A Lively Introduction: New Materialisms, Feminisms, and Moving Bodies

Limbs yearning to stretch. Waiting for the skies to clear, if just for a brief moment, to push the door open, to breathe deeply without fear of contamination. From ash particles in the air, to bodies dispersing invisible viruses. The moving body is noticed differently. Athletes stranded, sports events postponed, new questions without answers. Yoga classes cancelled, gyms and swimming centres closed. Walking, cycling, jogging—everyday physical activities, once taken for granted, now constrained within familiar spaces made strange. Deep longings to run, leap, and jump freely, without the draw of pollutants and toxins into the lungs. The surfaces and objects of everyday life, all holding the possibility for foreign bodies entering silently, dangerously.

Responding to the tingling of desire in her muscles, she pushes away from the computer that is both critical to her social connections and productivity and a source of sadness, panic, and despair. Images of death and destruction increasingly fill the screen. Picking up the phone always at her side, in her palm, at her fingertips, tucking it into the plastic sleeve on her arm. Stepping out into empty streets, to run with and away from ever building anxiety in her chest, and adrenaline and cortisol surging through her veins. But the light thud of her shoes, connecting with asphalt, familiar rhythms offering momentary calm. Sweat appears on her skin only to be wicked away by purpose-built
clothing. Leaving just a trail of deodorant in the breeze. Blood flows beneath the Lycra layers as oxygen draws deeply into the lungs. The moving body porous to the environment in all its beauty, wonder, joy, and with all the possibilities of terrors unknown. Bodies, environments, technologies, objects: Entangled.

The year of 2020 has introduced many to the extreme dangers of environmental degradation, climate change, and pandemic. Of course, these processes have been underway for many years—decades, centuries, and beyond—and Indigenous peoples and scientists alike have warned of the long-lasting, and possibly irreversible, damage of colonialist, anthropocentric, patriarchal, and capitalist ways of knowing and being. As many are jolted from their everyday patterns and lifestyles too long taken for granted, new questions are being asked about the possibilities of alternative futures. Perhaps now, more so than ever, is the time to look towards the posthumanisms and new materialisms to explore the offerings for thinking, knowing, and doing differently. As Pitts-Taylor (2016) writes, new materialists are interested in “exposing the movement, vitality, morphogenesis, and becoming of the material world, its dynamic processes,” and in so doing, are working to “rethink the terms of social theory” (p. 4).

This book explores the contributions of new materialist thought to the study and understanding of moving bodies and engagements in physical activity, fitness, sport, and physical culture. In so doing, it offers insights into our individual and collaborative journeys working with new materialisms and the ethico-onto-epistemological implications for feminist research practices and processes. Recognizing the diverse and eclectic body of work that constitutes the material turn, we build upon its foundational acknowledgement of matter as lively, vital, and agentic to elaborate understandings of moving bodies and their entanglements with human, nonhuman, biological, cultural, technological, material, and affective forces in contemporary society. This book seeks to extend humanist, representationalist, and discursive approaches that have characterized the landscape of feminist research on active bodies, and invites new imaginings and articulations for moving bodies in uncertain times and unknown futures.

This introductory chapter consists of three main parts. We begin by locating the book in the strong foundational knowledge of feminists of
foundations and future imaginings: feminism, sport, and moving bodies

we write this book in continuation of a long history of feminist theorizing about the physically active and moving body. beginning in the 1960s and 1970s, feminist sport studies examined the differences between men’s and women’s opportunities to participate in sport and physical activity. since then, feminist studies of sport and physical activity have developed into an expansive field spanning an array of topics and using a multitude of theoretical approaches (markula, 2005). in the 1980s, more critical sociological approaches to feminist sports studies were being developed with a focus on sex/gender distinction and the negative impacts of patriarchal structures and practices on women’s roles in sport and society. during this time, feminist sport sociologists and historians used various theories (i.e., marxism, material feminism, socialist feminism) to explore sports in relation to the ideology of masculinity, women’s oppression and resistance, and social transformation (e.g., birrell, 1988; birrell & cole, 1994; hargreaves, 1986; theberge, 1984, 1985; vertinsky, 1994).

building upon this foundation, in the 1990s and 2000s, feminist scholars became interested in social constructionist approaches, using poststructuralist theory to explore the role of sporting discourses in the production of gender and gendered ideologies. this shift meant that scholars began to move away from a focus on ideology, hegemony, and the state, and towards poststructuralism which emphasized competing
notions of truth, fragmented and multiple subjectivities, and the relational aspect of power (King, 2015; Markula, 2018). Scholars gravitated towards theorists such as Gilles Deleuze, Michel Foucault, Judith Butler, Jacques Lacan, and Jacques Derrida, to explore the relational aspects of gendered power and how it is reproduced and challenged through sporting and physical cultural discourses (Adams, 2005; Birrell & Cole, 1994; Cole, 1993; Fullagar, 2010; King, 2006; Markula, 1995, 2003, 2006; McDermott, 1996). Important research has also drawn upon various strands of critical race and feminist theory—i.e., transnational feminisms, Indigenous feminisms, post-colonial feminisms, intersectional feminisms—to reveal the politics of race, ethnicity, culture, and religion in women’s experiences of sport and physical culture (e.g., McGuire-Adams, 2020a, 2020b; Palmer, 2016; Ratna, 2018; see Ratna & Samie, 2018 for an excellent overview). Scholars interested in the lived experiences of women in physical culture have also used theories such as phenomenology, affect theory, and non-representational theory, in addition to concepts such as embodiment to explore the corporeal, sensual, and affective dimensions of women’s sporting lives (e.g., Allen-Collinson, 2011a, 2011b, 2017; Allen-Collinson & Owton, 2014; Francombe-Webb, 2017; Pavlidis & Fullagar, 2013, 2014). In so doing, critical scholars have continued to draw upon feminist theories of the body and embodiment to examine the multiple ways that power operates on and through moving bodies in a range of sporting, fitness, and physical cultural contexts (for an excellent overview of this work, see Mansfield, Caudwell, Wheaton, & Watson, 2018).

