FOCUS ON METHODOLOGY

Designing for justice: How universal design theory could bolster health professional education research

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Abstract

Universal design theory (UDT), emerging from the field of architecture and infused with the politics of the disability rights movement, refers to a way of planning for and responding to diversity that can be harnessed for research design. We argue that UDT is a critical tool for researchers in health professional education (HPE) to realise their obligations for social accountability, justice, equity, diversity and inclusion in HPE. This paper introduces researchers to UDT and demonstrates how it could inform research design in HPE. We provide an in-depth, socio-political explanation of the theory and why it is important for HPE research, and we elucidate ways it can inform HPE research design and process—including the tensions that may arise in activating these principles alongside some research paradigms and conditions of the field. We seek to highlight the potential of universal design to transform research practice to advance justice.

Keywords: qualitative research; equity; justice; research design; universal design; disability studies; health professional education

Introduction

> *A new registrar receives an email invitation to participate in a study about the implementation of competency-based assessment. The registrar is excited. They have opinions and ideas about this form of assessment and its implementation. They notice that the call for participants specifies that all participants will need to be available for a 1-hour in-person individual interview between 9 am and 6 pm. Furthermore, participants will not receive compensation for their time and no information is provided about the physical accessibility of the interview site or the availability of sign language interpreters. Attached to the email is a demographic survey asking participants to specify if they are male or female. The survey also fails to include names of local Indigenous groups under ethnicity options. The registrar sighs and deletes the email thinking, "I already have enough on my plate."*

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Consider:

- Why might this registrar have decided not to participate?
- Who did you imagine the registrar to be initially? After reading the full scenario?
- Who does the call for participants imagine their prospective participants are? How does the call for participants convey this?

Scholars have critiqued the field of health professional education (HPE) research for building knowledge that is exclusionary (Naidu, 2021; Wyatt, 2022). This problem has been linked to the reliance on research designs and practices calcified in certain ways of being, knowing and doing that reflect a long tail of historical power structures (Naidu, 2021; Wyatt, 2022). This tradition has implications; HPE research practices are implicated in upholding and reproducing structures of racism, hetero/cis/sexism, ableism and colonialism. While HPE scholars have offered strategies to redress research injustices (see, e.g., Karani et al., 2017; Zaidi et al., 2021), an overall theory to guide research design and practice towards justice remains elusive. In this paper, we argue that universal design theory (UDT) fills this gap by providing an orienting methodological theory that pushes researchers towards expansive design thinking to create maximally inclusive research.

What is universal design theory?

Originally conceived by disabled US architect Ronald Mace, universal design is defined as "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaption or specialised design" (Center for Universal Design, 1997, para. 6). When expanded to a theory, universal design invites a way of looking at designs (e.g., research study design, architectural design, motor vehicle design) to uncover the assumed target audience. It can act as a method for reorienting design practice towards maximal inclusivity to create environments and practices that include the broadest possible diversity of population from the outset. While early UDT was applied to physical spaces and objects, the concept has since travelled to inform the design of less concrete objects, such as educational practices, services and conferences (Burgstahler, 2021; CAST, 2018; McGuire & Scott, 2006). The original UDT ethos, conceived by Mace and colleagues, continues to guide universal design efforts today.

UDT challenges us to reject the common assumption that an objective, decontextualised perspective on reality exists. It encourages us to move beyond such a zero-point epistemology, or a view from nowhere (Haraway, 1988; Paton et al., 2020), to recognise that design practices are always already informed by situated knowledge. Every time we engage in design (be it for HPE research or for architecture), we make assumptions about who will interact with the object. Hamraie (2013) argues that many design practices are *value-implicit*, meaning that designers generally do not seek to exclude people, but their unrecognised assumptions about who will (and who will not) use the object are embedded within the object's form and function. These implicit ideas often

follow dominant conceptions of normalcy. Defined by Garland-Thomson (1997) as *the normate*, this conceptualisation of normalcy assumes a naturalised human figure that is generic (i.e., unnamed and obscured) that serves as the template for many design practices (Hamraie, 2012). Generally, the normate template is a white, cis, heterosexual, Christian, upper-middle class, non-disabled, adult man, though variations on the notion of who is normally expected may arise in context (consider, for example, a playground for which the normate template is a smaller version of the template). Implicit assumptions of who will use or interact with the object thus underpins the development of designs that exclude (e.g., a playground inaccessible to children using wheelchairs).

