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Superplants: hegemonic masculinities holding up the green transition

Superplantas: masculinidades hegemónicas que sostienen la transición verde

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Abstract
This paper departs from a consideration of an emerging popular discourse concerning a plant-based mining technology called agromining. Agromining is defined by its inventors as a method for mining metals with plants, encompassing a chain of procedures from the cultivation of metal-absorbing plants to the marketing of the pure metal extracted from them. It is being developed and marketed by scientists as an environmentally friendly alternative to traditional mining that can support technological shifts needed for the green transition. Following the characterization within this popular discourse of the agromining plants as "super", the hegemonic logics behind it are exposed and used to unpack the agendas, political biases, and naturalized ideologies behind green technologies. This paper investigates why being super is so appealing and what logics are upheld and reproduced by prioritizing superness. Three central elements construct the main argument of this paper: hegemonic masculinity, the depoliticization of climate change, and the lack of a plural democratic space to address the global ecological crisis. These points give context to why superness may be an attractive quality for a green technology and help to problematize the neutrality of science-backed solutions to ecological problems. Possibilities for refusal and resisting both hegemonic masculinity and the dominant logics that reproduce it are discussed with contributions from Feminist, Queer, and Crip theories.
Keywords: agromining, hegemonic masculinity, climate change, technological innovation, superness, green transition. JEL: O33, Q54, Q55

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Resumen

Este artículo comienza por la consideración de un emergente discurso popular ligado a una tecnología minera basada en plantas llamada agrominería. La agrominería se define por sus inventores como un método de extracción de minerales con plantas, abarcando una cadena de procedimientos que van desde el cultivo de plantas absorbentes de metal hasta el marketing comercial del metal extraído. Esta siendo desarrollada y promovida en el mercado por científicos como una alternativa amigable con el medio ambiente a diferencia de la minería tradicional, que puede sostener cambios tecnológicos necesarios para la transición verde. Siguiendo la caracterización de estas planas como 'super', proveniente del mencionado discurso popular, las lógicas hegemónicas detrás de él son expuestas y utilizadas para desvelar las agendas, sesgos políticos, e ideologías naturalizadas detrás de tecnologías verdes. Este artículo estudia por qué ser 'super' es tan atractivo y qué lógicas se mantienen y reproducen cuando se prioriza la superioridad. Tres elementos centrales construyen el argumento principal del documento: masculinidad hegemónica, la despolitización del cambio climático, y la falta de espacios democráticos plurales para abordar la crisis ecológica global. Estos puntos entregan antecedentes para explicar por qué la superioridad puede ser una cualidad atractiva para una tecnología verde a la vez que ayudan a problematizar la neutralidad de soluciones científicas para problemas ecológicos. Posibilidades para rechazar y resistir masculinidades hegemónicas y las lógicas dominantes que las reproducen son discutidas en dialogo con contribuciones de las teorías Feminista, Queer y Crip.

Palabras clave: agromineria, masculinidad hegemónica, cambio climático, innovación, superioridad, transición verde.

1. Introduction

"we can conclude that it is not super powers per se that makes one super, but rather being super entails being *superior*. In this sense, the state of being super seems to include a relative element: the relation to that which is not super" (Wandtke & Anton, 2011).

In January 2017, a documentary film with the title "Superplants - How to make money by saving the environment" made by the Franco-German television network ARTE was broadcast to European audiences (Uhrig & Krause, 2016). This film documented and circulated the promises of an emergent agricultural technology called agromining (Figure 1). Agromining is defined by its inventors as a method for mining metals with plants, encompassing a chain of procedures from the cultivation of metal-absorbing plants to the marketing of the pure metal extracted from them (Van der Ent et al., 2020). It is being developed and marketed by scientists as an environmentally friendly alternative to traditional mining. Currently, agromining cannot replace traditional mining as the scale of the global demand for mined materials outweighs the yield possible from this plant-based alternative (Uhrig & Krause, 2016). However, agromining is described as extremely beneficial when it comes to lower-grade ores that would not be profitable enough to interest mining with traditional methods. This is because agromining costs significantly less than traditional mining to deploy and is in turn able to accumulate high yields of metal from areas that would not be financially interesting to larger-scale mining (2016). Additionally, this technology can be used to remediate soils contaminated by metals thus providing two services: remediation and extraction (The University of Queensland Sustainable Minerals Institute, 2017). This film, "Superplants", describes agromining as an almost magical process that due to the findings of modern science might provide a way to mitigate pressures on the environment caused by a global demand for mined materials. The protagonists of this film are the special plants that are able to accumulate metals from soils. Plants with these propensities are known to scientists as hyperaccumulators. In the film, however, they are given the additional appellation of *superplants*.