Taking cue from feminist theorizing, a growing number of scholars within sociology of sport and physical culture are engaging with new materialist and posthumanist approaches (Giardina, 2017; Newman, Thorpe, & Andrews, 2020a). In so doing, they are exploring a range of topics such as protein powder as more-than-human foodstuff (King, 2020; King & Weedon, 2020a, 2020b), sand dunes as active agents in golf courses (Millington & Wilson, 2017), swimming and surfing in polluted bodies of waters (Evers, 2019a; McDonald & Sterling, 2020), and the human and nonhuman agents in sport for development (Darnell, 2020). Critical sport scholars are engaging with new materialisms and posthumanism in various ways, but primarily understand them as helpful
approaches for exploring “the complex interactions of language and matter, the human and the nonhuman” (Hekman, 2010, p. 4). Feminist scholars of sport and physical culture have been leading such innovative engagements with new materialisms and posthumanism (Baxter, 2018, 2020; Fullagar, 2017; Fullagar, Pavlidis, & Francombe-Webb, 2018; Jeffrey, 2020; Markula, 2019; Thorpe, Clark, & Brice, 2019). They are using new materialist theory to think differently about a range of issues such as female athlete health (Thorpe, 2016; Thorpe & Clark, 2019; Thorpe et al., 2019), depression, mental health, and recovery (Fullagar, 2020; Fullagar & O’Brien, 2018; Fullagar, O’Brien, & Pavlidis, 2019), women’s yoga lifestyles (Jeffrey, 2020), online media platforms (Reade, 2020; Warfield & Demone, 2018), Fitbits and digital tracking (Clark & Thorpe, 2020; Esmonde, 2019; Lupton, 2013, 2019c), as well as new ways of “collecting and representing” data (Lupton, 2019b; Markula, 2019).

While some feminist sport sociologists are engaging with new materialisms to ask new questions of the gendered moving body, it is no way a dismissal of existing approaches or the important work that has come before. As leading new materialist scholar Karen Barad asserts, new materialisms are “not a breaking with the past, but rather a dis/continuity, a cutting together-apart with a very rich history of feminist engagements with materialism” (Barad in Juelskjær & Schwennesen, 2012, p. 13). Similarly, Davies (2018) makes clear that new materialisms present “new concepts and new ways of thinking-doing our research,” yet such approaches “do not run against post-structuralist philosophy, but with it at the same time bringing new emphases and new priorities” (p. 13). It is these new emphases and new priorities that help to differentiate the nuanced ways of knowing within new materialisms that we turn to now.

**Key Tenets of New Materialisms and the Moving Body**

Referred to variously as the ontological or posthuman turn, vitalist theories, and ‘more-than-human’ approaches, among other monikers, the new materialisms refer to an evolving scholarly tradition that confronts
the assumed boundaries between nature and culture and counters human-
ist approaches to contemporary thought (Coole & Frost, 2010a; Dolphijn
& van der Tuin, 2012; Fox & Alldred, 2018a). Prompted by increasing
dissatisfaction across the social sciences and humanities with the privileg-
ing of language, culture, and discourse as arbiters of meaning, new mate-
rialisms acknowledge the agentic capacities of matter and its role in
shaping experience and meaning. This emerging body of knowledge is
informed by an eclectic array of disciplinary foundations and draws upon
the work of contemporary thinkers such as Karen Barad, Rosi Braidotti,
Jane Bennett, Gilles Deleuze (with Felix Guattari), Donna Haraway,
Bruno Latour, and Brian Massumi, among others. Over the past decade,
a series of comprehensive volumes espousing the promise of new materi-
alist thought have chronicled its emergence, contributions, and underly-
ing tenets (see Alaimo & Hekman, 2008a; Coole & Frost, 2010a;
Dolphijn & van der Tuin, 2012; Pitts-Taylor, 2016).

Some authors have attempted to distil this vast body of literature into
guiding principles so as to provide more accessible entry points (e.g.,
Connolly, 2013; Fox & Alldred, 2016a, 2018a; Lupton, 2019c). While
not exhaustive, such efforts help capture and communicate key points.
For example, Nick Fox and Pam Alldred (2018a) provide a summary of
five characterizing features of new materialisms that “afford a variety of
theoretical and practical opportunities” (p. 4). Briefly, these features
include:

1. A rejection of discrete boundaries between the social and natu-
ral worlds.
2. An assumption that the material world is contingent, relational, and
uneven. The authors clarify, “For new materialists, human bodies and
all other material, social, and abstract entities have no ontological sta-
tus or integrity other than that produced through their relationship to
other similarly contingent and ephemeral bodies, things and
ideas” (p. 4).
3. A re-imagining of agency as assigned to and distributed across all mat-
ter, including the human and nonhuman, the animate and inanimate.
Put simply, agency is not the exclusive feature of the human.
4. The provision of a socially, politically, and materially embedded framework with and through which to “research the social world and to seek to change it for the better” (p. 5).

5. A concern with ontology over epistemology, or more specifically, with dissolving the binary between them, which the authors note has implications for how we go about conducting research through a new materialist lens (see Chap. 2 of this book for elaboration).

Deborah Lupton (2019c) also provides a helpful overview, focusing on feminist new materialisms and with a concerted interest in how this work helps re-imagine human-technology relationships. Lupton emphasizes the following overarching assumptions that underpin feminist new materialisms:

1. Recognition of the contribution of nonhuman actors in configuring material realities in what Lupton (2019c), drawing on Braidotti (2019a), refers to as “more than human worlds” (p. 1999).

2. An interest in the fleshy, affective, and sensory dimensions of human existence and experience and acknowledgement of distributed agency among human and nonhuman entities.

3. The centrality of the relationships between humans and nonhumans as a focal point for inquiry.

4. The political orientation of feminist new materialisms as it explores gendered dimensions of material processes, power relations, the environment, and the Anthropocene.

This necessarily succinct summary does not capture the nuance of the arguments these authors have thoughtfully developed, but is offered to highlight the various efforts to provide concise overviews of new materialist thought.