UDT asserts a *value-explicit* design approach that transforms who is considered to be the normal and expected user of the designed object (Hamraie, 2013). Rather than leaving design practices unexamined and unnamed, UDT requires practitioners to critically consider for whom the object is being designed and to shift their design practices to expand the object's usability by a broader array of bodyminds[1]. This approach represents a radical shift in thinking about who objects, places, services and practices are for. It seeks to illuminate who has been historically excluded from participation and to expand inclusive participation possibilities. UDT challenges us to deliberately design spaces, places and practices—including research practices—that begin with the assumption that people previously excluded by the *normate template* are to be included and that we value their ways of being, knowing and doing (Baglieri, 2020; Jaarsma, 2016). In Mace's (1985) early articulation of UDT, he sought to remove "the 'special' label from products and designs for people with mobility problems, and at the same time, eliminate the institutional appearance of many current accessible designs" (p. 147). The ethos communicated through this approach desegregates access, bringing disabled people's ways of being and doing into the everyday. Furthermore, by designing for everyone, encompassing those with disability, inclusion practice moves away from costly, clunky and laborious retrofit access efforts that often result in paradoxical othering (Dolmage, 2017).

UDT acts as a form of resistance to a world that was built to exclude disabled people. While some may argue exclusion was historically implicit, driven by assumptions that disabled people could not exist in public life, some designs and practices also explicitly excluded disabled people from public spheres (Schweik, 2009). Such explicit exclusion arose from a eugenic logic (Schweik, 2009). Regardless of whether exclusion was implicit or explicit, Mace (1985) argues the effect was the generation of a vicious cycle: exclusionary assumptions justified and reproduced further exclusion, which continuously designed disabled people out of society. UDT seeks to halt this exclusionary cycle. It asserts that disabled people belong in all areas of society, and it contends that disabled embodiments must, therefore, inform the very premises from which we engage in all forms of design activities.

[1] The term *bodymind* is used instead of body/mind or body and mind to assert the interconnection of the two and the importance of considering cognition and mental health in our conception of embodiment (Price, 2015).

Although disabled people catalysed the development of UDT, even from the earliest stages, Mace (1985) recognised that designing from disabled people's embodiments is a concern interconnected with those of other marginalised people, including children, women, elderly people, those with low income and people of different sizes (Hamraie, 2016). The ways of thinking prompted through UDT can extend beyond disability to consider other forms of user difference. In the theory's call to imagine the broad universe of people who will use the object under design (Burgstahler, 2013), there is an imperative to think intersectionally and across equity-denied groups, including and beyond disabled people. UDT demands that we critically reflect on who is unimagined, who is excluded. These reflections invoke contemplation of historical injustices that ripple into the present. In other words, UDT can be wielded as a tool for expanding our notions of diversity and for advancing justice.

Why UDT should be used in HPE research

While HPE policies, practices and rhetoric have shifted towards the promotion of justice, equity, diversity and inclusion (JEDI), current research demonstrates that even when students and professionals from not-overrepresented backgrounds are present in HPE, they remain marginalised by current conditions (Beagan et al., 2022; Bullock et al., 2020; Butler et al., 2019; Davis & Came, 2022; Meeks & Jain, 2018; Southgate et al., 2017). Disabled HPE students, for example, continue to encounter teaching and learning practices that assume specific ways of being, knowing and doing that load additional labour for their participation (Jain, 2022). This work concluded that an imperative of *capability* is deeply embedded in practices in medical education, perpetuating a cultural logic of "compulsory hyper-ablebodiedness and mindedness" (Jain, 2022, p. 7). Problematically, HPE research tends to treat such knowledge as a niche concern. That is, research that excavates how students from varied backgrounds navigate HPE appears almost exclusively in research focused on those students' experiences—within a special interest area of "JEDI research." Outside of JEDI research, much HPE research treats student and teacher positionality as inconsequential to the research topics being addressed in a given study. HPE's research participants are described as a largely homogeneous population—the *normate template* dominates. This assumption of uniformity within HPE fails to unearth nuance in how the unique individuals in that population experience and act in relation to phenomena under study (Frost & Regehr, 2013; Volpe et al., 2019; Wyatt et al., 2021). We need only look at a conference program to see the *normate template* in action; matters of racism, ableism and colonisation remain tucked away in special-interest JEDI-focused program tracks, while other sessions proceed as if exclusionary forces were not also at play.

