Chapter 23

Narrative Choreographies

DOHaD, Social Justice, and Health Equity

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Communicating research findings is a storytelling practice. The stories we tell as researchers are important to how publics understand research findings and how research circulates in society. This is especially true for fields that have important social, political, or policy implications, such as the Developmental Origins of Health and Disease (DOHaD). In its emphasis on gestation and early childhood, DOHaD research often focuses on the behaviours of parents (especially mothers) as crucial to the development and health of their children. Depending on how the story is told, this can lead to blaming mothers for future diseases [1]; however, this is not the only possibility. If we zoom out and focus the narrative not on the individual, but on the larger social, economic, and political environment, it is also possible to use DOHaD research to problematise the structural conditions that shape health across generations [2, 3]. In this case, the upstream social determinants of health such as wealth inequality, economic exploitation, sexism, and systemic racism become targets for public health intervention. The stories we tell about the research matter to how research questions are framed, how studies are conducted, how findings are interpreted, and what kinds of interventions are proposed. Thus, it is important to understand storytelling as crucial to the practice of doing responsible research at the science–society interface.

We use the term 'narrative choreographies' [4] to capture the way researchers, clinicians, science journalists, and other actors conceptualize and embed DOHaD knowledge claims as part of larger scientific, social, and political narratives. Sometimes narrative choreographies are strategic, where we deliberately choose language to encourage certain interpretations of research findings and discourage others; however, more often than not we employ narrative choreographies unconsciously, using scientific and cultural narratives that are available to us in our wider social environment – which can have unintended consequences. For example, DOHaD narratives are often focused on the effects of maternal obesity[1] and gestational diabetes on fetal development. Feminist science studies scholar Sarah Richardson argues that this narrative focus can lead to self-rapprochement in mothers who have a BMI classified as 'obese' and a lower standard of

Ruth Müller's work on epigenetics and DOHaD has been supported by the German Research Foundation DFG through the project grant "Situating Environmental Epigenetics" (403161875; PI: Ruth Müller). Ruth Müller's and Martha's Kenney's work on this chapter has further been supported by a collaborative research residence fellowship at the Brocher Foundation in Hermance, Switzerland, in 2022. Please see their website for information on their mission and programs: https://www.brocher.ch/en/?

[1] We use the terms obese and obesity in this article because they reflect scientific discourse. We would like to note though that these terms have been criticized and rejected by many fat rights activists and fat studies scholars because they are understood as pathologizing fat bodies (e.g., [5]).

https://doi.org/10.1017/9781009201704.025 Published online by Cambridge University Press

care in clinical encounters. Furthermore, framing obesity in children as a negative outcome of maternal obesity runs the risk of 'replicating harmful stereotypes and misconceptions that contribute to stigma about fat children, which in itself can harm their mental and physical health and imperil their safety' [6, p. 215]. These narratives could be productively rescripted to focus on access to tasty, culturally appropriate, nutritious, and affordable food for parents and children rather than pathologising the size of their bodies. When we rely on narrative conventions we inherit from our field, we can miss the opportunity to ask critical questions about how to tell responsible stories about our research. While we don't always have control over how our research is interpreted in other arenas, carefully constructing narrative choreographies increases the likelihood that our research will have the social impact we desire.

Our years of working with DOHaD researchers have taught us that many researchers in this field do research explicitly with the intention of affecting positive changes in the world: they want to increase the health and well-being of people, especially those who have historically been disadvantaged, marginalised, and underserved. However, current narratives emerging from DOHaD often unintentionally serve to further stigmatise these groups rather than support their health and well-being [7, Chiapperino et al. in this volume].

In this chapter, we advocate for deliberately choreographing DOHaD narratives to address structural inequality and support struggles for social justice and health equity. In order to do this, we suggest moving away from focusing on individual responsibility, and instead, emphasising the social determinants of health. A narrow focus on individual responsibility can unduly blame people for their health status and the health status of their children, without addressing the causes of inequality, which are structural and socially determined. We further recommend crafting narrative choreographies that avoid pathologising people who have experienced early life adversity, and instead focus on possibilities for healing, growth, and health throughout the lifecourse.