In arriving at our own interpretations and understandings of this broad corpus of work, we too were called upon to identify what we considered defining, overarching themes that guide our thinking practices with new materialisms. The process of writing this book has underlined to us the continuous and necessary evolution and dynamism of new materialist theorizing. Therefore, we are hesitant to offer any definitive characteristics
here. Instead, we provide the reader with a mapping of the ethico-onto-
epistemological ideas that have found particular resonance in our efforts
to think differently about moving, sporting bodies. Drawing on those
principles outlined by Fox and Alldred (2018a), and Lupton (2019c)
above, as well as many others, we share three overarching ideas that have
guided our thinking and writing processes over the past five years.

Lively Matter

New materialist thought is concerned with the material processes of the
world and with the lively capacities of matter itself. In response to human-
ist ontologies that assume matter as passive and granted meaning only
through the determining forces of the human and culture, new material-
ist ontologies acknowledge matter as agentic, indeterminate, and con-
stantly ‘becoming’ in unexpected ways (Coole & Frost, 2010b). Here,
matter refers to bodies, the environment, and nonhuman entities that are
continuously implicated in a “field of force relations” that actively shape
social phenomena and human lived experience in unpredictable ways
(Markula, 2019, p. 1).

Working with new materialisms urges us to notice and attend to these
dynamic capacities of matter and human and nonhuman bodies in all of
their entangled complexities, effectively destabilizing the deep grooves of
Cartesian thought, which cleaves mind and body, subject and object,
matter and meaning, into hierarchical dualisms. In this arrangement,
which underpins so much of contemporary knowledge, matter is concep-
tualized as inherently inert, nature as subordinate to agentic human and
cultural forces, and the body as a passive entity, its vital impetus and self-
organizing capacities too often overlooked.

New materialist thinking pointedly seeks to reconfigure these static
understandings by re-assigning agency beyond the human and cultural
realm. No longer exclusively located within human actors, agency is
instead imagined as a feature and potentiality of all nonhuman and
human entities (Bennett, 2010a, 2010b; Latour, 2005). While specific
understandings of agency differ among the various strands of new mate-
rialisms, all push back on human exceptionalism, which places the
intentionally acting human at the centre of meaning and experience. In so doing, bodies (both organic and non-organic), environments, ecologies, technologies, and objects emerge as vital forces that demand our attention as they become part of the unfolding of the world (Barad, 2007; Bennett, 2010b; Braidotti, 2011, 2013, 2019b; Haraway, 1985, 1991, 2003; Latour, 2005)

This attention to the liveliness of matter has implications for how we study and understand moving bodies in their diverse environments and socio-political contexts, as well as their relations with nonhuman bodies and entities. Importantly, new materialists are not the first or only scholars to insist on the liveliness and mattering of matter. A rich tradition of feminist scholarship has long called our attention to the fleshy, sensory dimensions of corporeality and embodiment, underlining the serious constraints of the Cartesian mind-body dualism for our analyses and our ability to meaningfully respond to gendered power relations and their effects (Grosz, 1994; McWhorter, 1999; Shildrick, 1997). Many leading contemporary new materialist thinkers have come from this strong feminist foundation, building upon and extending these ideas for the complex challenges facing the world today. In rapidly changing conditions marked by environmental precarity, emerging technologies that extend and augment our bodily practices and understandings, and humanitarian crises that impact bodies (human and nonhuman) and lives around the globe, there is an urgent need for robust and responsive frameworks that attend to and account for the materializations of power relations and the generative role of nonhuman forces in shaping our socio-political contexts (Alaimo & Hekman, 2008b; Coole & Frost, 2010b).

These frameworks help us arrive at new questions and curiosities in relation to moving bodies and to their intimate entanglements with technologies and objects, human and nonhuman bodies, ecologies and environments, and social and political structures and forces. They also urge us to develop both our ability to attend to the agentic capacities of matter, as well as create new methods for analysis and representation. As Coole (2010) prompts us to consider: “is it not possible to imagine matter differently: as perhaps a lively materiality that is self-transformative and already saturated with agentic capacities and existential significance that are typically located in a separate, ideal, and subjectivist, realm?” (p. 92).
Critical sport scholars are increasingly taking up such questions. For example, in the introduction to their anthology focused on new materialisms, sport, physical culture, and moving bodies, Newman, Thorpe, and Andrews (2020b) explore the agentic capacities of gold, and particularly the gold medal won by the late Muhammad Ali (then Cassius Clay) at the 1960 Summer Olympic Games. Also in this book, leading feminist sport scholar, Samantha King (2020) proposes a multispecies sport studies to explore protein powder as vital matter.

Entangled Bodies

Attending to the liveliness of matter opens up new spaces in which to imagine, study and attend to the fleshy body itself; its biological dimensions, exertions, and affective embodied experiences. Importantly, acknowledging this liveliness requires a radical rethinking of the boundaries and dualisms that shape the ways we make sense of the world. Put another way, attending to the material calls into question how we think about the material in relation to the discursive or the social. As noted earlier, new materialist thought, although eclectic, has largely emerged from increasing dissatisfaction with the privileging of discourse and culture that resulted from the ‘linguistic’ or cultural turn (Alaimo & Hekman, 2008b; Barad, 2007; Coole & Frost, 2010b; Dolphijn & van der Tuin, 2012; Markula, 2019). Specifically, there is shared critique that discursive analyses tend to overlook the materiality of embodied, lived experiences, thus reducing such experiences to by-products of social forces (Feely, 2016; Kuby, 2017). In these analyses the material and discursive are understood as ontologically distinct and the discursive is identified as actively shaping matter and meaning in a linear, causal trajectory (Barad, 2007).