Why do we need to harness UDT in HPE research? Because the *normate* is not normal. Because assumptions of homogeneity and neutrality build HPE practices that fail to embrace the increasingly diverse population of HPE. Because if we do not, we are responsible for perpetuating cycles of exclusion and oppression.

UDT prompts a shift in HPE research practices that can break the dangerous cycles that have traditionally persisted. Speaking broadly, UDT asks researchers to deliberately build plans and practices that anticipate an expansive universe of HPE community members from the outset of a research project. It asks researchers to be agile, to continually revise their research approaches towards ever greater inclusivity. UDT invites us to interrogate the *normate* assumptions that are present in our HPE environments. In a research context, such a process would prime researchers to critically consider who is part of the HPE community. Leaning into diversity from the outset by using UDT would prompt researchers to think beyond the *normate template* of HPE learner and teacher. Assuming that our HPE community is comprised of multiple genders, ethnicities, body types and sizes, modes of cognition, ways of moving, financial stressors, care responsibilities, epistemologies and ontologies (for example) would drive us to design our research projects to work in anticipation of these differing ways of knowing, being and doing. Such practice would make research more accessible to a more diverse group of people, better reflecting today's HPE community. It could also spark curiosity about how those differing positionalities might come to bear in, for example, assessment, professionalism or simulation contexts.

How to implement UDT in HPE research

Exactly how to execute UDT is a contested issue. Scholars have created UDT guidelines appropriate for specific applications, each reflecting the context and politics underpinning each application's interpretation of UDT (Center for Universal Design, 1997; CAST, 2018; Scott et al., 2001; Williams & Moore, 2011). In Table 1, we present UDT principles from the worlds of the design of physical objects (original principles), universal design for learning and universal design for research. Williams and Moore's (2011) "simple rules" for universal design for research (see Table 1) reflect the authors' grounding in biomedical research and a positivist paradigm. It also appears focused solely upon advancing disability inclusion. In our description of how to use UDT for HPE research design, we seek to build from the principles in Table 1 while also pushing them forward in a manner appropriate to the HPE context and political aims.

HPE researchers might use UDT as a theory to analyse (a) the HPE practices that are the objects of study, (b) existing HPE research and (c) as a tool to guide HPE research design. UDT can serve as a theoretical framework, guiding design and analysis (Varpio et al., 2020). Such applications would advance justice in HPE research by critically examining the way current arrangements include and exclude specific populations. In Table 2, we offer reflective questions that HPE researchers might employ when implementing UDT in any of their research efforts.

Table 1

Universal Design Principles

Original Principles[1]	Universal Design for Learning[2]	Universal Design for Research[3]
1. *Equitable use*—The design is useful and marketable to people with diverse abilities. 2. *Flexibility in use*—The design accommodates a wide range of individual preferences and abilities. 3. *Simple and intuitive use*—Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills or current concentration level. 4. *Tolerance for error*—The design minimises hazards and the adverse consequences of accidental or unintended actions. 5. *Low physical effort*—The design can be used efficiently and comfortably and with a minimum of fatigue. 6. *Size and space for approach and use*—Appropriate size and space is provided for approach, reach, manipulation and use regardless of user's body size, posture or mobility.	1. *Multiple means of representation*—Give learners various ways of acquiring information and knowledge. 2. *Multiple means of expression*—Provide learners with alternatives for demonstrating what they know. 3. *Multiple means of engagement*—Tap into learners' interests, offer appropriate challenges and increase motivation.	1. Plan your research to include all potential participants who meet the inclusion criteria, regardless of their current abilities or disabilities. 2. Do not create exclusion criteria unless there is a compelling scientific rationale. 3. Provide multisensory, flexible options for recruitment, research instruments … , measurements, and responses from participants, with reasonable accommodations that invite and facilitate participation by persons with disabilities. 4. When you do not know how to include someone with a disability, consult someone who does.

