsApp conversation contribute to social relations? It is well agreed upon (TODO: **REF**), that indications of the users' status such as "typing" or "seen message", create mystery and thus only incubate the fetishized figure, not to mention more enigmatic ways of knowing individuals such as through their social feeds. Yet it seems that even a direct Skype conversation is somewhat lacking (TODO: REF?). The exact cause is elusive, and perhaps only manifests unconsciously, but a virtual encounter always leaves some room for interpretations regarding individuals and our relation to them. Is it body language that we are missing? Some nuance of speech that is not transmitted accurately over the fiber optic cables? Or is it something even more fundamental? To illuminate the significance of the intercorporeal interaction, we turn to the phenomenology of Maurice Merleau-Ponty.

Flesh and Intercorporeality

How is the physical different from the virtual? How is the real different from the imaginary? These kind of questions quickly evolve into the most fundamental questions of *being* and Consciousness. Queries that have troubled man-kind in

both east and west since the beginning of history. However, we are not simply looking for any perspective on the meaning of life and existence; we are looking for one that bestows special status to the physicality and embodiment of the human connection. One that investigates into the corporeality of the *Other* as a medium and a foundation of affect and knowledge, that incorporates the *Other* into *Being*. There is no better place to look than the phenomenology of Maurice Merleau-Ponty.

Phenomenology is a discipline of philosophy that is firstly attributed to Edmund Husserl, but spans a wide range of thinkers and methods (Smith, 2018). Husserl defines it as a "science of essence", pertaining to the a priori intuitions of consciousness and experience (Husserl, 1982, p. XXII). The discipline of phenomenology can be seen as a historical development which stems from the intuitions of the greatest thinkers of western philosophy such as Descartes and Kant; the intuition that if we are to know anything about the world, it has to start with our conscious experience and its intuitive structures. Merleau-Ponty joins this project with his most widely acclaimed work *Phenomenology of Perception* (Merleau-Ponty, 2013). In this work he reminds us that any pure conscious experience is nevertheless an act of the body, that perception is a bi-directional interaction of our body with the world, inhabiting time and space. This implies that "learning", and even "thinking" are all intentional bodily actions upon the world, and should be investigated as such. According to Merleau-Ponty, insofar as we develop as a body, the range of possibilities is gradually "sedimented" into our physiology, and we become habituated, adjusted to the world that surrounds us. This is not a solipsistic act, since we always co-develop our social identity in concordance with other inhabitants of the world. Despite being written in the 1940s, this approach is relevant today even in regards to modern neuroscience, especially to researchers that inspect the brain as a self-organized non-linear dynamic system that dissipates into the open environment. One of those researches was Walter J. Freeman, a scientist of *Neurodynamics*. In his book *How Brains Make Up their Mind*, Freeman argued that the brain operates as a self-organized complex system of nerve cells, that is arranging its "attractor landscape" in concordance with the outside world. Input from the outside environment triggers this dynamic system into a trajectory of patterns that determines our behavior. Freeman cites Merleau-Ponty numerous times, asserting his intuition of bodily perception and assimilation of the world's structures. (Freeman, 2000, pp. 125–127). An even more radical scientific manifestation of Merleau-Ponty's theories can be found in theories of *Quantum Neurodynamics*, that portray the brain as a dissipative quantum field that melds with the external world. Quantum neuroscience researcher Giuseppe Vitiello refers to the "openness of the brain to the external world" as dissipation (Vitiello, 2007); Merleau-Ponty uses very similar phrasings in his theories, maintaining his focus on the entire body, rather than just the brain. Such thought is linked to even more modern theories, for example regarding the roles that gut microbes play in shaping our behavior (Dinan, Stilling, Stanton, & Cryan, 2015). The intuitive investigations of Merleau-Ponty are proven to be scientifically sound even decades after they were written. (TODO: Write about

Enactivism).

