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DOSSIÊ: RESSONÂNCIA E DIAGNÓSTICOS DO TEMPO PRESENTE

The friction of mediation. For a critique of technologically mediated world-relations

A fricção da mediação. Para uma crítica das relações-mundo tecnologicamente mediadas

La fricción de la mediación. Para una crítica de las relaciones-mundo tecnológicamente mediadas

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Abstract: While contemporary technology studies and philosophy have illuminated humanity's constitutive technicity, they often bracket questions of modern social formation and alienation. Conversely, critical theory's modernity diagnoses have tended to treat technology primarily as instrumental reason. This essay programmatically explores the tension between postphenomenology's relational account of technological mediation and Hartmut Rosa's critique of modernity. Introducing friction as constitutive discontinuity in mediated world-relations, it argues that modernity's escalatory dynamics reduce friction to obstacles to be overcome. By foregrounding the friction of mediation, the paper sketches a critique of technologically mediated world-relations oriented toward rehabilitating the engaging and transformative potential of friction.

Keywords: Philosophy of technology. Critical Theory. Hartmut Rosa. Technological mediation. World-relations.

Resumo: Embora estudos contemporâneos e a filosofia da tecnologia tenham esclarecido a tecnicidade constitutiva do humano, muitas vezes deixam de lado questões relacionadas à formação social moderna e à alienação. Por outro lado, diagnósticos teórico-críticos da modernidade tendem a tratar a tecnologia principalmente como razão instrumental. Este ensaio explora programaticamente a tensão entre a abordagem relacional que a pós-fenomenologia adota em relação à mediação tecnológica e a crítica da modernidade de Hartmut Rosa. Introduzindo o conceito de fricção como descontinuidade constitutiva nas relações-mundo tecnicamente mediadas, o ensaio argumenta que a dinâmica escalonante da modernidade reduz fricções a obstáculos a serem superados. Destacando a fricção da mediação, o ensaio esboça uma crítica das relações-mundo tecnologicamente mediadas orientada à reabilitação do potencial vinculante e transformador da fricção.

Palavras-chave: Filosofia da tecnologia. Teoria Crítica. Hartmut Rosa. Mediação tecnológica. Relações-mundo.

Resumen: Aunque los estudios contemporáneos y la filosofía de la tecnología han esclarecido la tecnicidad constitutiva de lo humano, a menudo dejan de lado cuestiones relacionadas con la formación social moderna y la alienación. Por otro lado, los diagnósticos teórico-críticos de la modernidad tienden a tratar la tecnología principalmente como razón instrumental. Este ensayo explora programáticamente la tensión entre el enfoque relacional que la posfenomenología adopta respecto de la mediación tecnológica y la crítica de la modernidad de Hartmut Rosa. Al introducir el concepto de fricción como discontinuidad constitutiva en las relaciones con el mundo mediadas técnicamente, el ensayo sostiene que la dinámica escalatoria de la modernidad reduce las fricciones a obstáculos que deben superarse. Al poner de relieve la fricción de la mediación, el ensayo esboza una crítica de las relaciones con el mundo mediadas tecnológicamente

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orientada a la rehabilitación del potencial vinculante y transformador de la fricción.
Palabras clave: Filosofía de la tecnología. Teoría Crítica. Hartmut Rosa. Mediación tecnológica. Relaciones-mundo.

Introduction

Humans are technological beings. There is nothing "artificial" in our artificiality, and, in recent decades, different branches of the humanities have undertaken a critique of humanism's radical separation between humans and artifacts. Donna Haraway's cyborg (1991), Bruno Latour's actor--networks (2005), Bernard Stiegler's reflection on the constitutive technicity of memory (1998), and Don Ihde's lifeworld technologies (1990) are different versions of the idea that technologies co-constitute (and not simply lie in between or give support to) our senses of self, our forms of acting, of historicity, or our ways of giving meaning to the world.

And yet, at the apex of our history as world--makers, we experience our place in the world and the value of our agency with great ambiguity.