[1] Center for Universal Design, 1997, p. 1

[2] Based on CAST, 2018, as interpreted by Dolmage, 2017, p. 145

[3] Williams & Moore, 2011, p. 3

Analysing HPE practices

As a theory to analyse practice, researchers could use UDT concepts to examine an HPE program, process, space, policy or combination thereof. Researchers would begin by recognising that specific values and assumptions are baked into the way these objects are designed and put into action. Analysis would seek to reveal those values and assumptions. Methodologies for that analysis might include discourse or semiotic analyses (Barthes, 2000; Foucault, 2013; Hall, 1997; Titchkosky, 2007; Weedon, 1987), since they treat the program, process, space or policy as a text to be read and critiqued. For example, a study could examine an OSCE (objective structured clinical examination) by asking how inclusive is the exam design? Objects of analysis for that study could include: the physical space of the exam administration, the scheduling process, the temporal structure of the exam, the exam scenarios, the feedback structure, the assessment forms and the associated policies relating to OSCEs.

Table 2

Reflective Questions for HPE Researchers

Who is part of this community?	Who have we assumed HPE includes?
	Who is missing from our assumptions? From our participant group?
	How do we know who is missing?
	Where are they already?
How can we best access their perspectives?	How do they know (i.e., what is their epistemology)?
	How do they express themselves?
	When is a good time to reach them?
	How do they communicate?
	Where will they be comfortable?
How do we share what we have come to understand?	Who needs this information?
	How might the information be presented given these audiences?
How have we taken all of this into account in our research design?	
How have we taken this into account in our research team's makeup and functioning?	
How will we remain nimble in our inquiry?	How have we planned to remain alert for the need to shift practice?
	How have we built in mechanisms for feedback on design and practice?
	How have we planned for maximal flexibility in design from the outset?

Each object individually and then collectively would be analysed to answer a series of questions: Who are the expected users—in terms of learners, assessors, standardised patients and administrators? Who remains unexpected? What are the implications of these expectations? Researchers might consider the different roles in the exam process (e.g., student, standardised patient, examiner, administrator) and seek to understand how the current design constructs each role. Researchers could engage with the people in these roles and who interact with object(s) under study to ask how they experience the OSCE, how they navigate its use and how they build workarounds when design flexibility does not exist. Again, researchers would seek to understand the associated implications of these experiences related to the object design. Researchers might work with participants to identify barriers and opportunities to redesign the OSCE in line with UDT.

Analysing HPE research

As a theory to analyse HPE research, UDT could be used to critique the design of published research and identify practice or knowledge gaps that result. Such a project

could look at the corpus of research in an area and apply UDT principles to guide analysis. In this analysis, we are seeking to understand who is imagined as a participant in the HPE community. For example, we might study OSCE assessment literature to analyse who is portrayed as an HPE learner and as an HPE assessor. Analysis might explore, for example, the types of questions asked in the published studies, the participant groups represented in the existing literature, methods used therein as well as absences in each. The analysis would seek to identify how the assumptions embedded in aspects of research design both enable and constrain who can be recognised as an HPE learner or assessor in the existing OSCE literature. The analysis would also consider how these assumptions and recognitions shape the knowledge base and who has been silenced or side-lined therein. Analysing the HPE literature through UDT would provide insights into how future HPE research needs to be modified to broaden participation of the entire community of members, not just those who embody the *normate*.

Guiding HPE research design

UDT could inform HPE research by catalysing design decisions that embed access to expand research participation and engagement. At its heart, UDT asks us to expect a rich diversity of people to be a part of our work. This requires our foundational research planning to operate with the expectation that people with different needs and backgrounds will be a part of our research team, will comprise our research participants and will interact with the products of our research.

To do that, HPE researchers could deliberately consider who is most likely marginalised in the phenomenon under study and use this information to guide practices to deliberately include them in the study. For example, if the HPE researcher is designing a study about OSCE assessments and wants to ensure their research is inclusive, the research might begin by analysing the existing literature about OSCE assessments to identify how HPE research has marginalised some populations through this body of literature. Then, with this information in hand, the researcher could engage in consultative conversations with scholars, learners, faculty and administrators to learn about populations, considerations and areas not yet addressed by research into OSCE assessment. Through these dialogues, the researcher can now begin to design a study that aims to broaden inclusivity in OSCE assessment research by building research design practices that will welcome those currently marginalised in OSCE assessments design as participants and co-researchers and seek to expand their understanding of these experiences within the gestalt of the research.