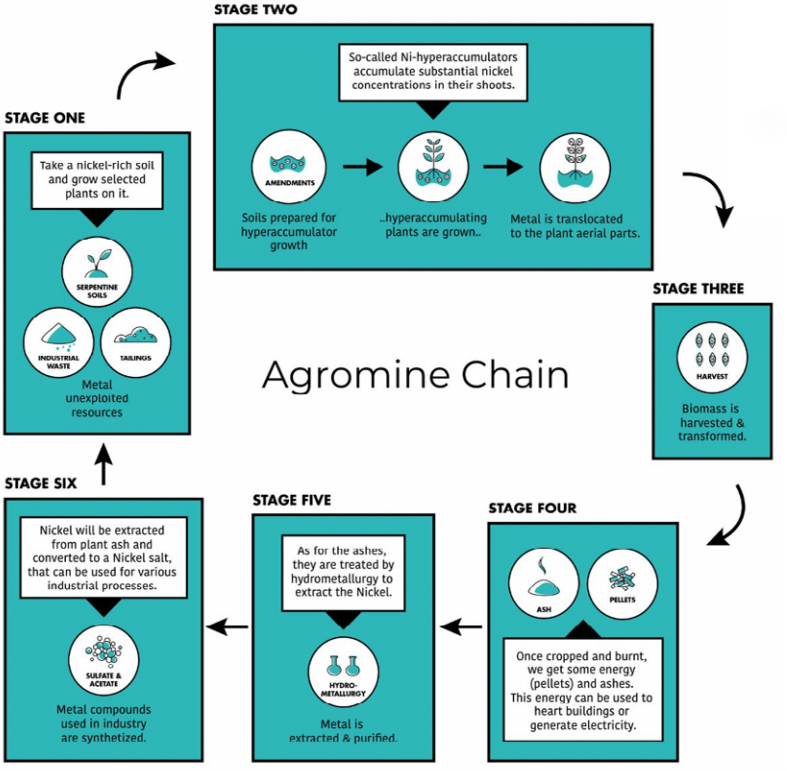

Figure 1. *The Agromining Chain*. Life Agromine Project via LinkedIn. May 2021. https://www.linkedin.com/company/life-agromine/posts/?feedView=all

Growing pressure to adapt and prepare for global change creates conditions wherein action is expected. Whether on an individual, local, national, or international scale, specific pathways are being developed to respond to this global change. These pathways are entangled with existing and often dominant ideas about the world and are therefore in no way neutral (Kenis & Lievens, 2015). In the present case, though the moniker *superplants* can be dismissed as a marketing strategy devised to interest a broad audience, it is worth considering what narratives are being perpetuated in its adoption. In particular, the draw of "superplants" and the quality of superness

when framed within the growing relevance of technological solutions to problems of climate change produces the question: why is superness so appealing? What logics are upheld and reproduced by prioritizing superness?

Prominent feminist scholars Rosi Braidotti (2019) and Elizabeth Povinelli (2016), identify the pervasive preferencing of an "ideal" being, the cis-White Man rooted in the origins of modern science. The dual logic upheld in this hegemony is 1) the naturalization of the human form as white, cis-male and able-bodied and 2) the exclusion of all deviations from this ideal form as "deviant" and subpar. This hegemonic logic has serious consequences as power, access, and resources have historically been distributed along gendered and racialized lines as well (MacGregor & Seymour, 2017). Critical ecofeminism and masculinity scholars have demonstrated how the dominance of this ideal human has a significant effect in the discourse on climate change because of the influence of hegemonic Man's beliefs about nature (Graad, 2017; MacGregor & Seymour, 2017). These beliefs define a relationality with the environment where "humans are somehow separate from and above nature, and humans must control nature (…) [through] physical, economic, political, military, ecological, psychological, emotional, and sexual dominance." (Gaard, 2017, p. 107). When it comes to the innovations developed by technoscience these "dominant political discourses compel scientists to create assessments that work within these discourses" (Turnhout et al., 2014, p. 583 in Carton, 2019). Furthermore, these technologies involve "the articulation of problems that are legible to, and the proposal of solutions compatible with, dominant political and economic logics." (2019, p. 761).