If we adopt the idea that technology, both as artifacts and technical practices, is constitutive of our ways of being, we are led to ask what it means for us to live in a "technological age". Associated initially with (scientific) knowledge on the "mechanical arts" in the 19th century, *technology* has acquired its current meaning, as historian Leo Marx (1997) demonstrated, in the wake of a need for articulating technics with ideas of scientific exactitude, social progress, and refinement. Also, the term came to bear the ambiguity of designating both artifacts and the "breakdown of the boundaries" that separate them from "the rest of society and culture" (Marx 1997, 980). This "ideological" and structural integration of technics into the modern social formation is a topos in social theory from Marx to Weber and the early Frankfurt School. Moreover, Heidegger's (1977, 19ff.), position that modern technology has its own way of "revealing", which "enframes" the world (including humans) as a "standing-reserve", i.e., a stock of raw materials waiting to be consumed has profoundly influenced cultural criticism.

Is there indeed something particular, qualitatively different in our collective and individual relationship with technology in modernity? If so, what would this mean to the attestation that we are constitutively technological beings? In other words, how to critically examine the "danger" (Heidegger, 1977, 26-27) in the techno*logos* that orders our existence without resorting to romantic, pre-technical ideas of humanity? Pursuing such questions leads us into tensions in contemporary scholarship on technology.

On the one hand, a so-called "empirical turn" (Achterhuis 2001) in the philosophy of technology has meant both a growing theoretical disinterest in Technology beyond individual technolog*ies* (Lemmens 2022) and a contempt for the critique of technological alienation (Verbeek 2022). On the other hand, cultural criticism of technology, including Frankfurtian critical theory, has tended to thematize technology in terms of the totalizing and inherently alienating expression of instrumental reason (Delanty and Harris 2021). My contention, therefore, is twofold. Firstly, following Andrew Feenberg's (2002) diagnosis, a critical theory of technology must incorporate recent theoretical advances in technology studies to account for the constitutive relationship between technics and society. Secondly, if the current empirical scholarship on technoscience still intends to address our constitutive technicity in its present predicament and its manifold crises (in the "Anthropocene"), it must engage with the structural relationships between technology and the modern sociocultural formation, and critique its alienating consequences and unrealized potentials.

This essay aims to map this theoretical gap by exploring the tension between the relational account of technological mediation in Postphenomenology and Hartmut Rosa's critique of modernity, which develops a relational-normative critical model – namely, a critique of world-relations. Choosing this site to explore this tension is theoretically fruitful because both Postphenomenology and Rosa's critique begin with a relational ontology to which subject-object distinctions are

not preconditions, but rather results of world-relations. Yet they differ fundamentally in how they account for the historical and normative shaping of technologically mediated world-relations. Rather than offering a fully developed synthesis of these frameworks, this essay is programmatic and proposes an exploratory approach by introducing the concept of *friction*. Foregrounding friction as constitutive discontinuities in technological mediation, it argues that modernity's escalatory dynamics favour a reduction of friction to mere obstacles to be overcome, which generates further disruption and hinders its perception as points of engagement, concern, and adaptive transformation.

On the friction of mediation

In the fictional biography of Cicero, *Imperium*, Robert Harris (2010) makes Tiro – the household slave and later personal secretary of the Roman orator – the narrator. Using the same shorthand he once employed to record Cicero's speeches, Tiro recounts his relationship with his master: "He dictated to me from his bath and his couch, from inside swaying carriages and on country walks. He never ran short of words and I never ran short of symbols to catch and hold them for ever as they flew through the air" (Harris 2010, 14). His writing technique and the wax tablet he carries to capture these flying words are constitutive of the story.

Through Cicero, Tiro, and Tiro's technique, Harris implicitly revives an ancient philosophical concern about technology's place in human life. Stiegler (1998, 3) has argued that "technical" was early associated with sophistic manipulation. Technology is said to be further devalued through its association with labor, women, and slaves (Vallor 2022, 2; Sennett 2008, 5-6) and thus relegated to the "body" side of the Western soul-body divide. *Imperium* aligns with this legacy: Cicero appears as the creative spirit of living speech, while Tiro, the slave, fixes those words in material form and sustains his master's genius.

From an instrumentalist perspective, Tiro's shorthand technique and his wax tablet and stylus are cunning interventions in the creative process. However, the content of thought, information, words, and ideas remains intact. Humanities' approaches to technology have systematically criticized the instrumentalist view. Social constructivist analyses (e.g., Pinch and Bijker 1984) have exposed the value-laden nature of technical artifacts and emphasized their non-linear evolution. Of greater importance to my argument, however, is the critique of instrumentalism that emphasizes the non-neutrality of the technical in how we experience and act in the world.