In final published works of Merleau-Ponty: *The visible and the Invisible* (1968), a work that is incomplete due to his untimely death at the age of 53 and was published posthumously, and *Eye and Mind* (1964, p. 159), an essay about aesthetics and metaphysics, Merleau-Ponty starts laying down his own ontology - the ontology of *flesh*. He critiques previous ontological interrogations of existence and begins to divulges his own theory, placing a great emphasis on how our relationship with the *Other* is crucial to our understanding of metaphysics; after-all, it is the basis for our existence as social beings. The underlying question, however, is still one of *knowing*. What exists? What is true? How do we make the logical leap from being immersed in a vivid experience of life, to devising positive facts about our world, ourselves and others? Merleau is critical of "philosophies of reflection", primarily referring to those of Descartes and Kant that could be considered as forms of Idealism. The proverbial *Cogito* - "I think there for I am", intuitively shifts our attention to the world of *thought*. We cannot directly know and access the world outside of our body, except through the mediator of thought. Through reflection and logical analysis, we deduce whether our experience is that of perceiving the real outside world, or that of imagining. By examining the consistency of change in our inner world, in relation to our actions and our body, we assert the geometrical rules of the world. Our interaction with the world is passive; we consume light that is coming from things, and organize it according to our logical structures. What does that suggest regarding our relation to others? "If then the others are thoughts, as such they are not behind their body which I see — they are, like myself, nowhere; they are, like myself, coextensive with being, and there is no problem of incarnation". Reflection is thus "the simple transposition of the incarnate subject into a transcendental subject and of the reality of the world into an ideality" (Merleau-Ponty et al., 1968, p. 31). Hence, intuitively we disregard the others in their physicality: "there is no intermundane space, there is only a signification 'world' " (Merleau-Ponty et al., 1968, p. 53). In *Eye and Mind* Merleau-Ponty argues that painting is the ultimate manifestation of *Being* in all its depth. A Cartesian view of vision however, is insufficient in its understanding of the world around us: "A Cartesian does not see himself in the mirror; he sees a dummy, an 'outside,' which, he has every reason to believe, other people see in the very same way but which, no more for himself than for others, is not a body in the flesh." (1964, p. 170). From these writings it is clear that this form of idealism is perilous, because it encourages the reduction of individuals to thoughts, of actions to signs and of bodies to images. Such a view may lead Sarah Ahmed's notion of fetishisation of the *Other*.

Idealism has another fundamental flaw in its logic, and that is its circularity - the fact that the rules of perception and the relation between subject and object, are defined using the same logical constructs that they induce. How could we formulate the relation between ideas and things, when all we have is our pure experience that has no inherent logic of subject and object? What is the primal a priori basis for the notion of space? Who is the circumscribed "I" that thinks therefore it exists? These logical loops sprouted other philosophies of experience,

such as *Being and Nothingness*, the title of Jean Paul Sartre's essay on ontology (Sartre, 2012). Sartre recognizes that our subjective experience is in fact all there is, this *Being* that we endure encompasses everything and leaves no room for a subject or object. What then remains to our subjectivity is merely a vessel for *Being* - a *Nothing*, a negation of everything. We are solely a "a fissure that deepens in the exact measure that it is filled" (Merleau-Ponty et al., 1968, p. 53). Sartre states that "man is the being through whom nothingness comes to the world" (Sartre, 2012, p. 24), referring in fact to our freedom of choice. The ability of the human consciousness to create a distance from the totality of *Being*, to "secrete a nothingness which isolates it" (Sartre, 2012, p. 24) and to act for itself, is Sartre's idea of freedom. Nevertheless, Merleau-Ponty reminds us that our concrete body, our thoughts, our subjectiveness, those are all still parts of a *Being* that lies at a close distance to the nullified self. Where, then, is the place of the *Other* in such *Being*? It is clear that if *Being* is everything, then my body and situation share the same *Being* as the *Other*'s body and situation, an intermundane space is emerging. But more than a cooperation, the interaction with the *Other* is a vortex that drains into my nothingness: "The experience of the other's gaze upon me only prolongs my inward conviction of being nothing, of living only as a parasite on the world, of inhabiting a body and situation". (Merleau-Ponty et al., 1968, p. 62). The *Other* is there, reaching me, touching me, but I cannot reach its essence, it is transcendent. For me, there is only one nothingness and that is my own, my own freedom. I can only view the *Other* as a superficial clone of myself. This type of analysis, Merleau-Ponty states, "makes of the other an anonymous, faceless obsession, an other in general" (Merleau-Ponty et al., 1968, p. 72). As explained by Jack Reynolds (2014, p. 134), Sartre is accused of ignoring "the way in which otherness is always intertwined with subjectivity". This inscrutable gap between the *Other*'s will and the flesh of the world pushes us once again into the chasm of fetishism. In one of the footnotes in *The Visible and the Invisible* (Merleau-Ponty et al., 1968, p. 81), Merleau-Ponty notes a more general problem in what he names "philosophies of the negative", such as the one posed by Sartre: they tend to refer to to the problem of *the* other and not *an* other; "a non-I in general". This generality is exactly the type of abstraction that Sarah Ahmed is problematizing in her work. The connecting thread between *Stranger Fetishism* and the philosophical critique of Merleau-Ponty is our ability to view the *Other* as a subjectivity in the flesh, as a body whose consciousness is interconnected to our body, perhaps only then we can truly respect the other's alterity, inspect its nuances and perceive our interactions without prejudice. Merleau-Ponty defines this as *intercorporeality"*.