New materialist thought seeks to disrupt these binary understandings and to acknowledge the porosity and indeterminacy of the boundaries that maintain such dualisms. Given how deeply entrenched these categorical understandings are within dominant systems of knowledge, new ways of thinking are needed to “allow matter its due as an active participant in the world’s becoming” (Barad, 2003, p. 802). As feminist scholars
of sport and physical culture, we embrace ways of imagining the body as vital and agentic without losing sight of the complex ways it is also produced and productive of the social conditions in which it moves and becomes. In line with Markula (2019), we recognize the need to examine not only the body as matter, but also its everyday practices and movements in everyday spaces and places. By troubling the boundaries between mind and body, matter and meaning, we seek to pursue inquiry that acknowledges the “active, self-transformative, practical aspects of corporeality as it participates in relationships with power” (Coole & Frost, 2010b, p. 19).

As noted above, feminists working within sport sociology and physical cultural studies have made significant contributions to the scholarship of bodies and embodiment through their engagements with critical theory, phenomenology, poststructuralist theory, theories of affect, and more. Some are turning to new materialisms to interrogate the broader ecologies of materialities encountered and produced by sporting, active bodies (King & Weedon, 2020a, 2020b), and their entanglements with technologies and objects (Brice, Clark, & Thorpe, 2020; Clark & Thorpe, 2020). Making a particularly significant contribution to feminist new materialist understandings of moving bodies, Simone Fullagar (2020) diffracts mind-body relations in her explorations of the entanglement of physical culture in women’s recovery from depression (also see Fullagar et al., 2018; Fullagar et al., 2019). We wish to build upon this increasing momentum, elaborating and extending feminist acknowledgements and expressions of the body as a culturally situated and agentic force, capable of shaping and affecting other bodies, things, and spaces it encounters. By troubling binaries that separate the human and nonhuman, nature and culture, and subject and object, we are catapulted into uncertain onto-epistemological territory, providing new spaces in which to think about, with and through moving bodies.

Relational Politics and Vital Respondings

Feminist new materialisms broadly maintain themselves as a political project, yet critiques and caveats have been articulated. Some have
critiqued feminist new materialisms for a tendency to “displace political considerations by invoking new ethical responsibilities and sensibilities” (Lemke, 2018, p. 31). Writing specifically about Jane Bennett’s Vital Materialism, for example, Lemke (2018) argues that “being attentive to the vitality of things translates into a systematic blindness concerning the inequalities, asymmetries and hierarchies enacted in vital materializations” (p. 31). Such claims speak to broader concerns about the tendency of new materialist thought to inadequately account for difference and different lived experiences of the effects of power.

Importantly, while new materialisms recognize the vitality of nonhuman matter, it is not advocating for a flat ontology where all humans become ontologically equivalent to nonhuman matter. Nor is it attempting to homogenize humanity where all races, ethnicities, sexualities, and genders become equalized. Rather, it provides a way to think about difference and identity not as structured, fixed entities, but as emergent through relations. For example, in critically considering the implications of new materialisms for thinking about race, Hames-Garcia (2008) describes how new materialisms encourages a way of thinking that does not “simply reaffirm what race is and has been, but rather seeks a transformation of race into something new” (p. 331). A new materialist approach challenges predefined terms and identities based on difference, and instead explores human and nonhuman assemblages that give rise to the appearance and reproduction of difference.

Various new materialist, posthumanist scholars provide alternative ways of thinking about difference and identity politics (Barad, 2014; Braidotti, 2013, 2019a; Hames-Garcia, 2008). Drawing upon a history of feminist theorizing of difference, particularly work by Donna Haraway as well as physics philosophy, Barad (2014) uses her concept of diffraction to think about difference not as “an absolute boundary between object and subject, here and there, now and then, this and that” (p. 174), but as “formed through intra-activity, in the making of ‘this’ and ‘that’ within the phenomenon that is constituted in their inseparability (entanglement)” (p. 175). In her theory of agential realism, there is a strong focus on the way relationality and intra-actions give rise to conceptualizations of difference. In particular, bringing her concept of diffraction into dialogue with Chicana feminisms, Barad (2014) offers an approach that
“queers binaries and calls out for a rethinking of the notions of identity and difference” across spacetime affairs (p. 171). For Bozalek and Zembylas (2017), the key contribution of Barad’s concept of difference is that it is not “grounded in an ontological essentialism between identified categories (man/woman, working class/middle class, white/black, etc.)” but instead is “a relational ontology, that is, an effect of connections and relations within and between different bodies, affecting other bodies and being affected by them” (p. 118).

Similarly, Braidotti (2013, 2019b) looks towards alternative ways to conceptualize identity, difference, and subjectivity that is more relational and fluid. Braidotti (2019b) describes the posthuman subject as a “work in process: they emerge as both a critical and a creative project...they interrogate the self-representations and conventional understandings of being human, which ‘we’ have interpreted from the past” (p. 42). She acknowledges the material role that privilege continues to play in society, but also encourages scholars to reimagine difference as an “immanent, positive and dynamic category” (p. 12). Engaging with a posthumanist lens is “about increasing our relational capacity, so as to enhance our power (potential) for freedom and resistance. Posthuman thinking is post-identitarian and relational: it turns the self away from a focus on its own identity into a threshold of active becoming” (Braidotti, 2019b, p. 79). With such reimaginings of identity and difference towards more relational ethics with humans and nonhumans, new understandings of politics also become possible.

In new materialist thought, we find a political positioning that acknowledges the complex materialities of (human and nonhuman) bodies embedded in specific power relations (Dolphins & van der Tuin, 2012). According to Clare (2016), the notion of politics that emerges in new materialisms is at its best “not when it redefines politics so as to include non-human and more-than-human forces” but rather when it “reworks understandings of human subjectivity, making it clear how the human is always enmeshed in more-than-human worlds” (p. 61). We concur with Newman et al. (2020b) who take up these ideas in the context of sport and physical culture to explore the possibilities that new materialisms offer for “creatively reimagining’ the politics of the moving body as vibrant matter always entrenched within (not beyond) power,
politics, knowledge, and discourse” (p. 23). Feminist new materialist theory, in particular, offers a robust framework for attending to the body’s movements, responses, and affects, while also acknowledging bodies as socially and culturally produced entities, always “enmeshed” in broader material-discursive arrangements.