Asking why superness is so appealing as a quality for tackling climate pressures implies that approaches to climate change should not be taken for granted. In particular, techno scientific innovations such as agromining are embedded in political and social processes that are often overlooked or naturalized in the name of innovation and progress. Though much has been written in the field of innovation studies about the positive value of technology for social and political

transformation, less attention is paid to the disproportionate advantage of certain actors over others with less influence (Van Dyck et al., 2021). It is therefore important to consider what hegemonic logics are serviced by the discourse of superness in order to think through which agendas are prioritized, and more importantly which bodies are potentially ignored and made vulnerable.

In this paper, two examples of the mediatization of agromining are presented to reveal political processes and dominant logics that are being upheld. These examples are used to problematize the categorization of these plants as "super". By considering this discourse through the lens of hegemonic masculinities, I show that the characteristics that make this technology marketable uphold and reproduce patriarchal logics elevating the category of men over others.

The task of this paper is to think through the deployment of superness as a marketable quality. In doing so, the attraction of both superness and the technology it describes is questioned and located within a context of hegemonic masculinity. This approach yields two discussions. Firstly, appealing to techno-scientific solutions as a way to unify a population behind hegemonic logics and against the threat of climate change depoliticizes the debate, thereby making it challenging to contest without becoming marginalized. And secondly, superness when read through a queer lens presents a way to resist or remake artefacts of hegemonically masculine discourse.

This argument has implications for the development of techno innovations that address symptoms of climate change. In problematizing the hegemonic masculinities embedded in a popular agromining discourse, I aim to make visible and politicize latent gendered ideals dominating techno-scientific solutions to climate change.

2. Literature: superness in context

2.1 Hegemonic masculinity and climate collapse

"Indeed, in every society on the planet, those with the most wealth and power to shape and control the natural world—for better or worse— have been men" (MacGregor & Seymour, 2017, p.4)

The naturalization of a dominant form of masculinity with idealized values and practices that is legitimized by society at the cost of subordinating other categories is called hegemonic masculinity (MacGregor & Seymour, 2017). Hegemonic masculinity is a concept used by feminist scholars who aim to problematize an ideal form of masculinity and examine the category as shifting, plural and contested (MacGregor & Seymour, 2017). Because of the historic privileging of men as the ideal of Man (humans), the fact of their gender has benefited from being categorically unmarked (MacGregor & Seymour, 2017). In other words, "Man" was the accepted unit of measure for all things. Other *marked* categories are distinguished because of their deviations from the "naturalness" of white Man, and do not have the privilege of escaping this marking. Such marked categories include people of color, women, and queer people (MacGregor & Seymour, 2017). Being an "unmarked" category makes it seem natural that white men have historically held the most influence over the natural world. Recent engagements with the study of hegemonic masculinity are helping to reevaluate Western ideas about the modern world and show that the study of Man that informed these ideas was determined by a biased vantage: the perspective of white men (2017).

The concept of hegemonic masculinity has specific relevance for discussions of the environment as it can reveal a model of human dominance over nature that is largely upheld in dominant social discourses. This can be simply represented by the following configuration, "eight billionaire white men control the same amount of wealth between them as the poorest half of the Earth's population" (MacGregor & Seymour 2017, p.11). Further, a 2022 Oxfam report says that this disparity is increasing (Oxfam, 2022). Masculinity scholar Jim Fleming recalls the historical precedence of

men dominating nature through science, technology and innovation and calls for a consideration for the political, social and ethical consequences that underpin this action (2017). Fleming traces Sir Francis Bacon's *The Great Instauration*, a program to catalog and control the natural world. Bacon was a misogynist who excluded women from his study of nature and used overtly sexualized language: "science is a chaste and lawful marriage between Mind and Nature that will bind Nature to man's service and make her his slave." (Bacon, 1642 quoted in MacGregor & Seymour, 2017, p.26). With this foundational paradigm of modern science in mind, it is important to question how it might be upheld in the application of techno-scientific solutions to climate crisis. In making visible the political biases underpinning modern science, these authors (Fleming, 2017; MacGregor & Seymour, 2017) problematize the neutrality of scientific discourse.