The final chapter in *The Visible and the Invisible*, titled *The Intertwining-The Chiasm*, is Merleau-Ponty's last and only attempt to devise a positive ontology of the world, the ontology of *flesh*. Albeit the thoughts end abruptly, this chapter and its surrounding notes and essays lay a foundation to a vast array of contemporary philosophy. Ironically, as a prerequisite to the ontology Merleau-Ponty asks us to give away our primal need for absolute logical truth, for a *thesis*. To retreat the Bird's eye view of idealized logic, to live in the moment. Any attempt for logical truth would be sucked into an enveloping *Being*, leaving

only a void *Nothingness* at the core. Instead, he proposes a dialectic that is an endless interrogation, void of significations "We are not asking ourselves if the world exists; we are asking what it is for it to exist" (Merleau-Ponty et al., 1968, p. 96). It is futile to try and freeze the notion of *Being*, because we are an inseparable part of it. The world that we are trying to resolve is perceived only by us, a body that is part of that world. "The effective, present, ultimate and primary being...offer themselves therefore only to someone who wishes not to have them but to see them, not to hold them as with forceps, or to immobilize them as under the objective of a microscope, but to let them be and to witness their continued being" (1968, p. 101).

Our recognition of the world stems from the fact that we are of it, the seer is also visible. Our body perceives under the same rules that the universe operates, all made of the same *flesh*. Of course, we maintain our *invisible* state, our private experience of colors, sounds and feelings, but that experience is directly attached to the same flesh, and is a direct result of our body's openness to the world. Then, every action we take or idea we conceive is a physical response of our body to the world. The conception of an idea is nothing but "coiling up or redoubling" (1968, p. 114) of the bodily experience. It is out body sensing, then modifying itself, learning something new, only to once again open up and interact with the physical world, whether it is by speaking out or any other act. This is a somewhat of a general abstraction to John Dewey's "Learning by Doing" (1923): According to the theory of *flesh*, even reading a book would be an active physical movement upon the world in which our eyes touch the pages of the book as we sense reactive force with our entire body: "between my body looked at and my body looking, my body touched and my body touching, there is overlapping or encroachment, so that we must say that the things pass into us as well we into the things" (Merleau-Ponty et al., 1968, p. 123). Could an increased exertion of the body lead to an increased capacity of learning? A 2012 study by the Finnish national board of education reviewed the recent research on the subject and concluded that this is indeed the case, noting that "motor and cognitive skills would appear to develop hand in hand, because the same mechanisms of the central nervous system are responsible for controlling both motor and cognitive skills in parallel" (Syväoja et al., 2012). We are interested, however, not only in the learning and assimilation of simple facts such as Newton's law of mechanics, but also in the internalization of social meanings such as the image of the stranger or the acquisition of new behavioral patterns in society.

For Merleau-Ponty, our interaction with another human being is what validates our existence in this world, in the *flesh*. It provides us the recognition that we are visible as much as we are seeing. This recognition is based, according to Merleau-Ponty on a primordial intuition that we all all of the same *flesh* in the same universe, that our actions are undeniably seen by another as much they are seen by us. He makes the bold statement that the subjective experience of another is not completely hidden from us, because it is physically manifested in our shared space: "it suffices that I look at a landscape, that I speak of it with someone. Then, through the concordant operation of his body and my own,

what I see passes into him, this individual green of the meadow under my eyes invades his vision without quitting my own, I recognize in my green his green" (Merleau-Ponty et al., 1968, p. 142). This recognition opens before us the entire universe of intersubjective being, since by transitivity we are all seen and touched by one another: "What is open to us, therefore, with the reversibility of the visible and the tangible, is— if not yet the incorporeal— at least an intercorporeal being, a presumptive domain of the visible and the tangible, which extends further than the things I touch and see at present." (Merleau-Ponty et al., 1968, p. 143). This conviction could be interpreted in a weaker or a stronger sense. In the weaker sense, it lays the foundation to social aspects of contemporary cognitive science disciplines such as enactivism and embodied cognition, as well as philosophical concepts as Performativity. Research in those fields asserts that we define and express our social identity through bodily interactions with others - Through acting, reenacting and resonating to the physical actions of others. For example, the phenomenon of *mirror neurons*, although much more complex than the popularized interpretation of its name, is still being researched today and exemplifying models of how the perception of bodily actions by another resonates within the correlating areas of our own motor cortex (Craighero, 2014). Another notable example comes from a phenomenon known as social rhythmic entrainment - It describes how people bond through synchronized movements, whether they are dancing together to the rhythm of music or or even walking at the same pace (Stupacher, Wood, & Witte, 2017). In the stronger sense, however, intercorporeality is not only our social, epistemic backbone, but our metaphysical one as well. It is constitutive to our sense of existence and our faculty of perceiving reality. This notion might explain why losing our social meaning may feel like a violation of our own existence.