Critical scholars of sport and physical culture have long focused their attention on the multiple workings of power, and how inequitable power relations press upon bodies differently based on class, ethnicity, sexuality, nationality, (dis)ability, and gender. Engaging with new materialisms encourages us to attend to and respond to the complexities of bodies immersed in power relations in different contexts. But, it also requires us to balance our focus on lived experience and bodies within the broader economies, ecologies, and environments in which they are intimately entangled. With power being an important focus of any feminist inquiry, Pitts-Taylor (2016) reminds feminist new materialists of the need to continue to “ask certain questions of matter/ing and its interlocution”:

In what ways is matter involved in, or shot through with, sex/gender, class, race, nation, citizenship, and other stratifications? How are these power relations involved in the understanding and management of biology or ‘life itself’, and how do they materialize in bodies, corporeal processes, and environments? What sort of theoretical and methodological innovations are required to address matter as thusly situating and situated? (p. 2).

Within feminist new materialisms, politics and the political are conceived in a range of ways, ranging from Barad’s (2007) account of knowledge boundaries and ethics of mattering, to Braidotti’s (2015, 2019a, 2019b) posthuman affirmative ethics. Others are taking up such ideas and putting them into action in their own research practices, as seen in Fullagar, O’Brien and Pavlidis’ (2019) “vital feminist politics of personal and public feeling” (p. 1). Throughout this book, we provide insights into various conceptualizations of power, politics, and ethics under different branches of new materialisms, and the implications for thinking, knowing, and acting with/upon moving bodies differently.

With Fox and Alldred (2018a) and Lupton (2019c), we also identify the political imperative of new materialist thought as it interrogates the
conditions of knowledge production processes as well as our own situatedness within these processes. This means that working with and through new materialisms requires us to perform and engage with “response-ability” to the conditions of the world around us and to our fellow beings, human and nonhuman (Haraway, 2008). In the research context, we are challenged to notice, account for, and respond to the socio-material contexts and conditions in which active bodies move and become, and to our always politicized locations within such projects. Barad (2012) considers this capacity to respond as key to ethics, which she explains is “about responsibility and accountability for the lively relationalities of becoming, of which we are a part. Ethics is about mattering, about taking account of the entangled materializations of which we are part, including new configurations, new subjectivities, new possibilities” (p. 69).

To capture this inseparability between ontology, epistemology, and ethics, Barad (2007) coined the term “ethico-onto-epistemology” (p. 90). This inseparability holds dramatic implications for how we go about conducting inquiry. It demands that we acknowledge the inseparability of our theoretical frameworks, our research methods, and our ethical practices when engaging in knowledge production practices and with the world itself. It means we cannot understand ourselves as observing or thinking or writing from an external perspective, rather we are always implicated in and a part of the world’s becoming. Therefore, engaging in new materialist projects is an act of responsibility and of cultivating the ability to notice and respond to the world in its unfoldings. Response-ability, Barad (2012) suggests, entails “Listening for the response of the other and an obligation to be responsive to the other, who is not entirely separate from what we call the self” (p. 69). Importantly, this requires attending to and identifying power relations, the materialization and production of boundaries, and engaging in analyses that seek to articulate how these boundaries come to matter and the processes of materiality through which they emerge. As Haraway (2016a) writes, “We are responsible for boundaries, we are they” (p. 65).

While we were vitalized by the tenets outlined above, we were (and continue to be) critical in our engagement with new materialisms. We recognize the concerns about the lack of acknowledgement and the
limited engagement of some new materialisms with post-colonial and queer scholarship and Indigenous ways of knowing (Ahmed, 2008; Devellennes & Dillet, 2018; Shomura, 2017; Todd, 2016; Tompkins, 2016). As Rosiek, Snyder, and Pratt (2020) state, if new materialist scholars fail to “acknowledge and seriously engage the Indigenous scholars already working with parallel concepts,” they are at risk of reinforcing “ongoing practices of erasure of Indigenous cultures and thought” (p. 2). In Chaps. 3 and 7 we discuss in more depth the complex relationship between Indigenous knowledge and new materialisms, particularly in relation to understandings of nonhuman agency and the environment, respectively. As well as acknowledging the potency of such critiques, we also detail responses to such arguments, including the efforts of some to work critically at the intersection of new materialisms and Indigenous scholarship. For example, some Indigenous scholars are embracing the possibilities for engaging with ethico-onto-epistemologies that similarly critique western anthropocentricism and recognize the vitality of matter (Martin, 2017; Thomas, 2015). Others are responding to such critiques by experimenting with the entangled relations between Indigenous, intersectional, queer, feminist politics, and posthumanist practices, and in so doing are “explicitly grappling with the political and ethical ambivalences, contradictions, and failures of more-than-human research” in highly productive ways (Mayes, 2019, p. 1202; Kerr, 2019; Niccolini, Zarabadi, & Ringrose, 2018; Springgay & Truman, 2017). We concur with Mayes’ (2019) suggestion that there is much value in thinking new materialist and postqualitative research “together with decolonial, post-colonial and other critiques—as a fraught, frictional encounter” (p. 1204). Throughout the process of writing this book, we have found ourselves ‘troubled’ (Haraway, 2016b) by the issues raised in decolonial critiques of new materialist and postqualitative research, and like Mayes (2019) have attempted to work in and through these tensions “rather than to dismiss, refute or ignore it” (p. 1192). These entangled and “frictional encounters” are addressed in various chapters in this book (in particular, see Chaps. 3, 6, and 7).

As well as engaging the critiques about the relationship between new materialism and Indigenous worldviews and methodologies, we also take to heart concerns about the exclusivity and inaccessibility of the language
used, and its tendency to evoke a certain sensibility without providing tangible insights, or anything ‘new’ (Greene, 2013; MacLure, 2017; Pringle, 2020). These concerns resonate with many of our own encounters with new materialist ontologies. While we concur with some such concerns, we hope the time has come to rethink the familiar refrain (often from those who have yet to engage deeply with new materialist scholarship themselves): So ‘what is new’ in new materialisms anyway? To help us respond to such questions, we turn to St. Pierre, Jackson, and Mazzei (2016) who make clear, “the descriptor ‘new’ does not necessarily announce something new, but serves as an alert that we are determined to try to think differently” (p. 100). Given the complex conditions of the contemporary world and what is at stake for human and nonhuman bodies, ecologies, and environments, we are committed to this challenge, in all its possibilities, tensions, and failings.