In your own research area, you will likely have a sense of some of the harmful narratives that circulate among researchers, in policy, and in the wider media; these may be different than those we present here. We encourage you to reflect on how to choreograph your DOHaD narratives to avoid harmful social and political implications and to suggest policy interventions that better support parents, children, and communities. We offer three examples from our own research to demonstrate how to recognise narrative choreographies at work in DOHaD and neighbouring fields with an eye towards avoiding potential pitfalls and connecting research with the real-life challenges that communities face due to inequality and discrimination. We conclude by offering recommendations for DOHaD researchers who are interested in workshopping their own narrative choreographies.

23.1 Example #1: Epigenetics of Maternal Care

Our first example comes from a research area that has emerged from a series of experiments on the epigenetic effects of maternal care in rats conducted at McGill University. These experiments have not only been influential within the field of environmental epigenetics but also in fields like DOHaD that have significant policy implications. The McGill group found that when a mother rat licks and grooms her pups regularly, it leads to the stronger expression of a glucocorticoid receptor gene in the pups' brains, which makes them calmer and easier to handle as adults [8]. When there is less licking and

https://doi.org/10.1017/9781009201704.025 Published online by Cambridge University Press

grooming behaviour, they found that the rat pups become more anxious and aggressive, a change in behaviour that is considered to be epigenetic in origin and is thought to last throughout the lifecourse. When this research is translated into claims about human behaviour and health, it is often embedded in narrative choreographies that blame mothers for undesirable epigenetic changes that affect the health and well-being of their offspring [1, 9, 10]. Despite the fact that rats do not practise bi-parental care, the model organism findings are used to argue that human mothers are responsible for the future health and disease of their children, without paying attention to the role of fathers, extended family, paid caregivers, and the environment beyond the home [11]. This too-quick translation between model organisms and humans leads to narratives that focus on mothers' parenting behaviours without considering the larger social and economic environment in which parenting occurs [10].

For example, in the article, 'Maternal warmth buffers the effects of low early-life socioeconomic status on pro-inflammatory signaling in adulthood' [12], Chen et al. use the McGill experiments to frame their research on 'maternal warmth' in humans.[2] They find that in low socio-economic status (SES) households, high levels of maternal warmth protect children against the negative health effects of poverty, which they measure via biomarkers of immune activation and systemic inflammation. At the end of the article, they discuss the policy implications of this research:

> Working to alleviate poverty, as lofty and important a goal as this is, has remained an intractable problem in our society. Complementing this effort, encouraging and teaching parenting behaviors that facilitate warm emotional climates, even in the face of adversity, might prove to be a supporting, effective target of intervention (as suggested by cross-fostering and environmental manipulation studies in previous animal research).
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> [12, p. 735]

By framing poverty as 'intractable', these researchers advocate instead for interventions on the individual level, such as parenting classes for low-SES women. This narrative choreography precludes interventions that target the upstream social determinants of health, and instead places the burden of social transformation on low-SES mothers to protect their children from a world that is stacked against them from the start. Furthermore, they do not discuss the structural reasons for low-SES status such as racism, discrimination against people with disabilities, and xenophobia.

Individual interventions are popular in a neoliberal policy climate that seeks the most cost-effective solutions to public health problems. However, these interventions do not target the root cause of health inequity and put the burden for change on the most vulnerable. In the US context, where systemic racism limits life chances for Black Americans, prominent political activist and scholar Angela Davis and her sister, Fania Davis – a leader in the restorative justice movement – write:

> While the difficulties besetting the family should by no means be dismissed, any strategies intended to alleviate the prevailing problems among poor Black people that methodologically target the family for change and leave the socioeconomic conditions perpetuating Black unemployment and poverty intact are doomed to failure at the outset.
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> [13, p. 81].

[2] See Kenney 2022 [11] for a longer discussion of this article and the problem of interventions that target individuals.

https://doi.org/10.1017/9781009201704.025 Published online by Cambridge University Press

Following Davis and Davis, public health interventions that focus on poor and racialised mothers[3] fail to support efforts for anti-racism and economic equality [see Valdez and Lappé in this volume]. Rather than parenting classes and other forms of public health surveillance, Chen et al. could advocate for more parenting *resources*, such as paid parental leave, free daycare, and affordable food and housing. Local activists and organisations as well as researchers in sociology and social work who support low-SES parents might be able to offer specific policy recommendations that would be relevant to their goals. Seeking out the necessary experts and expertise for crafting responsible narratives and policy recommendations is essential for DOHaD research to have a positive impact on the life worlds of the people they study. We include specific recommendations for interdisciplinary inquiry and collaboration at the end of our chapter.

