
Doniwen Pietersen*, Dean Collin Langeveldt & Arrie Van Wyk

* Corresponding author:
Email: doniwen.pietersen@spu.ac.za

Department of Education Studies, School of Education, Sol Plaatje University, Kimberley, South Africa.

ABSTRACT
This conceptual article explores the profound impact of techno-rationalism on educational law in Southern African universities. It also examines the influence of techno-rationalism on equity, social justice and academic freedom within higher education in the digital era. The article critically analyses the reshaping of educational law in Southern Africa by considering technological advancements, economic forces, affective factors and socio-cultural dynamics. It aims to investigate whether the implementation of techno-rationalist discourses hinders social justice aspirations in universities. Additionally, the article explores how pervasive neoliberalism and market-driven logic are at universities, questioning whether these practices overshadow the institution’s core objectives and commitment to social justice. The article envisions possibilities for reconceptualising the university in the era of techno-rationalism through the critical pedagogy theory. This theory is relevant to this work because it promotes an emancipatory theoretical framework that challenges learning environments, especially higher education institutions, where people might be politically, socially and economically disempowered. It also calls for a holistic approach to knowledge, curriculum and pedagogy that recognises the university’s embeddedness in a broader ecological and socio-cultural context. Through this exploration, the article contributes to the scholarly discourse on the decolonisation of universities and seeks to inspire new lines of enquiry addressing inequality and the pursuit of social justice in Southern African higher education institutions.

KEYWORDS
Techno-rationalism; educational law; Southern African universities; social justice; Freirean critical pedagogy; decolonization; decomposition/recomposition.
INTRODUCTION
Over the past few decades, the higher education sector in Southern Africa and other regions has experienced the rapid rise of techno-rationalism, a phenomenon driven by the interplay of technological, economic, affective, and sociocultural forces (Johnson & Brown, 2019; Smith, 2017). First advanced by the German philosopher Herbert Marcuse in 1941, techno-rationalism replaces the form of rationalism that existed before technology became so pervasive in society, when human beings were free to think for themselves. It makes the bold assertion that technology, when it is widely adopted, has the power to change patterns of rationalism that existed before. This new reality has challenged the traditional concept of the university as a public good, dedicated to fostering social justice and equity (Anderson, 2018; Williams, 2020). How has techno-rationalism affected university social justice aspirations and priorities? This article examines this question by analysing the legal frameworks that govern higher education in the digital era and their implications for equity, social justice, and academic freedom within Southern African universities. Critical pedagogy theory is relevant in this work because it promotes a kind of emancipatory theoretical framework that challenges learning environments such as higher education institutions where people might be politically, socially, and economically empowered or disempowered (Dix, 2023; Egan-Simon, 2022; Lee & Lee, 2020; Morales et al., 2020; Smith, 2020).

One key area of concern is the entrenchment of the university within its own neoliberalisation. The intensified application of capitalist market logic in university management and organisation has presented challenges in maintaining university core objectives (Smith, 2019; Wilson, 2021). Put differently, universities are approached as competitive market actors seeking institutional advantage and position, and also in ascribing ‘value’ (usually monetary) to different practises and processes of HE (Williamson, 2021:57).

Administratively, market-driven logic has become deeply ingrained, potentially overshadowing the fundamental objectives of higher education. The focus on efficiency, competition, and financial sustainability can undermine the university’s social mission and its role in fostering critical thinking, democratic citizenship, and transformative learning experiences. Olawale et al. (2022) posits that, in the context of the African, democratic citizenship education focusses on the crippling impact of political autocracy as a notion that aims to undermine democratic ambitions of the public, who are more aware of the socioeconomic and political instabilities of the country and of the continent. (Olawale et al., 2022: 182)

In addition, this article addresses the enduring challenges faced by universities, such as persistent colonial, modern, and capitalist imaginaries of higher education (Brown, 2019; Davis, 2017). It contributes to the ongoing quest for social justice across ecological, cognitive, affective, relational and economic dimensions (Anderson & Williams, 2020; Johnson, 2016). By critically examining the reformulations and transfigurations of the subject associated with students, staff, and institutional cultures, we can uncover the complexities and tensions that emerge as the
university undergoes the de-recomposition process. The decomposition/recomposition that looks as though the, 
... the totality of regimes of praxes within universities that normalise the productions and distributions of patterns, of recognitions and misrecognitions according to norms that construct subjectivities, without these norms themselves being subjected to scrutiny (Seale et al., 2021, p. 137)

This article argues that techno-rationalism has a significant impact on educational law within Southern African universities. It critically examines legal frameworks, administrative operations, market-driven logic, and the potential deterioration of university social justice aspirations, where, in order to avoid being politically, socially, and economically excluded or feeling disempowered, students comply with techno-rationalism rather than challenge it. The Freirean critical pedagogy in this article helps to ask questions of higher education institutions to address these issues and to reimagine universities as public spaces that promote equity and social justice in the digital era.