In our ongoing reading, however, we were struck by the paucity of empirical examples from which to draw upon, and the lack of clarity about how to actually put new materialist theories to work. In short, the promise of new materialisms had been eloquently articulated, but we were now in need of understanding its possibilities, as well as limitations, when explicitly put into practice. Therefore, this book seeks to respond to critiques of new materialisms in two key ways. First, we work to make the ideas and concepts of new materialist thought accessible, to interrogate the concepts we take up and situate them in dialogue with existing scholarship so as to be clear about what they might offer us in the way of thinking the new. As per the title of this book, in the design of the overall project and each chapter, we seek to start the reader in familiar terrain and then invite them into the ‘entanglements’ of sport sociology and physical cultural studies with feminist new materialisms. Furthermore, we seek to achieve this by engaging explicitly with the empirical across diverse contexts and settings, and engaging with new materialist theory to work at the limits of our knowledge and imaginings of the sporting body. We also attend to our language, working to catch ourselves and each other when we write in ways that might exclude rather than explain. Second, we interrogate the process of thinking with new materialisms itself, acknowledging it as a political practice. We attempt to illustrate how we have used new materialist theories in our own inquiry processes.
and articulate how they have shifted and extended our understanding of bodies and of thinking practices themselves. In this process we also share the various roadblocks, detours, and uncertainties encountered along the way.

**Becoming with New Materialisms: Processes of Feminist Collaboration**

Some feminist new materialists have advocated alternative forms of feminist connections and writing practices. In so doing, they are building upon and extending the work of collaborative narrative and ethnographic scholars (i.e., Bochner & Rushing, 2002; Diversi & Moreira, 2009; Gale & Wyatt, 2009) to explore new ways of becoming. A notable example is the collaboration between Handforth and Taylor (2016) in which an emerging researcher and a senior academic employ “diffraction as an experimental practice to undo the normalized practices of academic writing by weaving together various kinds of texts” (p. 627). Similarly, drawing upon Deleuze to rethink academic relationships and processes, Fullagar, Pavlidis and Stadler (2017) explore doctoral supervision and collaborative writing as rhizomatic practice that “refuses ontological assumptions of linearity, causality and rationality,” instead following “embodied lines of thought, affective intensities and problematics that haunt the supervision relationship” (p. 23). Taking inspiration from such works, we sought to draw upon feminist new materialist and postqualitative approaches to more carefully and collaboratively orient our focus to the materiality of bodily processes, relationships, and entanglements through new materialist thought.

Although there are no clear beginnings or endings for this collaboration, it might be said that the ‘seed’ of this book was planted via a text message. As the supervisor and line-manager of two feminist new materialist projects focused on women’s moving bodies, Holly was walking on the beach after work one evening, while mulling over the overlapping themes of our various independent and collective academic projects. With the black sand of Aotearoa New Zealand’s west coast underfoot, she
wondered if our efforts and interests could be coalesced into a book that might resonate with others interested in similar themes; the lived experiences of active, sporting bodies, the environments and socio-political contexts in which they are embedded, and the relationships and knowledges that both constitute and are constituted through bodily doings. Quickly texting Marianne and Julie with the idea, her excitement was palpable, emanating through the blue screens on our smartphones. A creative, collaborative culmination of the ideas and concepts that had recently intrigued and moved us made absolute sense. And so, the idea of this book took hold; a fleeting, digitally communicated thought that has materialized in many words on the page, countless more conversations, and a good bit of sweat and tears, as we have alternatively limped and exalted our way to the finish line.

Together we share an ongoing orientation to women’s moving, sporting, and physically active bodies in different contexts and settings. Invested in the moving body as a social, biological, and cultural entity, we also share a persistent interest in robust conceptual frameworks that prompt us to attend to the vitality, force, and fleshiness of moving bodies while also acknowledging their situatedness within specific contexts and constellations of power. Consequently, over the course of several years we had all become immersed in and shared a cautious excitement for the emerging new materialist scholarship, curious about what it might offer to those of us well versed in critical and poststructuralist concerns with language and discourse. With its emphasis on the agential capacity of matter (including objects, bodies, and the environment) and refusal of the assumed boundaries between matter/discourse, nature/culture, subject/object, new materialisms seemingly provided a space in which previously less spoken about and tentatively broached aspects of women’s moving, sporting bodies were explicitly brought to the fore: sweat, blood, emotions, objects, affects, and things. As we read through the work of those scholars who are generally included under the expansive umbrella of new materialist thought, we found resonance in the idea that matter actively shapes meaning and experience, allowing us to expand our understandings of the capacities of the moving body. Consequently, we challenged ourselves to new ways of thinking within our projects, with the hope of extending and elaborating on the existing wealth of feminist scholarship
in sport and physical cultural studies about women’s sporting bodies, movement experiences, and their construction and representation.

Importantly, this book is not the culmination of three separate projects merged together with clever signposting and segues. Rather, our formal collaboration that commenced with a text sent from the beach had been taking shape in many informal intra-actions over a period of many months; office and hallway conversations between a mentor and student, between two feminist collaborators, over coffee and during walks on campus and through local neighbourhoods. The ideas continued to spark through these conversations. As the book became a ‘thing’ bringing us together with a shared goal, we continued to explore new methods to live the theoretical ideas and concepts through our individual and collective projects. These methods often included digital technologies as well as shared movement-based activities. For example, we spent seven months wearing the same brand of high-performance sports bra while reading Barad (see Chap. 4), and regularly commenting and engaging in a digital dialogue using Facebook messenger (see Brice, Clark & Thorpe, 2020). Two of us (Marianne and Holly) did something similar wearing a Fitbit for two weeks and using text messages to share our almost daily theoretically inspired noticings (see Clark & Thorpe, 2020). Alongside these projects, we experimented with a range of movement-based theoretical discussions, such as a shared yoga class (following an online instructor) followed by a critical dialogue with new materialisms. We also established a movement-based new materialist reading group at our university to explore some of the ideas presented in this book, and we acknowledge that this book emerges through and as part of these entangled intra-actions and relationships with our colleagues (Barad, 2007).

