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Moving bodies beyond the social/biological divide: toward theoretical and transdisciplinary adventures

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In this paper I call for ‘new forms of thinking and new ways of theorizing’ the complex relations between the biological and social in sport and physical culture. I illustrate the inseparability of our biological and social bodies in sport and physical culture via the case of exercise and female reproductive hormones. Inspired by feminist biologists and philosophers of science such as Lynda Birke and Elizabeth Grosz, I describe my current research project in which I am seeking to create space for female exercisers’ (as distinct from female athletes) voices about their embodied experiences of exercise-associated amenorrhea. I offer reflections from my ongoing study and reveal a number of dilemmas that emerge as I consider how we might bring biology—and particularly hormones—back into conversations about women’s moving bodies in non-reductionist and non-determinist terms. I conclude by advocating the need for more transdisciplinary approaches to help us move toward more multidimensional understandings of the body in sport and physical culture.

Keywords: Biology; Sociology; Bodies; Transdisciplinary; Women; Exercise

The body is currently a ‘hot topic’ in the sociology of sport, movement culture and physical education (e.g. Hargreaves & Vertinsky, 2007; Evans et al., 2009; Woodward, 2009; Kennedy & Markula, 2011; Barbour, 2011). In my recently published book, Snowboarding Bodies in Theory and Practice, I attempt to contribute to contemporary debates surrounding the body and embodiment via a multi-theoretical analysis of snowboarding bodies (Thorpe, 2011). I draw upon various critical sociological approaches and theoretical perspectives, including cultural memory studies, Marxist political economy, post-Fordism, Foucauldian theorizing, Pierre Bourdieu’s theory of embodiment, feminism, sociology of mobilities and non-representational theory, to offer an analysis of boarding bodies as historical, material, mediated, symbolic, gendered, traveling, sensual, interacting and political. I argue that critically employing an array of theoretical approaches in conversation with the empirical evidence helps me paint a fuller, more complete picture of snowboarding bodies than would be possible by focusing on one theory. Of course, this does not mean that I have sealed all the gaps.

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In this paper, I want to explore one of the ‘gaps’ that I now see as glaringly obvious in my text, that is, the biological body. The social theories employed in this project provided me with an excellent array of tools to examine the social construction of snowboarding bodies in historical and contemporary contexts; I also sought to engage with recent theoretical developments on embodiment and dedicated a chapter to exploring the lived, sensuous and affective boarding body. But, the messy insides of the snowboarding body—the bones, blood, muscles, nerves and hormones—remain hidden in this text. I do not apologize for this absence; I am a sociologist, not a scientist, and understanding what was going on inside the biological snowboarding body was not the intent of this project. But, following the publication of this book, my own body rudely reminded me of the importance of the biological. As some readers may attest, there is nothing quite like surgery or time in a hospital ward to remind us of the complex processes operating inside our bodies, beyond our sociological gaze. As is often the case, my personal experiences prompted me to ask new questions about the body, and particularly the tendency in the sociology of sport and physical culture to ignore the biological dimensions of moving bodies.

The absent biological body: crossing the social/biology divide

Biological considerations can be found in the works of classical scholars such as Marx, Parsons and Elias (see Williams et al., 2003). But, for the large part, the social sciences have omitted biology from explanations of social life. As Williams et al. (2003) argue, ‘the biological has at best served as a foil for the sociological imagination, and at worst been dismissed or denounced altogether’ (p. 2). There are, of course, good reasons for ‘past sociological distrust or scepticism regarding biology’ (Williams, 2006, p. 14). Too often, ‘recourse to the biological’ has ‘served dubious ends’, legitimizing genocide, legitimating inequality and limiting freedoms, particularly those of women, children and other ‘marginalized’ groups (Williams, 2006, p. 14). And, as we are well aware, biological explanations have been used (often far too successfully) to support inequalities in sport and exercise based on race, gender, sexuality, class and age (e.g. Vertinsky, 1987, 1990, 1994). It is not surprising then that a wide variety of scholars, including sport sociologists and historians, have been extremely wary of biological explanations and reducing bodies to biological determinants (Birke, 2003; Fausto-Sterling, 2003).