Conceptual Framework
In understanding how this article engages with techno-rationalism substantial influences on educational law and culture in Southern African universities, the underpinnings of equity, social justice, and academic freedom within higher education in the digital era also need to be situated and comprehended (Zembylas, 2022). The critical pedagogy of Freire has foregrounded this work. This theory is applicable because it advocates for an emancipatory theoretical framework that questions educational spaces, such as higher education institutions, where people can be politically, socially and economically empowered or disempowered (Pietersen, 2022; Ross, 2018; Sant, 2021). Furthermore, what Freire does in his theory is to encourage dialectic engagement, which is to say, he implores any disenchanted community of society to be liberated. This can be illustrated by Freire himself in the following way, when he summarises that social justice and emancipatory violence occur whenever some people restrict others from participating in the process of enquiry (Pietersen et al., 2023; Pietersen & Plaatjies, 2023). The methods employed are unimportant; removing people from their ability to make their own decisions turns them into objects (Freire, 2021).

LITERATURE REVIEW
Techno-Rationalism and Decomposition/Recomposition of the University
Techno-rationalism refers to the dominance of technology-driven decision-making and rationality within the higher education sector (Smith, 2017). It encompasses the growing reliance on digital governance and technological systems that shape the functioning and direction of universities. The emergence of techno-rationalism in higher education can be attributed to various factors, including advances in technology, economic pressures, affective influences, and socio-cultural dynamics (Brown, 2019). These forces interact and intertwine,
creating a complex web of influences that have reshaped the contemporary university landscape.

Technological advancements, such as the widespread adoption of digital platforms and tools, have significantly transformed the higher education sector (Jones, 2018). These technologies have revolutionised teaching and learning methods, administrative processes, and research practices. Economic forces, driven by market demands and financial pressures, have led universities to embrace efficiency-orientated approaches and cost-cutting measures (Miller, 2020). Affective factors, including the emotional responses of stakeholders, can also shape decision-making and the adoption of technology-driven solutions (Wang, 2019). Furthermore, sociocultural forces, such as societal expectations and cultural norms, influence the priorities and values embedded within universities (Morgan, 2016). The interplay of these technological, economic, affective, and sociocultural forces contributes to the decomposition/recomposition of the contemporary university.

The decomposition/recomposition of the contemporary university refers to the process through which traditional structures, functions, and purposes of universities are reshaped or reconfigured in response to techno-rationalism and its associated forces (Thomas, 2021). This process involves both dismantling and reassembling elements of the university, resulting in significant changes to its organisational structure, governance practices, pedagogical approaches, and societal roles. The decomposition/recomposition is influenced by the increasing reliance on digital governance, market-oriented logic and the prioritisation of technological solutions in higher education (Adeyemo, 2023). These changes have profound implications for the university’s mission, its relationship with society and the experiences of students and staff (Anastasiou & Hajisoteriou, 2022; Liasidou & Symeou, 2018).

**The Impact of Techno-Rationalism on Social Justice Aspirations and Praxes**

The discourses associated with techno-rationalism in higher education reflect the prevailing ideologies and narratives that prioritise technological advancements and efficiency-driven approaches (Johnson, 2020). These discourses often promote the use of digital technologies and data-driven decision-making as solutions to educational challenges. However, it is important to critically examine these discourses and consider their potential implications for social justice in the university context. By exploring the underlying assumptions, values, and power dynamics embedded within techno-rationalist discourses (Phipps, 2020), we can gain a deeper understanding of their impact on the pursuit of equitable educational opportunities (Leathwood & Read, 2022; O’Keefe & Courtois, 2019).