The most influential critique of instrumentalism in this regard is found in Heidegger (1977). Instead of being a means to human activity, what is essential in technology is that it "reveals" the world in a certain way; it is a form of production (*poiesis*) that unfolds Being, and not simply a human "making". However, this form of revealing is eminently practical; it concerns the disclosure of the world in our dealings with it (see also Heidegger 1962, 62-72). Within the phenomenological tradition, recent developments in Postphenomenology extend Heidegger's relationality by not only posing technology as a mode of revealing, but also by emphasizing the role of technical artifacts in mediating human forms of being-in--the-world. Very succinctly, starting with the work of Don Ihde (1990), Postphenomenology departs from what it sees as classic phenomenology's account of (modern) technology as a disruption in human-world relations. Ihde's (1990) classic example is Husserl's opposition between the abstract mathematization of technoscience and the "immediate" lifeworld experience. In opposition, Postphenomenology analyses how, in concrete practice contexts, technical artifacts constitutively shape the lifeworld experience, its perceptual texture, and meaning. Technological mediation is, in this sense, a "*source* of the specific shape that human subjectivity and the objectivity of the world can take" (Rosenberger and Verbeek 2015, 12, emphasis in the original).

Postphenomenology exemplifies a broader theoretical turn to the constitutive relatedness of humans and technology. However, this turn also exemplifies an emphasis on continuities, to the

detriment of critical *discontinuities* in technological world-disclosing.

When taking note of what Cicero says, Tiro is not simply fixing on a durable medium what would otherwise be dissipated in the air, but disclosing a form of being in the world. Furthermore, the artifactual dimension of writing – the tablet, the stylus, and the alphabet – mediates the shape of Tiro's subjectivity and the world he encounters. In academia, we could say, we actually write to think. Nevertheless, this disclosed world of writing is not simply available through mediation. It is rather the result of a processual engagement with learning and the "appropriation" of the medium involved in the praxis of writing. This processuality indicates the adaptive and transformative character of technical becoming and hints at what I am trying to conceive as friction.

In an embodied and praxiological sense, friction captures the imperfection of our world-relations, and their care and investment-requiring points of vulnerability. Technological mediation rearranges rather than eliminates friction. From a theoretical perspective, focusing on the friction of mediation means foregrounding discontinuities *in relatedness* rather than separation. A friction--focused account of technological mediation does not oppose relationality but rather adds depth to it. In writing, driving, playing, building, assembling, or simply walking (in shoes), we engage in practices that are technologically mediated but are not integrated into our experience as a smooth continuum. Most of the time, their inherent friction, i.e., their constitutive discontinuities, are backgrounded by our familiarity, our practical absorption in skillfully coping with the world (in Dreyfus's sense[2]). The discontinuities between a human and an aircraft (e.g., the body's senses and the flying motion) become increasingly hidden from experience through training, embodied knowledge, familiarization – in short, through becoming a pilot. But they never disappear and can always resurface in experience (e.g., through a malfunction). The friction of mediation encompasses, therefore, both the constitutive vulnerability of mediated relations and the way this vulnerability is modulated (never eliminated) in our experience through praxis.

Both the excess and the absence of friction can be alienating: the former produces overload and conflict, and the latter a lack of depth or traction in relationships. Problematic, however, is the reduction of friction to an obstacle to be overcome, a "bug" to be fixed. Prevailing patterns of technological development, particularly in the context of digital technology, seem to favor precisely this interpretation of friction, which has been noted and examined in both academia (e.g., Åkerman 1993; Kemper 2024) and public discourse (e.g., discussions on "frictionless" design in Roose 2018 and Snyder 2025) in recent years. Rosa's diagnosis of social acceleration provides a systematic account of how this pattern can be traced to the structural dynamics of modern society. Similarly, his critique of modern world-relations can offer insights into how to rehabilitate friction as a necessary and potentially transformative dimension of technological mediation.