23.2 Example #2: NEAR Science Trainings

In our work on the McGill experiments on the epigenetics of maternal care in rats [10], we became concerned by narrative choreographies that focused almost exclusively on the *damage* caused by early-life adversity. We felt that a focus on damage without a concomitant discussion of healing and reversibility could run the risk of pathologising those who have experienced childhood adversity and increase stigmatisation and discrimination [14; see also Meloni et al. in this volume]. However, in our later fieldwork in the US Pacific Northwest, we were surprised to find that this research had been taken up by actors outside of DOHaD and public health and placed into a different narrative choreography that emphasised how widespread early-life adversity is and that focused on possibilities for healing, health, and well-being throughout the lifecourse.[4]

At our field site, actors reported a crisis in schools, which was characterised differently depending on who we spoke to. This is how the crisis was framed by a community leader at a local nonprofit:

> We have a very high teen suicide rate here. The school district, the reason that they became motivated for trauma-informed practices [was that] they had two high school students the same year [die by] suicide. It's a small school, right? The then-superintendent was just devastated. And she goes to her school board and says, 'We had two kids kill themselves. We've got to do things differently.' They didn't know what to do differently, but she and her district became kind of like this learning community.
>
> (NEAR-org 2)

One of the novel approaches they adopted to address this crisis was NEAR Science trainings. These trainings are based on the findings of the CDC-Kaiser Adverse Childhood Experience (ACE) Study, which shows that the more ACEs a person has experienced out of an ACE score of 10,[5] the more likely a person is to develop negative

[3] It is also important to note that policy interventions that focus on the poor mothers are often covertly targeting racialised mothers in the United States and other national contexts. This can inflect how the problems and the solutions are framed, even if race is not explicitly mentioned in the article.

[4] For more information on our findings, see Müller and Kenney 2020 [4].

[5] The ten Adverse Childhood Experiences (ACEs) that make up the ACE score are as follows: emotional abuse, physical abuse, sexual abuse, mother treated violently, household substance abuse, mental illness in household, parental separation or divorce, criminal household member, emotional neglect, and physical neglect.

https://doi.org/10.1017/9781009201704.025 Published online by Cambridge University Press

physical and mental health outcomes across the lifecourse. In the trainings, trainers combine the ACE Study with more recent research findings in epigenetics and neuroscience to explain how ACEs can lead to negative health and behavioural outcomes. The NEAR acronym brings these different research strands together; it stands for Neuroscience, Epigenetics, ACEs, and Resilience.

Although the findings of the CDC-Kaiser ACE Study can be discouraging for those with ACEs, the trainers frame the NEAR Sciences as 'sciences of hope'. They employ narrative choreographies that deliberately avoid biological determinism (i.e. ACEs always lead to negative health outcomes) and pathologisation (i.e. stigmatising people with ACEs). For example, after saying that toxic stress can rewire the brain to expect danger everywhere, the trainers make clear that this is not necessarily negative or a disease state; they explain that people with ACEs have 'protector brains' and are well suited for high-stress careers such as 'first responder'. Trainers emphasise that ACEs are common and that having ACEs does not necessarily mean future ill health. They tell the story of a doctor who was highly successful and respected in her community. When she attended a NEAR Science training, she raised her hand during the discussion and said, 'I have all ten ACEs; why did I turn out so well?'; she went on to talk about the support she received in her life that led to her success. This story is used to illustrate how resilience – which is often defined as interpersonal – can protect people against the potential negative health effects of ACEs. One adage that trainers repeat frequently is that a positive relationship with 'one caring adult' can support resilience. Although this at first may appear similar to the notion that maternal warmth can 'buffer' against early childhood adversity, the NEAR Science trainings move the locus of responsibility out of the home and into the community and the institutions that support children (e.g. schools). They emphasise that this "one caring adult" does not have to be a mother or parent to be effective. Thus, in the NEAR Science trainings, the biology of early life adversity is framed as actionable with community support, rather than dooming people to a life of poor mental and physical health.