References

Ahmed, S. (2000). *Strange encounters : Embodied others in post-coloniality*. London: Routledge. Retrieved from https://aalto.finna.fi/Record/alli.752377

Ahmed, S. (2014). *The Cultural Politics of Emotion* (NED - New edition, 2.). Edinburgh University Press. Retrieved from http://www.jstor.org/stable/10.3366/j.ctt1g09x4q

Allport, G. W. (1954). *The nature of prejudice.* Oxford, England: Addison-Wesley.

Craighero, L. (2014). The role of the motor system in cognitive functions. In *The Routledge Handbook of Embodied Cognition* (pp. 69–76). Routledge.

Dewey, J. (1923). *Democracy and education: An introduction to the philosophy of education*. Macmillan.

Dinan, T. G., Stilling, R. M., Stanton, C., & Cryan, J. F. (2015). Collective unconscious: How gut microbes shape human behavior. *Journal of Psychiatric Research*, *63*, 1–9. doi:10.1016/j.jpsychires.2015.02.021

Freeman, W. J. (2000). *How brains make up their minds*. Columbia University Press.

Freud, S. (1953). *The standard edition of the complete psychological works of Sigmund Freud.* (Vols. VII (1901-1905)). London: The Hogarth Press : The Institute of Psycho-Analysis.

Freud, S. (1955). *The standard edition of the complete psychological works of Sigmund Freud.* (Vols. XVII (1917-1919)). London: The Hogarth Press : The Institute of Psycho-Analysis.

Husserl, E. (1982). *General introduction to a pure phenomenology.* The Hague; Boston; Hingham, MA, USA: M. Nijhoff ; Distributors for the U.S.; Canada, Kluwer Boston.

Jentsch, E. (1997). On the psychology of the uncanny (1906). *Angelaki: Journal of the Theoretical Humanities*, *2*(1), 7–16.

Marx, K. H. (2015). *Capital: A Critique of Political Economy* (Vol. 1). Moscow, USSR: Progress Publishers. Retrieved from https://www.marxists.org/archive/marx/works/download/pdf/Capital-Volume-I.pdf

Merleau-Ponty, M. (1964). *The primacy of perception: And other essays on phenomenological psychology, the philosophy of art, history, and politics.* Northwestern University Press.

Merleau-Ponty, M. (2013). *Phenomenology of perception.* Routledge.

Merleau-Ponty, M., Lefort, C., & Lingis, A. (1968). *The visible and the invisible : Followed by working notes.* Evanston: Northwestern University Press. Retrieved from https://aalto.finna.fi/Record/alli.761571

Nietzsche, F. W., Williams, B. A. O., Nauckhoff, J., & Del Caro, A. (2001). *The gay science : With a prelude in German rhymes and an appendix of songs.* New York: Vintage.

Peleg, I., & Waxman, D. (2011). *Israel's Palestinians: The Conflict Within.* Cambridge: Cambridge University Press. doi:10.1017/CBO9780511852022

Reynolds, J. (2014). *Understanding existentialism.* Routledge.

Sartre, J.-P. (2012). *Being and nothingness.* Open Road Media.

Smith, D. W. (2018). Phenomenology. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Summer 2018.). Metaphysics Research Lab, Stanford University. Retrieved from https://plato.stanford.edu/archives/sum2018/entries/phenomenology/

Stupacher, J., Wood, G., & Witte, M. (2017). Synchrony and sympathy: Social entrainment with music compared to a metronome. *Psychomusicology: Music, Mind, and Brain*, *27*(3), 158–166. doi:10.1037/pmu0000181

Syväoja, H., Kantomaa, M., Laine, K., Jaakkola, T., Pyhältö, K., & Tammelin, T. (2012). Liikunta ja oppiminen. *Tilannekatsaus Lokakuu. Helsinki: Opetushallitus.* Retrieved from https://www.oph.fi/download/145366_Physical_activity_and_learning.pdf

Vitiello, G. (2007). Quantum dissipation and information: A route to consciousness modeling. *NeuroQuantology*, *1*(2).

Weil, S. (2002). *Gravity and Grace.* London: Routledge. Retrieved from http://www.amazon.com/dp/0803298005

Zeki, S., & Romaya, J. P. (2008). Neural correlates of hate. *PloS One*, *3*(10), e3556.