Structural and cultural framing of friction

Hartmut Rosa's *Zeitdiagnosis* has been quite literally a diagnosis of the times, but what is decisive in his approach to modernity is not so much an account of social conceptions of time but of social dynamics, the collective and individual experience of movement, and the latter's relation to our forms of living and giving meaning to our lives. At the same time, instead of a sovereign subject, capable of fulfilling the "unfinished project" of modernity (Habermas 1997) as a project of autonomy, his critique has concentrated on rescuing our capacity to establish responsive, vivid world-relations. Dynamics and relations, forms of movement, and the modes of relationship they enable or hinder lie at the core of Rosa's work. As a consequence, his diagnosis also involves a systematic, but indirect, comment

[2] For an overview of Hubert Dreyfus's development of the concept "skillful coping", see Dreyfus and Wrathall (2014).

on our engagement with friction.

If modern society, as Rosa (2013) has proposed, is structurally and culturally driven by acceleration and growth, and can only stabilize dynamically (Rosa, 2015), then the modulation and management of friction is both a necessity and a central object of concern in its form of reproduction. At this point, however, we must leave the phenomenological approach to friction sketched above, for a while, and examine it from a more systemic perspective.

Let us consider with Rosa (2013; 2019) that not all spheres of society accelerate at the same rate, and that some regions of social life do not accelerate at all, or that further acceleration of already accelerated processes comes only at an ever-higher (energetic) price. In this case, dynamic stabilization occurs at the cost of overtaxing and pressuring less "acceleratable" phenomena, such as "slower" social systems, or the recalcitrant temporality of the natural replenishment of resources and the human body and psyche. The latter, for example, fall into what Rosa (2013, 81-83) identified as "categories of inertia" as "natural limits" to acceleration. However, what seems decisive about "limits" to acceleration is not so much the intrinsic "inertia" of specific processes, but rather the friction they exert, at least temporarily, in their interfaces with faster spheres of society. We can also understand, in these terms, the crises of late modernity that Rosa (2015) attributes to the escalatory movement of dynamic stabilization – i.e., the ecological, democratic, financial, and psychological crises – as the precipitation of massive, socially and existentially debilitating configurations of friction.

As competition and the fear of falling behind on the "slippery slope" (Rosa, 2013, 117) of the accelerated society force both institutions and individuals to catch up with faster processes, coping with friction takes the form of strategies for "resynchronization" (cf. Rosa, 2013, 263, 266, 269). As I read it, the interaction of *social acceleration, friction, and resynchronization* strategies both activates the dysfunctional pathologies of accelerated society (Rosa 2010, 69-73) and what Rosa (2010, 74-77) called the "silent normative force" of temporal coordination and social integration in modernity. At this point, we find the most prominent position for technology in Rosa's work. When the friction generated between accelerated social processes, especially the resulting "contraction of the present"[3] (Rosa, 2013), and the limited material and cognitive resources individuals and collectivities have to cope with them is too great, technological acceleration is deployed. Embedded in the feedback loop of social acceleration, technology functions as a dissolver of resistance, facilitating further acceleration (Rosa 2013).

In light of the concept of dynamic stabilization, one finds in Rosa's thinking a two-sided relation between technology and friction. On the one hand, technology, or more precisely, the application of technical solutions to dynamize goal-directed processes, is employed by industry, organizations, and individuals as a means of further accelerating and growing when acceleration and growth encounter material limits. In other words, it appears as a "friction dissolver". On the other, as an enabler of further acceleration, technology seems to open, through the socioeconomic mediation of competition and a structural drive to growth, new configurations of overtaxing friction.

Beyond the "structural" role friction plays in Rosa's diagnosis, his work also offers a "cultural" account through which prevailing practical interpretations of friction as an obstacle to be overcome can be understood – most notably in what he characterizes as the cultural promise of acceleration and its implicit conceptions of the good life, which can be interpreted as carrying an expectation of frictionlessness, from *Social Acceleration* to his later reflections on "non-disponibility" (*Unverfügbarkeit*) (Rosa, 2020).