The ascendancy of techno-rationalism in universities raises concerns about the potential diminishing of social justice aspirations and praxes (Williams, 2018). While universities have traditionally been seen as institutions dedicated to promoting social justice through education, the increased focus on efficiency, productivity, and technologically driven metrics may divert attention and resources away from addressing systemic inequalities. As market-orientated logic and administrative operations become more central, there is a risk of prioritising economic
outcomes over social justice imperatives (Thompson, 2020). This necessitates a critical examination of how techno-rationalism may influence the university's commitment to social justice and the equitable distribution of educational opportunities (Kinchengoe et al., 2011).

The implementation of techno-rational approaches in higher education can have significant implications for equitable educational opportunities (Lee, 2019). Digital technology and data-driven decision making have the potential to significantly increase accessibility and efficiency. However, it is critical to step carefully and evaluate the ramifications for social justice. It is critical to examine how the adoption of techno-rationalism may unintentionally maintain or aggravate existing gaps based on socio-economic position, race and gender. To overcome this, intentional efforts must be taken to guarantee that the integration of technology and rationalist perspectives is inclusive and takes into account all persons' needs and experiences, independent of intersecting variables (Makoelle & Burmistrova, 2020).

To truly grasp the impact of techno-rationalism in higher education, it is imperative to thoroughly examine the associated discourses. By delving into how these discourses mold the university environment and shape decision-making processes, we can effectively determine whether social justice is being upheld or undermined (Motta & Bennett, 2018). It is crucial to ensure that the adoption of techno-rationalist approaches aligns harmoniously with the pursuit of equal access to education (Gravett & Ajjawi, 2022; Stentiford & Koutsouris, 2021).

Neo-liberalization and Capitalist Market Logic in University Management

The incorporation of capitalist market principles into university administration has gained significant traction in recent times (Smith, 2017). This trend reflects a shift toward viewing universities as market-driven entities, where financial considerations and competition take precedence over the core values of education and knowledge dissemination. The adoption of market-orientated practices, such as performance metrics, cost efficiency measures and revenue generation strategies has resulted in a restructuring of university governance and decision-making processes (Greany & Earley, 2021).

The infusion of capitalist market logic in university management poses challenges to the institution's core purposes and social mission (Brown, 2019). Universities have traditionally been regarded as bases of knowledge, dedicated to the pursuit of truth, critical thinking, and the development of well-rounded individuals. However, the increasing emphasis on market-driven success indicators, such as rankings, funding streams, and student enrolment numbers, can divert attention away from the fundamental objectives of education. This shift may compromise the integrity of academic programmes, hinder intellectual freedom, and undermine the university's role as a critical site for societal transformation (Fauzi et al., 2020; Hazelkorn, 2009).

The integration of capitalist market logic into university management has undermined the core purposes and social mission of universities. The emphasis on market-driven indicators of success may divert attention away from the intrinsic value of education and compromise the institution's commitment to societal transformation. Additionally, the entrenchment of
neoliberal practises within universities raises concerns about the erosion of academic autonomy and the subordination of public interests to market forces (Ndlovu-Gatsheni, 2021).

**Educational Law in the Digital Era: Implications for Equity and Academic Freedom**

The legal frameworks that govern higher education include a variety of laws and regulations at different levels, including constitutional provisions, international conventions, regional agreements, national legislation, and institutional policies. These frameworks provide the legal foundation for the establishment, operation, and governance of universities and outline the rights and responsibilities of various stakeholders. It is important to consider these regional and international guidelines in the light of students’ right to tertiary education in the digital era.

**Constitutional Provisions and Country Legislation**

Constitutions of countries often include provisions related to education, which may encompass the right to education, principles of equality and non-discrimination, and guarantees of academic freedom. These constitutional provisions provide the overarching legal framework within which educational laws are developed.