All aspects of HPE study design informed by UDT should seek to build modes of participation that take into consideration different needs and preferences. The UDL "multiple means" principles (see Table 1) can guide researchers to build multiple means of representation, expression and engagement into their study (CAST, 2018; Dolmage, 2017). These principles could also inform how the research team works together,

including the research tools used. For example: Is SPSS or NVIVO the only tool through which data analysis and coding will occur? What if they are not accessible to a team member with a visual impairment? If a cloud-based platform is preferred, how will this be accessible to someone without unlimited internet access? Perhaps team members could choose from an array of coding modes (e.g., Excel, paper-based, Quirkos) with a workflow process for consolidating analyses. Such plans might be discussed as a team, beginning from a place of genuine openness and expectation that one approach will not work best for everyone. A similar approach could inform all aspects of how the team works, such as planning how, when and where you will meet. Such alternatives could be the very thing that enables a financially strapped study or a Deaf collaborator or a remote data analyst to fully participate in the research.

Another UDT principle for HPE researchers to harness targets recruitment, asking if the study can be designed for flexible participation that assumes diverse bodyminds. Since UDT seeks to undermine the assumptions of the *normate* participant, HPE investigations using this perspective require researchers to ask how *every unique person* could be encouraged to participate in the study. For example, recruitment advertisements can specify that researchers are seeking diverse perspectives on the topic and, while they have designed their project with access and inclusion in mind, they would like to know how *else* they could support participation. Such a description would also include information about the types of access features already planned for (e.g., the accessibility of the focus group site, availability of parking, all-gender and wheelchair accessible restrooms, childcare, refreshments and renumeration rates). This type of detail communicates what the researchers have considered so far, demonstrating openness to ensuring access. This attention to recruitment also helps the HPE researcher to consider how UDT can inform overall recruitment strategies. This might lead a research team to consult with existing networks of, for example, disabled doctors and Indigenous medical students to learn more about appropriate avenues and mechanisms for recruitment and to partner with them to reach members. Taking UDT as an active stance, the team could continually review the recruitment process to ask: Who is here? Who is missing? These questions prompt reflection on how the research will be constructed and the associated implications for the knowledge created to consider additional actions.

Data generation following UDT might also offer flexible modes of elicitation for participants. That could look like offering choices of face-to-face, online, camera optional, chat-based and asynchronous participation (Price & Kerschbaum, 2016). Participants might have options for sharing their perspectives in a variety of formats, including a go-along or static interview (Castrodale, 2018), a participant-generated audio, video or written narrative responding to prompts. The goal of offering such options is to assume that a singular mode of generating data will not work for all possible participants. Flexible elicitation might also take temporality into consideration, remaining ready to offer participants more time to communicate, giving participants choices in the length and

time of interview that suits their time constraints and attention span. Plans might offer the possibility for multiple sessions to complete an interview. Offering flexible choices and being open to alternatives allows participants to identify the mode of participation that best aligns with their communication style, comfort and schedule, aiming to generate the richest data from their perspective.

This inclusive approach to research is not inexpensive. HPE researchers will need to consider how to budget for deliberate inclusion. Securing financial supports that can pay for accommodations for individualised adjustments to practice (e.g., sign language interpreters, captioning videos or meetings, audio description) are expenses that are often incurred when bringing UDT into research. Other UDT considerations that require financial support include, for example, scaling the payment of research assistants to the living wage to ensure just compensation is not a barrier for students to join the team, renumerating participants in a way that recognises time given to research is often in short supply for equity-denied people (Jain, 2022; Wyatt et al., 2023), ensuring knowledge translation products and activities are fully accessible (e.g., open-access publications, captions for audio material and audio description for visual materials, and language translation depending on anticipated audiences) and translating research findings into multiple formats (e.g., audio, visual, plain language, policy briefs) and in multiple venues in recognition that your target audiences will respond to a variety of information delivery modes.