Despite the idea of a privatization of the good, Rosa (2017) has contended that the conduct of

[3] This term is borrowed from Philosopher Hermann Lübbe.

life in modernity is directed toward a "fixation on resources". "By consequence, the ethical imperative that guides modern subjects is not a particular or substantive definition of the good life, but the aspiration to acquire the resources necessary or helpful for leading one" (Rosa 2017, 443; also 2019, 21ff.). We find the most acute expression of this implicit conception of the good life in Rosa's conflation of the cultural promise of acceleration with the religious promise of transcending finitude. Here, it is not the accumulation of material resources itself that counts, but the possibility of expanding the "enjoyment of worldly options", and the promise of reducing the chasm between our limited "time of life" and the unlimited "time of the world" (Rosa 2013, 179-182). Beyond this acute expression, Rosa identifies this attitude, especially in his later focus on world-relations and the forms they take in modernity, at the most basic, existential level of our forms of life.

Simultaneously underlying and being prescribed by the institutional and cultural framework of modernity, this basic world-relation precipitates into a mastering subject and a world revealed as a "point of aggression" (Rosa 2020, 6). In other words, it *discloses the world as a source of resistance* (Rosa 2019, 420-424).

> The sociocultural formation of modernity thus turns out to be, in a way, doubly calibrated for the strategy of making the world controllable. We are structurally compelled (from without) and culturally driven (from within) to turn the world into a point of aggression. It appears to us as something to be known, exploited, attained, appropriated, mastered, and controlled. And often this is not just about bringing things – segments of world – within reach, but about making them faster, easier, cheaper, more efficient, less resistant, more reliably controllable (Rosa 2020, 14).

To render the world at our disposal, *verfügbar,* i.e., "available" to us, is for Rosa the culturally predominant approach to collective and individual self-efficacy. And while technology is not the sole element in the constitution of the modern program of "making the world available"[4] (*Verfügbarmachung von Welt*) (Rosa 2020; also, 2019, 420-24), it appears in Rosa's account in the arrangement of phenomena that sustain it. In any case, we can read such a cultural attitude as a decisive expectation of frictionlessness; of a world whose "non-disponibility", "elusiveness", and "illegibility" is only temporary.

Now, returning to the phenomenological perspective on technologically mediated practices, what is the consequence of this sociocultural articulation of friction for the conception of human-technology relations? Recapitulating the idea that friction indicates discontinuities in relatedness through which engagement takes place, as well as points of vulnerability in our technologically mediated engagement with the world that require care and investment, we identify in Rosa's reconstruction of modernity a) a structural logic that pressures and overtaxes these discontinuities, and b) a cultural pattern of interpretation in light of which these discontinuities are revealed as obstacles to the good life.

Firstly, the escalatory logic of acceleration and growth, mediated by competition, favors practices in which technology is embedded not only in a process of dynamization and subjugation of limits, but also of "catching up", of "resynchronization" with an ever-faster reality. Understood within this praxiological context, the subjectivity and the world revealed by technological mediation are tendentially in a conflict-prone disposition to one another, as a runaway world and an insufficient subject. Moreover, as technical artifacts increasingly acquire agential capacities through different levels of automation that are better adapted to the demands of resynchronization than the human body, they become a critical source of pressure. Since the 19th century, the idea of the human body as a defective machine, a "faulty construction", inferior to the power and versatility of industrial artifacts, has been a powerful image in philosophical and engineering imagination (Anders 2018; Heßler 2025). The experience of insufficiency, of "desynchronization", or being

[4] In the official translation: "making the world controllable" (Rosa, 2020, 14).

lagging behind is consistent with an experience of friction as a performative gap that does not lead to attentive, "appropriating" engagement, but to a concern for resynchronization through (self-) optimization.

Secondly, in the opposite direction, the cultural *promise of availability, accessibility, and attainability* (Rosa 2017) also favors the conception and design of technologically mediated practices oriented towards disengagement. While technological embodiment, in Ihde's (1990) sense, strives for the achievement of a level of seamlessness through which the artifact withdraws and simply extends the user's perception of the world, what seems to be the promise of the consumer-oriented design of modern technology is the possibility of reducing the need for investment (learning, adaptation, skill development) in this withdrawal. In digital mediations, a design philosophy of frictionlessness (Kemper 2024) appears to orient human-technology relations, such as in 1-click buying buttons or doomscrolling in social media. However, one finds such a conception of human-technology relations in many other areas not necessarily connected to consumer service, such as automation designs in aviation that envision "pilot-proof" airplanes (Langewiesche 2010, 103). At a deeper level of cultural praxis, this designed disengagement has been described by Albert Borgmann (1984) as a paradigmatic characteristic of modern technical artifacts and the form of life they embed, which he termed the "device paradigm". Devices promise to furnish our lives with functions, or "commodities", without making demands on our attention, care, or skills; they "disburden" our lives but, in doing so, also disengage us (Borgmann 1984, 40-8).