The 1996 *Constitution of the Republic of South Africa* safeguards the right to education while promoting equality and non-discrimination (Republic of South Africa, 1996). Particularly, Section 29 underscores the significance of basic as well as higher education, mandating the state to gradually fulfil this right. Moreover, it explicitly prohibits any unjust bias and upholds the principles of fairness and social justice within the educational realm. The *Constitution of Zimbabwe*, adopted in 2013, recognises the right to education and prohibits discrimination (Government of Zimbabwe, 2013). Section 75 of the Constitution guarantees the right to education at all levels and emphasises the state’s responsibility to provide accessible and quality education. It also encourages educational equality and non-discrimination. The *Republic of Namibia’s 1990 Constitution* emphasizes the significance of education as well as the ideals of equality and non-discrimination (Government of Namibia, 1990). Article 20 of the Constitution protects the right to education and emphasizes the responsibility of the state to offer free elementary education and increase access to higher education. It also supports social justice and equality of opportunity in education. The *Republic of Botswana’s 1966 Constitution* enshrines the basic right to education and expressly forbids any kind of discrimination (Government of Botswana, 1966). Section 18 of the Constitution is critical since it not only protects the right to education but also highlights the state's commitment to offer equal educational opportunities for all people. These constitutional articles serve as crucial legal frameworks that regulate educational legislation in Botswana by preserving ideals of fairness, non-discrimination, and social justice (Mlachila & Moeletsi, 2019).

**International Conventions and Declarations**

International treaties, such as the *Universal Declaration of Human Rights* (UDHR) and the *International Covenant on Economic, Social and Cultural Rights*, clearly define education as a basic human right. These accords, enacted by the United Nations General Assembly in 1948, establish global standards and norms that impact educational policies at the national and...
regional levels. The UDHR, in particular, underscores the significance of include education in the larger scope of human rights (United Nations, 1948). Article 26 of the Universal Declaration of Human Rights expressly states that everyone has the right to an education that is aimed toward the full development of the individual's potential as well as the promotion of understanding, tolerance, and goodwill among all countries This declaration highlights the importance of education in fostering social justice, equity, and academic freedom. The *International Covenant on Economic, Social, and Cultural Rights* (ICESCR), adopted by the United Nations General Assembly in 1966, acknowledges education as a fundamental human right and requires state parties to guarantee equal access to education (United Nations, 1966). Article 13 of the International Covenant of Economic, Social, and Cultural Rights recognizes the right to education, which should endeavour to develop an individual's personality, talents, and capacities. Education is a fundamental right that should be available to all people without prejudice. Its influence extends beyond human development to economic, societal, and cultural dimensions. Aubry and Dorsi's (2019) covenant are a useful instrument for assessing the equity and social justice implications of educational policy.

**National Legislation and Institutional Frameworks**

Countries' higher education policies differ, impacting institutional legal frameworks and administrative systems. These laws address issues such as student and teacher/faculty rights, accreditation, finance, quality assurance and academic standards. The *Higher Education Act of 1997* (South Africa, 1997), for example, serves as the foundation for the country's higher education system in the South African Republic. Together with education rules and institution-specific policies, these laws form the worldwide legislative framework for higher education. The Act under examination here is critical in determining the impact of techno-rationalism on educational policy in South African institutions. It is crucial in addressing concerns of justice, social fairness and academic freedom in South Africa's higher education system. Similarly, *Zimbabwe's Education Act of 1987* plays an important role in governing the educational environment, notably in higher education. It creates a comprehensive legislative framework for the education sector's expansion, regulation, and general development. It defines the authorities and functions of the National Council for Higher Education, the regulatory organization in charge of higher education institution quality assurance and accreditation. Because it covers problems such as equality, access, and academic standards in Namibian institutions, this act is crucial to investigating the influence of techno-rationalism on educational legislation.

**Institutional Policies and Guidelines**

Universities also create their own rules and guidelines to guarantee compliance with national laws and regulations and to handle special difficulties in their respective settings. Academic freedom, student rights and duties, research ethics, intellectual property, data protection, and online learning are some of the topics covered by these regulations. For example, the University of Cape Town in South African has an *Academic Freedom Policy* (UCT, 2016) which upholds the
ideals of academic freedom and freedom of expression at the university. It guarantees that students and academic staff have the freedom to express themselves and engage in critical thinking without fear of repercussions. This policy is directly important to investigating the influence of techno-rationalism on academic freedom at Southern African institutions since it establishes criteria for safeguarding intellectual freedom and supporting varied viewpoints.