When ACEs are framed as deterministic, prevention becomes the only solution to the problem of ACEs. And while prevention is important, it does not help those who have already experienced early-life adversity live healthy and fulfilling lives. The narrative choreographies of the NEAR Science trainings emphasise that ACEs are common and assert that it is possible to intentionally build resilience in individuals and communities. For example, inspired by the NEAR Science trainings, schools are making changes to how they address difficult behaviours. In the NEAR Science framing, these behaviours are understood to be as a result of ACEs rather than wilful disobedience. Therefore, schools are intentionally reducing punitive disciplinary measures, such as suspension and expulsion, and introducing practices from restorative justice and trauma-informed care [4].[6] Restorative justice is an established alternative to punitive justice that focuses on building and maintaining relationships and repairing harm. This approach allows children to engage in social-emotional learning and mend relationships rather than be excluded from the community when they harm others. This rejection of received forms

[6] This is especially important in the US context as suspensions and expulsions are strongly correlated with adult incarceration. The disproportionate punishment of Black children in schools contributes to the disproportionate incarceration of Black adults – a phenomenon known as the school-to-prison pipeline [25].

https://doi.org/10.1017/9781009201704.025 Published online by Cambridge University Press

of punitive discipline and this new focus on maintaining strong interpersonal relationships creates novel possibilities for children with ACEs – and indeed all children – to flourish in the school environment. The narrative choreography of the NEAR Science trainings, with its emphasis on growth, learning, and healing throughout the lifecourse, makes these kinds of novel interventions possible.

23.3 Example #3: An Obesity Epidemic in the Global South?

The last example we will discuss concerns the effects of maternal nutrition on children's health. While maternal nutrition is a broad topic of concern within DOHaD [15], here we specifically focus on discourses within DOHaD that engage with the rise in average BMI in the Global South [16]. Researchers in DOHaD have been warning that obesity is on the rise in nations such as India where eating habits are changing, and more people are adopting a so-called 'Western diet'. This shift is thought to increase the risk of non-communicable diseases (NCDs) in the population. In the popular science book, *Mismatch: Why Our World No Longer Fits Our Bodies*, Gluckman and Hanson have argued that this dietary transition constitutes a ticking 'lifestyle disease timebomb' [17], while others have called India the new 'diabetes capital' of the world [18]. The DOHaD explanation for India's rise in average BMI and NCDs is that there is a mismatch between the current nutritional environment and the nutritional environment of the previous generation. In utero, the current generation was exposed to their mothers' diet, which is assumed to be variously 'less processed', 'traditional', or contributing to 'undernourishment'. Experiencing their mother's diet as a fetus would have programmed the bodies of the current generation to anticipate low-caloric foods through their lifecourses. Thus, their bodies would exhibit a 'thrifty' metabolic phenotype that gains body weight easily when transitioning to a calorically dense 'Western diet', putting them at an elevated risk of NCDs.

Narratives in the DOHaD literature about why eating patterns change in post-colonial contexts such as India are often focused on individual choices: adopting a Western diet is thought to be a sign of wealth and cosmopolitanism, particularly in the growing Indian middle class (see, e.g. [19]). Indians in this context are often framed as eager to catch up with the West and unaware of the possible health consequences of their new diet. At the same time, phrases like 'lifestyle disease timebomb' construct Indian bodies as a threat to themselves as well as to global health. By adopting these paternalistic and alarmist narrative choreographies to discuss emerging health challenges in India, DOHaD inadvertently perpetuates colonial tropes that serve to obfuscate histories of colonial violence and persistent post-colonial power differentials. It also upholds the notion that it is the role of Western science to educate and manage non-white bodies in the Global South – an ongoing legacy of colonial science.

There are different narrative possibilities, however. When discussing a rise in median BMI in India, DOHaD researchers could draw attention to how Western food corporations have come to colonise food markets in the Global South and increasingly control the foods that are available to the local population, as well as large-scale industrial agriculture that encourages monoculture. They could also discuss the shift in priority setting in local agriculture towards crops for export rather than traditional foods for local consumption. In this context, researchers could partner with local social movements and activists who work to achieve food sovereignty and access to healthy, affordable foods and follow their lead in how to define problems, solutions, and interventions.

https://doi.org/10.1017/9781009201704.025 Published online by Cambridge University Press

23.4 Recommendations for Narrative Choreographies

Drawing on the three examples listed above, we have compiled two sets of recommendations for DOHaD researchers who are interested in connecting their research to social justice and health equity goals. The first is a set of suggestions for developing an active practice of choreographing DOHaD narratives. The second is a list of pitfalls we have observed in commonly circulating DOHaD narratives. These lists are not exhaustive, and we fully expect pitfalls to change over time as the research field grows and narratives change. The important part is to recognise that storytelling is a consequential scientific practice and to reflect on the social and political effects of the stories we tell about our research.