Technology and the qualification of world-relations

In the introduction, I claimed that current developments in the philosophy of technology point to a dismissal of questions concerning an overarching logic of modern technological development and the experience of alienation, which are regarded as remnants of a "classic", "essentialist", and "determinist" philosophy of technology (in particular, Martin Heidegger and Jacques Ellul). Rosa's approach to the modern sociocultural formation does not resort to technological determinism, but places technology within an *escalatory process of world-making* that cannot be explained by technical innovation, nor can it be conceived without it. I tried to show how Rosa's reconstruction points to a form of "revealing" the world's resistances as points of "aggression" – as he terms it in *Unverfügbarkeit*. This revealing, as in Heidegger, is critically examined by Rosa against the backdrop of its "danger" of reifying world-relations; the danger not simply of heteronomy, but of a mute, dead world which no longer responds to us. Unlike Heidegger, however, Rosa's critique is grounded in a systematic account of modern structural logics and cultural praxis, which can provide an entry point to a sociological account of "enframing".

However, while Rosa's reconstruction of modernity helps us identify a historically particular dynamic of the imbrication of technology and sociocultural formation, his thematization of the technical domain tends to reduce it to its instrumentalizing dimension. Technology mainly appears as a culprit in the "resonance catastrophe" of modernity and, at best, as an external necessity, a material condition for resonant relationships to be established. More importantly for the present argument, Rosa often approaches technological mediation as a form of distancing, a disjunction of more primal, immediate forms of being in the world. In this sense, Rosa's account risks reproducing a long-standing position, evident from Romanticism to 20th-century cultural criticism, of a split between the domain of technics and the domain of meaning. As indicated in the introduction, this split is precisely what important theoretical innovations in contemporary scholarship on technology have sought to overcome in recent decades. The point here is not that Rosa's theorizing should catch up with the more nuanced accounts of contemporary technology thinkers. Rather, the point is that, if Rosa reproduces the old split between the technical and

the meaningful, his critique of world-relations might miss the opportunity to incorporate technological mediation as a central – and, in our present, most defining – moment in the shaping of our being in the world. If this split is avoided, Rosa's work could provide not only a sociological diagnosis of "enframing", but also a starting point for a positive critique that explores undeveloped, systematically hindered emancipatory potentials in technological mediation. His account of the relations we establish with things and materiality under the umbrella of the "diagonal axis" of resonance already signals this move. It addresses the responsive dimension of things and materially focused activity (e.g., baking, writing, playing), but underexplores technology as a *medium* of relations rather than simply as an other we relate with.

Approaches such as Postphenomenology (and, in an indirect way, Actor-Network theory) indicate that technical artifacts confer qualities to the way we experience the world and act; what they leave largely unexplored, however, is how such *qualification processes* take shape in practice, through appropriation, engagement, and experiences of self-efficacy and agency. A Rosa-inspired critique of technologically mediated world-relations would change focus to these processes. It would ask how technical artifacts and practices enable or disable appropriation as "adaptive transformation" (*Anverwandlung*) of "segments of world" and enable or disable the sedimentation of sensibilities, cognitive dispositions, and skill. To pursue this task, however, we need to accept, in the first place, that technical artifacts and practices do not simply concern appropriation (*Aneignung*) as rendering the world "mine" to be used.

Let us take some of Rosa's own examples.

Exemplifying the basal condition of our bodily relationships with the world, Rosa (2019, 47-48) commented about the use of shoes:

> Certainly, it makes a difference whether we stand in the world barefoot or shod [...] Shoes establish a highly effective "buffering" distance between body and world that allows us to move from a participative to an objectifying, reifying relationship to the world.

Elsewhere, he draws our attention to how different technical artifacts and practices increase our reach over the world, in an escalating order.

> [...] our first bike drastically expands the horizon of what we can reach on our own, of our own volition. Now I can ride to the lake, to the woods at the edge of town — "my" world is now noticeably bigger [...] Finally, with airplanes, London, Rio, and Tokyo all appear on the horizon of the reachable and, with rockets, the moon [...] And, while the telephone extends our acoustic reach only as much as the radio does – but at an individual level – smartphones complete the movement, ushering in an unbelievable expansion of our share of the world [...] The world is now at our fingertips in a historically unprecedented way (Rosa 2020, 11-12).