The book commenced when we were all living in Aotearoa New Zealand, but as is typical of many academic lives, there was a lot of physical movement that impacted our collaborative processes. In particular, as Marianne’s postdoctoral fellowship ended, she moved back to Canada before taking up a new position in Australia. Julie also travelled home to the United States for prolonged periods, while Holly travelled often for conferences and speaking engagements. As our physical locations changed during the writing of this book, we utilized a range of digital technologies (i.e., email, text messages, Facebook messaging, meetings via Zoom,
Skype and Messenger, Google docs) to support each other in the writing process, and to encourage us to collectively go deeper in our engagement with new materialisms.

Importantly, we acknowledge we are three white, cis-gender, able-bodied privileged women working in academia, engaged in politicized meaning making practices that have material implications and consequences. The similarities between us are important; they are profoundly political, and throughout the writing of this book we have encountered the various ways they matter, and concede we have much more, ongoing work to be done here. Thinking with and through new materialisms, we have challenged ourselves to imagine and articulate specifically how our similarities and differences come to matter in relation to writing this book. Through such processes we came to understand that we are different in seemingly invisible but important ways. We work within the privileges of academia, but one of us is a tenured full professor, which means she writes this book in a specific set of material-social conditions. One is a PhD student and the other a postdoctoral fellow, with all the freedoms, possibilities, uncertainties, and restraint of such positions. We are implicated in and constrained differently through these power relations. Additionally, we grew up in and are citizens and residents of different countries (i.e., Aotearoa New Zealand, United States, and Canada) where our white, gendered bodies are lived and located in very different histories, processes, and practices of colonialism and patriarchy. Two of us live and write very far away from the countries we call home. Two of us have children. And with a focus on moving bodies, we came to understand age, physical ability, fitness, health, resources, and even body shapes and sizes, as important differences that affected our theoretically informed sporting and physical activity experiences. We each came to this collaborative project with a range of past and present experiences across a variety of elite and recreational sport and fitness contexts and with various professional roles in these industries (i.e., athlete, coach, instructor). These differences do not fall along the defined categorical lines we often explicitly recognize, yet, they matter. They manifest in the repetition of minute gestures and practices and daily rhythms over time, and through this repetition they come to matter quite dramatically. As we grappled with new materialisms and worked our way through this book, we came
to notice these differences in new ways and consequently, continue to grapple with the concept of difference and its implications for feminist thought and for the lived lives of individuals. Indeed, new materialist theory encourages us to attend to the specificities through which differences emerge, and to rethink how these differences are implicated in the knowledge production processes and the knowledges that emerge (Barad, 2007).

**Lines of Flight: Overview of the Book**

This book is not offered as the definitive text on new materialisms written with the aim of instructing the reader on how to conduct feminist new materialist scholarship on moving bodies. Rather, it seeks to make the theoretical, conceptual, and methodological possibilities of new materialisms accessible to a wide range of readers, to open the door into feminist materialisms with evocative, lively examples from our own works. With this aim in mind, it is structured to include conceptual and empirical chapters in order to introduce and elaborate the major concepts and assumptions of new materialisms, the methodological implications of these assumptions, and to provide examples of how these concepts might be mobilized in research processes and practices. The remainder of this book consists of six chapters. Each chapter thus follows a similar structure, starting with key topics and debates within the field(s), before outlining and illustrating how feminist materialist approaches might encourage us to explore new lines of flight.

As Dolphijn and van der Tuin (2012) remind us, thinking with new materialisms must exceed describing its tenets and requires putting theoretical concepts to work through performative thinking practices. In Chap. 2 we discuss the challenges, opportunities, and considerations of putting new materialist theory into practice in empirical research. In this chapter we engage with literature from across a range of fields to provide an overview of the many ways that new materialisms is informing the research process and methodology, methods, and researcher positionality. We begin by elaborating on how the onto-epistemology of new materialisms encourages alternative approaches to the research process. Following
this, we map out some of the diverse ways that scholars are reengaging and reimagining research methods, including media analysis, interviews, participatory methods, autoethnography, arts-related methods, embodied and movement-based research practices, and transdisciplinary and mixed methods. We conclude this chapter with a discussion of how new materi-alist theory encourages new questions and considerations in relation to the practices and politics of researcher reflexivity, positionality, and ethics.

Chapter 3 examines the mundane and often taken-for-granted objects that are a part of sporting cultures. To date, scholars have explored the ways objects become embedded with meaning within sporting cultures. In particular, feminist scholars have shown the ways objects contribute to the development of gendered identities and work to reinforce traditional feminine traits. However, much of this work sees objects as passive item, receptacles for human meaning, rather than recognizing how sporting objects are lively and active. In this chapter we show how four branches within new materialisms encourage rethinking about the active role of objects in sporting cultures: Object Oriented Ontology, Actor Network Theory, Vibrant Matter, and Agential Realism. Inspired by this line of thinking, we share insights from a collaborative project in which we engaged with Barad’s theory of agential realism to think through the sports bra and recognize its lively intra-actions and entanglements with humans and nonhuman matter. The chapter ends with a discussion of how new materialisms can create space to think differently about the role of sporting objects and understandings of agency.

Continuing with the discussion around objects and new materialisms, in Chap. 4 we look towards digital health and fitness technologies and the ways in which new materialisms can contribute to theorizing human-technology relations. Similar to other chapters, we begin with an overview of existing literature and common approaches used to explore gendered experiences of digital fitness and health, specifically mobile apps and self-tracking. This is then followed with a discussion of how new materialisms can offer alternative perspectives and ways of understanding these human-technology relationships. We focus specifically on three approaches within new materialisms: Donna Haraway’s (1991, 2003) cyborg and companion species, Jane Bennett’s (2010a, 2010b) Vital Materialism, and Gilles Deleuze and Felix Guattari’s (1987) affect
theory. This leads into a case study where we use affect theory and assemblages to examine mothers’ engagements with Fitbits, following the various flows, intimacies, and affordances within these relationships. We conclude with a discussion overviewing the important contributions new materialisms can make to thinking about the ever-growing field of digital health and technology.