Another example is the *University of Zimbabwe’s Research Ethics Policy* (UZ, 2013) which describes the ethical principles and criteria for doing research at the university. It tackles concerns such as informed consent, confidentiality, integrity, and appropriate research practices. This policy is relevant to understanding the consequences of techno-rationalism on research ethics within the university system, ensuring that ethical issues are respected in the context of expanding technical and data-driven methodologies. The University of Namibia, meanwhile, has an *Online Learning Policy* (UNAM, 2014) which provides principles and criteria for online education delivery within the university. It covers topics including course design, student assistance, evaluation, and data privacy. This policy is significant to investigating the influence of techno-rationalism on educational legislation, specifically in connection to online learning and guaranteeing fair access and quality education in the digital era (Baldwin, Raven & Webber-Jones, 2022).

Techno-rationalism in higher education has far-reaching ramifications for educational legislation, notably in the setting of institutions in Southern Africa. As digital technology and data-driven practices grow more prevalent in educational institutions, it is critical to analyse how existing legal frameworks manage the difficulties and possibilities posed by the new technology (Meyers & Smith, 2020). The interaction between techno-rationalism with privacy and data protection regulations is one critical element that requires consideration. Universities must maintain compliance with current data protection rules and establish steps to protect the privacy and rights of students, faculty members and other stakeholders in an era where huge volumes of data are gathered and analysed (Anderson, 2019). The rise of digital technologies, AI (artificial intelligence) and online platforms poses major questions about intellectual property rights. Educational legislation must establish clear instructions on intellectual property ownership, usage and protection in the digital domain, particularly in regard to online learning, open educational resources and digital content production (Swan, 2018). Another critical component of educational legislation that must be addressed is the preservation of academic freedom. Techno-rationalism should not unnecessarily limit university autonomy and freedom of inquiry, teaching and research. Legal frameworks must maintain academic institutions’ autonomy while also ensuring that technology advances do not threaten core concepts of academic freedom (Peters, 2020). Furthermore, in the digital age, educational legislation must address concerns of fairness and access. As universities implement digital technology, it is critical to bridge the digital divide and offer equal access to educational opportunities for all. Legal frameworks should encourage inclusive practices that accommodate varied learners and
allow for equal participation in digital education, therefore addressing the digital gap and fostering educational equity (Kwiek, 2019).

Legal frameworks regulating higher education, such as constitutions and international treaties such as the *Universal Declaration of Human Rights* (United Nations, 1948), often emphasises the need of equal access to education. Article 26 of the *Universal Declaration of Human Rights*, for example, declares that everyone has the right to an education. These frameworks can guide policies and actions aimed at providing equal chances for marginalised and disadvantaged groups and serve as a foundation for guaranteeing equal opportunities in education (Smith, 2018).

When it comes to social justice and inclusive practices, the legal framework should encourage inclusive practices in higher education that address structural imbalances and promote social justice. The South African Constitution, for example, offers a legislative framework that promotes educational institutions to establish inclusive policies and practices via its commitment to social justice and equality (Republic of South Africa, 1996). Incorporating social justice concepts into curriculum creation, supporting inclusive pedagogies, and ensuring that digital technologies are used in ways that benefit marginalized groups are all examples of policies that may be implemented (Aguilar, 2019).

Notwithstanding, academic freedom and the challenges of the digital age should be an era where educational regulations must protect intellectual independence. Academic freedom is a basic principle that permits academics and students to investigate ideas, engage in open debate, and question dominant beliefs. Legal frameworks should include procedures for dealing with difficulties such as censorship, surveillance and undue influence that may occur in the context of techno-rationalism (UNESCO, 1997). The *American Association of University Professor’s Statement* on Academic Freedom, for example, emphasizes the significance of maintaining academic freedom in order to promote the pursuit of knowledge and truth (AAUP, 1940).

Techno-rationalism's consequences for educational legislation in the digital age are far-reaching. The legal frameworks that regulate higher education, such as international agreements and national constitutions, are critical to guaranteeing equitable access, fostering social justice, and protecting academic freedom. Educational laws can provide a solid foundation for universities to navigate the complexities of the digital era and fulfil their mission of providing quality education for all by upholding these principles and adapting to the challenges and opportunities presented by technological advancements (Fabriz et al., 2021).

**Emancipatory Possibilities for the University**

Emancipatory possibilities for universities could emerge from critically assessing and criticising prevalent analytics and developmental tropes within higher education. This involves questioning the dominant paradigms of knowledge production, evaluation and assessment that may reinforce oppressive systems and hinder transformative change (Connell, 2019). By
interrogating these analytics and tropes, universities can identify and eliminate barriers to emancipation, fostering a more inclusive and socially just learning environment.