It seems out of question that shoes (and all other "wearable" artifacts) create a distance between our bodies and the world, and that transport and communication technologies have increasingly augmented our capacity to reach different segments of world. But as such, they do not necessarily make us less engaged with the world, not if we understand that they themselves become constitutive of the world and our practices. A "shod" human-world relation is perhaps less concerned with the ground temperature and thorns, but the "overcoming" of such barefoot friction that shoes enable depends on our engagement with new kinds of friction, such as "learning" how to walk in shoes. Walking in shoes outdoors is so ingrained in our modes of being in the world since our earliest childhood that we can hardly imagine it as a "skill", at least until we try a completely different type of footwear (e.g., high heels). This type of engagement with friction is much more evident when learning how to ride a bike, drive, or fly an airplane. Beyond the relation between the human body and the technical artifact, we also find friction in the world that human-technology arrangements disclose. Moreover, the worlds of hiking, driving, flying, or telecommunicating are themselves susceptible to breakdowns and cannot be taken for granted: they require maintenance, protection, and adaptation to ever-changing conditions. In short, they are never really "conquered". And it is precisely

because of this constitutive incompleteness that human-technology relations must be investigated in terms of processes of engagement that are dynamic and (potentially) transformative.

Towards a critique of technologically mediated world-relations

Decisive for a critique of technologically mediated world-relations, therefore, is not the identification of how much mediation there is between self and world, but of how mediation qualifies our being in the world through the forms of engagement it enables and disables, the vulnerabilities it discloses and conceals. Also, as I have tried to demonstrate with Rosa's own account of modernity, this critique should consider human-technology relations within sociocultural formative logics and interpretative patterns that transcend immediate contexts of use and favor (or even presuppose) particular kinds of technologically mediated practices and artifactual design.

Foregrounding the friction of mediation, such a critique could not only examine how prevailing modes of social reproduction and interpretation of technology unfold in concrete dealings with discontinuity, resistance, and vulnerability, but also explore alternative – yet systematically hindered – forms of embodiment and senses of agency that are immanent to technologically mediated practices themselves.

Phenomenologically, as discussed above, friction is not simply the moment of disruption or disadjustment between the human body and the artifacts that mediate world-relations. As discontinuities in relatedness, friction also denotes becoming in our interactions with artifacts and with the world through them. In a broad sense, this focus on friction would allow examinations of human-technology relationships that emphasize the processuality and unfolding character of technological mediation beyond situational encounters. It would enable a consequential articulation of the materiality of mediating artifacts and the "techniques" of the living body, which, as already noted (Secomandi 2015), is often sidelined by the classical postphenomenological approach. Programmatically, foregrounding the friction of mediation could open an avenue between contemporary approaches to technology (which have tended to emphasize artifactuality) and the interest in the embodied sedimentation of sensibility, cognition, agency, etc. found in concepts like as Marcel Mauss's (1973) techniques of the body, Pierre Bourdieu's (1977) body *hexis*, Hubert Dreyfus' Heidegger-inspired skillful coping (Dreyfus e Wrathall 2014), and Richard Sennett's (2008) craftsmanship.

Likewise, in view of this existentially qualifying role of technological mediation, one could also explore the question of how to conceive "making" beyond the paradigm of a sovereign subjectivity, without dismissing self-efficacy as a central element of the human enterprise of world-making. Beyond whether the conception and implementation of this or that technology serve the production of a world that better suits human needs for dignity, freedom, equality etc., the question of self-efficacy concerns our everyday dealings with the world and our agency as participants in the "production" of our lives. Resonance theory offers a systematic account of an alternative conception of self-efficacy, geared toward responsivity and the experience of being able to touch, influence, and shape the world without aiming to render it a passive or lifeless object (Rosa 2019). By integrating technological mediation as a frictional dynamic within Rosa's critical model, we could begin sketching the contours of a critical theory of technology that seeks to rehabilitate responsivity and care as constitutive, even if unfavored under growth and acceleration imperatives, of the *Homo faber*.

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