In Chap. 5 we challenge scholars of sport and physical culture to consider the implications of the ‘biological turn in social theory’ and, in particular, the possibilities of new materialist approaches for understanding the bio-socio-cultural complexities of moving bodies. It begins by mapping the important works of feminist and body studies scholars who have been exploring alternative non-dualistic models of feminist engagement with biology, corporeality, science, and matter. It then focuses specifically on the distinctive contributions of three feminist scholars—Lynda Birke, Samantha Frost, and Elizabeth Wilson—whose work has advanced understandings of the complex relationship between the biological and cultural, as well as a rethinking of feminist politics. In the second part of this chapter we take up Wilson’s (2015) Gut Feminism to explore a complex health condition (Low Energy Availability, LEA) affecting female athletes and exercising women. In doing so, we highlight biology as more dynamic, non-consilient and less deterministic than many sport feminists have presumed.

Building upon and extending the feminist new materialist theorizing in the previous chapter, we take up Barad’s concept of apparatus in Chap. 6 to rethink the processes, possibilities, and politics of transdisciplinary research. We begin by outlining how a Baradian inspired approach to transdisciplinarity encourages us to not only explore ways of knowing the moving body differently by working across disciplines, but more importantly to pay close attention to the processes, politics, and practices in such research. Herein we detail how thinking with the concept of apparatus can encourage scholars to examine how disciplinary boundaries are both (re)constructed and challenged when working with academics from other disciplines. To put this concept to work, we offer an example of a transdisciplinary research project focused on elite sports women’s experiences of the health phenomenon of low energy availability (LEA), with Baradian-inspired reflections on the processes of working alongside our
scientist collaborators. As this chapter illustrates, feminist new materialisms (and Barad in this context) offers conceptual tools to help us acknowledge the processes in which boundaries are lived, reinforced, and challenged within our own work, which can encourage research practices that trouble dominant apparatus and disciplinary boundaries.

In the final chapter of this book, we explore the potential of using new materialisms to think about the environment from a non-anthropocentric view. We begin Chap. 7 by providing an overview of common social science approaches to understanding the environment. Herein we summarize some of the main contributions from environmental humanities, ecofeminism, as well as Indigenous scholarship, before highlighting the ways in which new materialisms mirrors, and in some cases, extends these lines of thought. While there are various strands within new materialisms, herein we focus on the important contributions of two leading feminist scholars, Donna Haraway and Rosi Braidotti, who have been particularly instrumental in advancing our thinking about human-environment relations. This is followed by a more specific review of research on sport and the environment, and particularly the work of critical sport scholars who are drawing upon new materialist theories to think differently about sporting bodies and the environment. The second half of this chapter then explores the challenges of representation in new materialisms. Taking inspiration from those who are embracing performative approaches to represent some of the complexities enabled through new materialisms, we share insights into our collaborative and creative writing practices during the Australian bushfires and COVID-19 pandemic of 2020. In sharing two pieces from our collaborative ‘poetic inquiry,’ we attempt to show (rather than tell) how new materialisms affected our very being and understanding of living and moving bodies as always entangled with the environment during times of deep personal and collective challenge. We conclude with some reflections on how such new materialist and postqualitative approaches enabled new noticings, vital respondings, and thus feminist ethics and response-abilities.

Leaning further into the postqualitative calls for alternative, performative, creative modes of representation, we conclude the book with an epilogue that shares some reflections on the feminist new materialist...
collaborative process of writing this book. This is accompanied by a visual montage (inspired by the feminist DIY genre) of the many human and nonhuman entanglements that comprised our journey of writing, thinking, and moving together across time and space.

In sum, across the six chapters of this book we draw upon a range of theorists to explore the dynamism of the body as a material-discursive entity. Traversing disciplines, we put the writings of feminist scholars such as Karen Barad, Elizabeth Grosz, Jane Bennett, Elizabeth Wilson, and Rosi Braidotti to work to examine women’s moving bodies across a range of contexts (i.e., sport, fitness), ages, and life stages. While these thinkers assemble from eclectic foundations and backgrounds, together they provide theoretical and methodological tools to advance the latest debates about, and knowledge of, the sport-health-gender nexus while also contributing new theoretical, methodological, and empirical insights across multiple fields. Together, the chapters reveal some of the many ways moving bodies are entangled with objects, technologies, biologies, environments, and processes of knowledge production.

We recognize that some of the main criticisms of new materialisms are the language is evocative but too obtuse, the concepts are rarely put to empirical work, and the theories are impenetrable for many postgraduate and emerging scholars. Thus, a key motive underpinning the structure of the chapters and the book overall, is to make new materialist theories and concepts accessible to those students and academics looking to push theoretical and methodological boundaries. Each chapter follows a similar structure in that we seek to locate the reader in familiar terrain before introducing and explaining how new materialist concepts build upon and extend contemporary ways of knowing moving bodies. Later in each chapter we offer a case study to illustrate how the theoretical concepts can be put to work in innovative ways to examine gendered moving bodies across diverse social, cultural, and physical spaces. At the end of each chapter, we then offer some ‘pedagogical possibilities’ (or teaching toolboxes) as prompts for imagining how new materialist concepts might be incorporated into our teaching (at undergraduate and graduate level). Ultimately, this book is intended as a ‘lively introduction’ to new
materialisms. It is written with the aim to open up the theoretical toolbox of feminist new materialisms, so that others can dive in and use what is needed to respond and intervene in the quickly changing world around us. We write with the hope that others will join us on this journey to explore the possibilities of feminist new materialisms for reimagining moving bodies entangled in more-than-human worlds.