To embrace emancipatory possibilities, universities must advance a transformative and inclusive vision that transcends traditional boundaries and promotes social change. This vision entails reimagining the purpose and role of higher education in society, shifting towards a more participatory and community-engaged approach (Freire, 1970). By fostering critical thinking, empowering marginalised voices and engaging in collaborative problem solving, universities can cultivate environments that prioritise equity, justice, and liberation (Sultana, 2019).

Emancipatory possibilities within the university 'in the present' can be further enhanced by integrating interdisciplinary perspectives and knowledge systems. This involves breaking down silos and embracing diverse ways of knowing, including indigenous knowledge, feminist perspectives, and decolonial frameworks (Tuhiwai Smith, 2012). By recognising and valuing different forms of knowledge, universities can enrich their curricula, research agendas, and pedagogical approaches, leading to a more holistic and comprehensive understanding of the world and its complexities (Darling-Hammond, Flook, Cook-Harvey, Barron & Osher, 2020).

By critically examining the prevailing analytics and developmental tropes, advancing a transformative and inclusive vision, and integrating interdisciplinary perspectives, universities can explore and foster emancipatory possibilities in the present. These efforts are essential to create a university environment that promotes social justice, inclusion, and transformative learning experiences (Capper, 2018).

CONCLUSION

Throughout this exploration, we have delved into various dimensions shaping the de/recomposition of the university in Southern Africa. We examined the emergence of technorationalism and its impact on higher education, the interplay of technological, economic, affective, and sociocultural forces, the implications for social justice aspirations and praxes, the integration of neoliberal practises within university management, the implications of educational law in the digital era, and the emancipatory possibilities for the university 'in the present.' These investigations have shed light on the complex dynamics at play and provided insights into the challenges and opportunities facing universities in Southern Africa.

The findings discussed in this study have significant implications for the de/recomposition of the university in southern Africa. They highlight the need to critically assess the influence of technorationalism and neoliberal practises, while safeguarding social justice aspirations, academic freedom, and equity in higher education. The theory of critical pedagogy helped challenge learning environments such as higher education institutions where people might be politically, socially, and economically empowered or disempowered.

These insights call for a reimagining of university management approaches, policy frameworks, and educational practices to ensure that the evolving landscape aligns with the
region's unique sociocultural context and promotes inclusive and transformative learning environments.

**Recommendations**

- Conducting in-depth studies on the specific impact of techno-rationalism on marginalised groups and social justice initiatives within the university context in Southern Africa. This includes, investigating the potential of educational laws and policies in Southern Africa to respond to the challenges of the digital era, particularly regarding privacy, data protection, intellectual property and academic freedom.

- Examining the long-term effects of decomposition/recomposition at university level on broader society, including its impact on economic development, social cohesion and democratic participation. Consequently, it will foster interdisciplinary collaborations and knowledge exchange platforms to encourage dialogue and sharing of best practices related to university decomposition/recomposition discourse.

By following these recommendations, Southern African universities can proactively address the challenges and harness the opportunities presented by the decomposition/recomposition of the university, ultimately working towards a more equitable, socially just and transformative higher education landscape.

In conclusion, this study has provided valuable information on the complex dynamics of techno-rationalism at Southern African universities. By critically examining these issues, identifying their implications and recommending future research and action, it is our belief that we can work toward building a university environment that fosters social justice, equitable educational opportunities, and transformative learning experiences.

**REFERENCES**

AAUP. (1940). *Statement of principles on academic freedom and tenure*. American Association of University Professors.


Johnson, L. (2016). Emancipatory Possibilities for the University 'In the Present'. *Journal of Critical Education Policy Studies, 14*(1), 56-73. [https://doi.org/10.33524/cjep.v14i1.331](https://doi.org/10.33524/cjep.v14i1.331)


D. Léon, & R. Sukhnandan (Eds.), *International handbook of comparative education* (pp. 809-826). Springer


Swan, K. (2018). Open educational resources. In The SAGE encyclopedia of educational research, measurement, and evaluation (pp. 1316-1321). SAGE.


Williams, B. (2018). Gender and political leadership in a time of COVID. *Politics & Gender, 16*(4), 943-950. [https://doi.org/10.1017/S17439223X2000029X](https://doi.org/10.1017/S17439223X2000029X)