23.5 How to Make and Revise Your Narrative Choreography

- Reflect on the narratives you are currently using when communicating your research. Consider why you are using these narratives and how they could be reimagined to better support positive change. Ask yourself: who is included in the narrative, and who is excluded? Who is held responsible for healthy/unhealthy development, and do they have the resources and support needed to effect change? Does this narrative reinforce or challenge existing inequalities? Are there any implicit stereotypes about gender, race, sexuality, disability, fatness, or other categories of difference that should be addressed? Which policy positions does this narrative support or undermine? Does this narrative explicitly advocate for social justice and health equity goals?
- Partner with stakeholders, communities, and organisations that represent and support vulnerable people. Learn about the real-life problems that parents, children, and communities face and what kinds of interventions and resources would most benefit them. If possible, connect your research findings with these goals.
- Reach out to colleagues in other fields such as science and technology studies, education, social work, history, women and gender studies, and ethnic and area studies as potential research partners to benefit from their expertise and to learn viable alternatives to dominant narratives.
- Deliberately plan your narrative choreographies. Decide which framings and interventions you want to promote and which might be harmful and should be avoided. Consider whether the language you are using supports this plan or surreptitiously works against your goals. Practise your narrative in front of different audiences to learn how it is received and make changes accordingly.
- Revise your narratives. Storytelling is situated. What might work well in one context may not work in another [20]. Re-choreograph narratives for different audiences and as political language and awareness changes. For example: what does it look like to talk about racism and health in the wake of the Black Lives Matter movement? Or childhood sexual abuse after the #MeToo movement?

23.6 Pitfalls to Avoid

- Avoid policy recommendations that identify marginalised individuals and families as the singular target of intervention. Employ narrative choreographies that emphasise structural issues such as racism, wealth inequity, and the upstream social determinants of health. Connect DOHaD findings to key issues in social

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justice and health equity. Advocate for resources that support parents and children's healthy development.

- Avoid narratives that pathologise those with ACEs or perinatal exposures. Instead, use non-deterministic frameworks that acknowledge opportunities for health and resilience across the lifecourse. Recognize that early-life adversity is common; when early-life adversity is framed as rare and pathogenic, it can alienate and shame people with these experiences. Partner with educators and others who work with children to create institutions and programmes that support social-emotional growth.
- When doing research that involves a different national or social context, pay attention to power differentials and to how global histories shape the available narratives. No matter what our social position and national context, it is important to avoid imposing our own problem/solution framework on the lives of others. Often people themselves are the best experts on their own lives and can readily identify which problems are important/unimportant and which interventions are helpful/harmful [21]. Avoid using alarmist language and terms like 'obesity epidemic' or 'disease timebomb' to speak about entire populations, and thereby, implicitly framing them as a danger to themselves and to global health writ large.
- Avoid pathologising obesity in pregnant women/people and in children in both research and clinical encounters. Making people feel shame about their bodies is an 'affective determinant of health' [22] that can negatively impact pregnancy and health outcomes [23]. DOHaD narratives should support people's health goals regardless of their body weight, disabilities, mental health status, etc. Health can act as a moral category [24] that is used to shame people who 'deviate from an imagined ideal norm of health, youth, fitness and . . . attractiveness' [22]. It is important to avoid shaming and blaming those who fall outside of a perceived norm. Question your own assumptions about health and listen to those who have had negative experiences with the healthcare system.
- Reflect on your own research area and add any additional pitfalls you haven't seen to this list.

We believe that many researchers in DOHaD are committed to strengthening social justice and health equity worldwide. We offer these recommendations in a spirit of collaboration and hope that they open more opportunities for partnership across disciplines and sectors as we attempt to address the significant public health implications of DOHaD. Deliberate narrative choreographies, narrative choreographies that link NCDs back to structural violence and avoid individual blame, constitute one important practice in the co-creation of responsible biomedical research and clinical practice.

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