Possible tensions

We recognise that the guidance we offer for using UDT to maximise inclusivity in HPE research is not without its downsides. Perhaps chief among these is the financial resources required to conduct UDT-informed research. HPE is notoriously underfunded (Archer et al., 2015; Todres et al., 2007). Shoestring budgets are the norm we all largely contend with (McKechnie et al., 2023). And yet, we argue that diversifying the population of individuals who can participate in HPE research, as creators and subjects, is foundational to the success of the HPE mandate. Scholars are increasingly reporting the importance of social accountability as part of the mission underpinning the education of future health professionals (Aibana et al., 2019; Barber et al., 2020; Phillips et al. 2022). If we are to fulfil this social contract, we must take active steps to recognise that our HPE research efforts are part of the mechanisms that perpetuate a *normate template*, which excludes large swaths of the population from being part of the health professional community. Therefore, while we acknowledge that there are limited funds available for HPE research, we would encourage the community to divert those precious resources towards implementing UDT. It is only by so doing that we can truly engage in embracing *all people* into the HPE community.

We also acknowledge that the diversity of recruitment and data generation approaches we advocate for in this paper can pose practical impediments for HPE research. Many

of HPE's expectations around rigorous research stem from a post-positivist paradigmatic orientation (Young & Ryan, 2020), which expects (or even insists upon) homogeneity across all recruitment and data generation approaches. However, such uniformity is part of the ways in which *normate* expectations are upheld. The markers of rigour for research are not so strict as to inhibit diversity in terms of recruitment and data generation, instead it will require savvy and agile research designs that find ways of achieving replicability, generalisability and consistency in studies that also simultaneously encourage and enable a full diversity of participation. In other words, we suggest that using UDT is indeed possible in all HPE research, even as it is neither simple nor straightforward.

Another critique that has been levied against UDT is that it aims to achieve a level of inclusivity that is unattainable (or if it is attainable, it is unsustainable). Several universal design proponents have acknowledged that complete elimination of the need for individualised adjustments is most likely impossible (Burgstahler & Cory, 2008; Scott et al., 2003). Others warn that even when UDT is incorporated in all aspects of a research study, there will still be populations who are excluded (Withers, 2012). In response to these concerns, we join the chorus of UDT scholars who conceptualise UDT as an active process that is forever incomplete. We recognise that it is impossible to anticipate all of the ways that particular populations are marginalised, however that simply means that we must continually renew our efforts to plan for and intentionally build UDT into our research designs to avoid further marginalisation (Burgstahler & Cory, 2008; Scott et al., 2003). Taking this line of thinking further, Dolmage (2005, 2017) asserts that we should think of UDT as practice rather than a procedural exercise framed by checklists—a verb rather than a noun. Understanding UDT as an active orientation encourages a continual process of review and revision, wherein the endpoint becomes a moving horizon rather than a fixed destination (Dolmage, 2005). Jaarsma (2016) conceives of this as playful territory creation, wherein flexibility is an "ethos of practice" (p. 208). By resisting finality in our research processes, we remain nimble—ever alert to what we may not have considered, ready and willing to learn, shifting our practice accordingly.

Conclusion

HPE has long acknowledged the need to honour an implicit social contract to "foster physicians who are conscious of social determinants of health, social inequality, and social dynamics in health care" (Manca et al., 2020, p. 958). And yet, despite this recognition, the field has struggled to engage in maximally inclusive research practices. We propose that UDT can be usefully harnessed as an orienting methodological theory that can help HPE researchers engage in expansive design thinking to create research that truly embraces, legitimises and enacts diversity. While originally developed to counteract ableist assumptions in architecture, UDT has evolved into a theory that offers inclusivity-enhancing principles for research. The description we offer of how UDT can inform HPE research takes criticality seriously; it asks HPE researchers to consider intersecting and interdependent forces of ableism, racism, colonisation, cis/hetero/sexism and classism

that undermine attempts towards inclusivity. This type of work requires engagement with people most affected by these forces of exclusion as co-designers and consultants to deliberately expand the notion of universal being used (Hamraie, 2013, 2016, 2017; Sins Invalid, 2019). By critically, constantly, intentionally and collaboratively constructing what universal means and evaluating how we have realised it through our work, we propose that the HPE community can reckon with power structures and foreground difference as an expected state rather than neutralising it.

Conflicts of interest and funding

The authors declare no conflicts of interest or funding.

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