2.2 Innovation and resistance

Important scholarship has been generated on the project of refusing the neutrality of innovation discourses (Van Dyck et al., 2021). Van Dyck et al. (2021) unveil a climate wherein innovations are a "gift" from the technoscience that has to "be accepted" without the option of refusal. The authors explain that the practice of innovation is an "evolutionary branching process" that should involve a space for refusal in order to avoid impartial results and advocate for alternative pathways to those of hegemonic interests. Criticizing the lack of plurality and divergence present in innovation processes they remind us that:

> [j]ust like other sociopolitical dynamics, research and technological change involve societal choices among a diversity of possible pathways. Path-dependency and lock-in as well as multiple power laden dynamics of entrenchment tend to reinforce those pathways favored by incumbent interests. (Van Dyck et al., 2021, p. 3)

Scholars in the field of queer and Crip innovation bring forth another example wherein a dominant interest (white men) is

unable or unwilling to invest in realities that center on so-called marked categories such as racialized groups, women, queer folks, and disabled communities. The "Crip Technoscience Manifesto" (Hamraie & Fritsch, 2019) agitates the normativity of ableism in technoscience discourse by claiming the agency of disabled people as "experts and designers of everyday life" who also "harness technoscience for political action, refusing to comply with demands to cure, fix, or eliminate disability" (Hamraie & Fritsch, 2019, p. 2). Likewise, queer interventions in hegemonic discourses reveal their narrow scope and demonstrate how alternative perspectives and marginalized voices should be part of innovative processes in order to more adequately match the plural societies they address (Maris, 2017; Weder & Samanta, 2021).

2.3 Climate change and the political

A further aspect that gives context to the agromining mediatization case study, is the depoliticization of climate change. Following Kenis and Lievens (2015), this can be broken down into three central points: climate crisis lacks a subject of change; the object of climate crisis is too vast (potentially includes everything); and the unquestionable basis of climate policy on 'nature' as an external issue that can be addressed by objective scientific study. The dominant approach to address the complexity, extent, and diffusion of ecological crises is through technical or economic means (Kenis &Lievens, 2015). This is due to the fact that these means "give the impression to be neutral and could therefore help to avoid potential adversity and find common ground" (p.25). Likewise, this appeal to the results of scientific inquiry as a consensus-making pathway to address conflicts such as climate crisis, makes it very difficult to disagree with this position (Swyngedouw, 2010). Any disagreements that might occur are then framed within the narrow scope of ideology. This in turn means that the person disagreeing "on non-technical, but social, moral or political grounds will have to undertake extra efforts to create a space where her point can become visible or hearable as such" (Kenis & Lievens, 2015, p.27). Appealing to the

path of consensus by defining one's arguments as post-politics or apolitical is another approach used by actors in the climate struggle (Kenis, 2021). This is done, according to Kallis and Bliss (2019), in an effort to avoid the gridlock of right-left political positions and resurrect a myth of unity. However, according to Kenis (2021), without the agonism of the political, wherein division and conflict are mobilized, "the constitutive dimension of conflict and plurality" are devalued (p.137). It is therefore argued by Swyngedouw that an inclusive space for effective dialogue to occur is lacking:

[i]n the context of environmental issues, we similarly need to create a plural and democratic space in which it becomes possible to make visible the existence of conflicting and alternative trajectories of future socio-environmental possibilities and of human-human and human-nature articulations and assemblages. (Swyngedouw, 2010, p.228)

3. Discussion: Agromining in the media

The media attention to agromining has been significant in recent years (Adams, 2019; Eppendorf, 2021; Morse, 2020; Rochmyaningsih, 2020; Yan, 2020). This is due in part to the funding of developments in this agrotechnology, as well as to the emergence of a market for green technologies that can support a transition to a green economy (Nkrumah et al., 2022). The "Superplants" film mentioned in the introduction to this paper, is one such mediatization. It was broadcast in German, French, and English at several film festivals where it won the UMSICHT-Wissenschaftspreis (The University of Queensland Sustainable Minerals Institute, 2017). The rhetoric used in this film recalls a sense of wonderment reminiscent of David Attenborough documentaries, emphasizing the incredible possibilities that these superplants provide. Promotional material from the film summarizes this sentiment:

Just imagine there were superplants. Plants that are quite normal in appearance but possess almost magical abilities. Little plants, which could help humanity get to grips with some of its most intractable problems: environmental pollution, shortages of

raw materials, malnutrition, poverty and the destruction of the rainforest. These superplants exist! So-called hyperaccumulators are plants that store so many heavy metals in their leaves that you can use them to decontaminate soil. Others can even be used to gather the accumulated raw materials. (Mediawave Festival, 2017)

As the promotional blurb succinctly describes, these superplants are found interesting by the filmmakers and innovators they follow, because of their potential to offer a service. In particular, it is their potential to attend to the infrastructural pressures of global mining and agricultural industries that contributes to their superness. In the film, the superplants are portrayed as miraculous and special (Figure 2). While other species of plants would normally die in metal-toxic soils, these superplants can survive and even thrive. Informed by this super-capacity, they are framed within a narrative of heroism, where the superplants come to the rescue of humanity (Mediawave Festival, 2017). The characteristics that qualify them as "super" are their hardiness, resilience, and hyper-capacity. These are historically gendered terms, meaning that they characterize a specific ideal of masculinity, an ideal that is currently and has been historically hegemonic. As explored above, it is important to interrogate *superness* within the context of hegemonic masculinity to demonstrate that current discourse around agromining largely reproduces the dominance of this hegemony.

Figure 2. Agromining scientist Antony Van der Ent pictured in the film interacting with the superplants behind a fog of smoke using undescribed practices to study the unique capacities of these plants. From *Superplants: How to Make Money by Saving the Environment. Uhrig, Klaus, and Till Krause, dirs. 2016..Florianfilm GmbH.*

To discuss this further, I describe another example of the mediatization of agromining as "super". This will help show that in addition to upholding a hegemonic version of masculinity, it also reproduces the problematic that is the depoliticization of climate change by articulating a singular pathway towards a solution. This singular pathway is defined by the employment of science and innovation (Kenis, 2021). The publication in which agromining is rendered as super, is material from a marketing campaign produced by the German industrial giant, Schaeffler. This publication is titled, "Tomorrow: EXPERIENCING TECHNOLOGY WITH SCHAEFFLER." It aims to show how the company is thinking holistically about its role in affecting change: "When it comes to the big picture – currently being unhinged by the powerful game changer of climate change – the whole world needs to join forces: the political, industrial and business community, and each and every one of us" (Brauer et al., 2019, p.3).

Claiming that climate change is a problem facing the whole world may seem like a neutral and obvious position to take based

on what science tells us, but political ecologists and philosophers contest this (Žižek, 1994; Kenis, 2021). Firstly, as Kenis (2021) lays out, Žižek's definition of the "masterstroke of ideology" is its success in appearing neutral, apolitical, or "merely scientific" (p.141). That a focus on a "pure science" will deliver apolitical answers to planetary challenges hides the fact that "science is a political and social process that cannot be free of values" (Kallis and Bliss, 2019, p.473). Instead, scholars of political ecology ask what political processes shape scientific knowledge production about environmental change (Robbins, 2019). By bringing "apolitical" ecologies into the realm of the political, issues such as ecoscarcity, modernization, valuation and conservation can be viewed as sites of power and governance (2019). When this criticality is applied to the *Tomorrow* publication's trust in innovation as a solution to planetary challenges, the existence of an ideology of technocratic solutions is laid bare and the political act of enacting this ideology as a business strategy is highlighted.

The second point related to the *Tomorrow* publication's framing of climate change as a common enemy that requires "joining forces" is the notion that a pathway for addressing climate crisis involves consensus. As discussed in the literature section, this claim has been problematized because it homogenizes the subject of climate change. This homogenization erases the violence, so-called solutions, and ontological understanding of climate change (Kenis, 2021; Kenis & Lievens, 2015; Yusoff 2018).

4. Conclusion: Queer Openings

The two sites of mediatization discussed above are examples of where a political dimension has been (consciously or not) concealed, and the agendas rendered neutral and uncontestable. So far in this paper, I have tried to show how dominant logics are sustained and reproduced in these agendas and their strategies. The concealed political processes I have attempted to bring forth are (a) describing an emergent agro-industrial technology as "super" reproduces hegemonic masculinities; (b) techno-scientific solutions are not neutral but rather politically determined; and (c) appealing

to techno-scientific solutions as a way to unify the population against the threat of climate change relocates the discourse beyond the political, making it difficult to resist or offer alternatives without them being dismissed as purely ideological. In addition to this critique, it is also interesting to consider what openings or possibilities come with these mediatized sites.

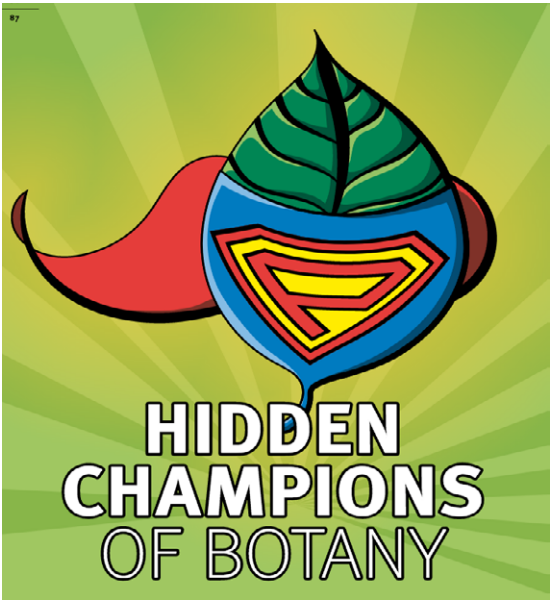

Figure 3. *Hidden Champions of Botany*. Brauer et al. (2019, p. 87)

One such opening could be explored through the topic of queering superness. Though superness in the context of agromining can be simply a synonym for the prefix "hyper", accompanying graphics and a hypermasculine discourse point to a specific correlation between superplants and superheroes (Figure 3)[1] . Beneath the caption *Hidden Champions of Botany* is the following subtext: "In the near future, inconspicuous plants with natural superpowers might help us stop famines, the destructive overexploitation of raw materials or climate change" (Brauer et al., 2019, p.87). However, another related article emphasizes this superness in a different light

by appreciating the plant's abnormal thirst for metals, with the title "Some Like It Toxic" (Eppendorf, 2021). This title plays on the subversive queer classic "Some Like It Hot" (Wilder, 1959) and recalls the film's famous last moments (Figure 4) wherein Daphne (Jack Lemmon's character in drag) reveals to her unwitting partner Osgood, that she is in fact not a woman - to which Osgood responds, "Well, nobody's perfect!" demonstrating an inclusivity and perhaps even homosexuality unprecedented for that time (Corcoran, 2019).

Figure 4. *"Some Like It Hot"* (Wilder, 1959) closing scene Daphne (Jack Lemmon's character in drag) reveals to her unwitting partner Osgood, that she is in fact not a woman - to which Osgood responds, "Well, nobody's perfect!". Unknown image author, unknown date, https://www.pinterest.com/pin/129126714292665025/?nic_v3=1a55L1IGZour

Theoretical traditions such as queer theory, crip theory, posthumanism and feminist criticism continue to develop new ways of reading and subverting "deviations" from the ideal human that are useful for an alternative trajectory for agromining's superness (Camp, 2017). Tracing the narrative of a gay superhero, Lisa Camp (2017) recalls Derrida's claim that the deconstruction of a discourse such as hegemonic masculinity requires: (a) affirming this discourse exists and operates and (b) that reworking this discourse can mean reappropriating the tools that made this discourse dominant. In the case of the superness of agromining, focusing on the abject appetite for toxicity as a quality of superness could lead to new openings for what superness can be (Author, 2021). Though the extent to which this queering of superness is possible will depend on how it is ultimately represented in the media and internalized as well as applied in people's experiences of agromining, I consider it an opening to rethink these dominant logics. In closing, to truly prepare and materialize a green transition, face global ecological crises and make such queer openings more than critical exercises, it will be necessary to, echoing Kenis and Swyngedouw, demand a democratic space that allows for plurality and conflict. Without this step, the dominant logics, crucially including hegemonic masculinity, that played a leading part in shaping these crises, will continue to be reproduced.

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Notas

[1] Hyper- and super- are doublets, or two words with a shared etymology in Latin and Greek, that have entered modern usage through both roots. T. F. HOAD "hyper- ." The Concise Oxford Dictionary of English Etymology. . Encyclopedia.com. (June 3, 2022). https://www.encyclopedia.com/humanities/dictionaries-thesauruses-pictures-and-press-releases/hyper-1

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