However, as public fascination and academic inquiry into the body and embodiment continued to grow during the 1990s and 2000s, scholars such as Elizabeth Grosz, David Howes, Brian Massumi, Elspeth Probyn, Chris Shilling, Nigel Thrift and Bryan Turner have been calling for renewed attention to the ‘interaction between the social, the emotional, and the bodily physiology’ (Newton, 2003, p. 35). The recent turn to affect has further propelled scholars to ‘re-imagine the relationship between cultural theory and science’ (Papoulias & Callard, 2010, p. 29). Some argue that the popularity of social constructionist explanations of the body, and particularly Foucauldian-inspired analyses of the discursive body, over the
past two decades has further reinforced the social/biological divide, rendering ‘a biological and corporeal sense of the body “theoretically elusive”’ (Kelly & Field, 1996, p. 34). According to feminist biologist, Lynda Birke (1999):

while recent sociological and feminist theory has made enormously important claims about the processes of cultural inscription on the body, and about the cultural representation of the body, the body that appears in this new theory seems to be disembodied—or at the very least disembowelled (p. 2)

The omission Birke (1999) is referring to here is the ‘inside of the body as organs and physiological processes’ (p. 2).

In response to such concerns, sociologists of the body and health and illness, such as Ted Benton (1991), Michael Bury (1997), Peter Freund (1988), Chris Shilling (1993) and Simon Williams (1996, 1998), are attempting to ‘rethink the relationship between sociology and the biological sciences’ (Bury, 1997, p. 199), by ‘marrying’ the biological and the social in a ‘truly embodied fashion’ (Williams, 2006, p. 13). In so doing, material corporeal sociologists (as they have become known) are making major contributions in linking health and illness with ‘wider structures of power and domination, civilisation and control in society’ (Williams, 1998, p. 131). Newton (2003) acknowledges material corporeal sociologists as ‘adventurers’ with ‘a noble purpose’ (p. 20), but this is not to deny problems. Some sociologists have resorted to uncritical positivism, whereas others have been accused of ‘strange borrowings’, ranging from highly selective and decontextual appropriations to erroneous interpretations of theories, concepts and findings from the biological and psychological sciences (Papoulias & Callard, 2010, p. 29). These problems remind us of the need to tread warily. With Newton (2003), I am concerned that ontological and epistemological differences between the natural and social sciences make ‘marrying’ the biological and the social a treacherous activity indeed. The challenge now is how to move beyond this ‘starting point’ (Shilling, 1993) to develop more sophisticated approaches that recognize the complexities of the interaction between the biological and sociological dimensions of the moving body. There are various ways of approaching this challenge ranging from Pierre Bourdieu’s concept of habitus to Gilles Deleuze’s discussion of the three dominant groups of strata, but here I am particularly interested in the efforts by some feminist scholars to engage biology in new ways.

Feminist theory and the biological body

Given centuries of oppression based upon essentialist biological arguments, it is hardly surprising that Western feminists have had an ambivalent relationship with biology. Feminists during the 1970s and 1980s ‘critiqued crude biological determinism—which is so contrary to the possibilities of change—and advocated that gender and sexuality are socially constructed’ (Birke, 2003, p. 40). Feminist historians and sociologists of sport also rejected pseudo-scientific essentialist biological explanations used to support discriminatory practices and exclusionary
discourses (Vertinsky, 1987, 1990), instead focusing on the various forms of structural, cultural and symbolic forces influencing the construction of gender in sport. Such approaches were politically necessary at the time and helped forge new spaces for women in sport and physical activity.

More recently, post-structural feminists, engaging the ideas of philosophers such as Deleuze (cf. Grosz, 1995; Bray & Colebrook, 1998; Markula, 2006), have helped us ‘transcend concepts of the bounded body and self by insistence on corporeal fluidity and flow’ (Birke, 2003, p. 46). According to Birke (2003), this work prompts us to think about ‘the body as process(es) rather than fixed […] as existing in, and part of, a nexus of forces, moving through the world and co-creating it’ (p. 46). Yet, she laments that the biological processes of the body’s insides continue to be downplayed in most feminist theorizing. As Birke (2003) argues, we need to pay attention to both ‘how social and cultural forces do indeed write upon the body as surface’ and how these forces ‘communicate with the body’s inside’ (p. 46).

In response to such concerns, a number of feminist scholars are working to bring the biological body (back) into feminist theory in important ways. Examples include Donna Haraway’s (1991) deliberations on the immune system and the biopolitics of postmodern bodies, Anne Fausto-Sterling’s (2000) critical reflections in Sexing the Body and Elizabeth Grosz’s (1994) corporeal feminism. In so doing, feminist scholars are helping us ‘think differently about biology, culture, sex, and gender’ (Fausto-Sterling, 2003, p. 124). It is important to note that feminist historians and sociologists of sport and exercise, such as Jennifer Hargreaves and Patricia Vertinsky (2007) and Pirkko Markula and Eileen Kennedy (2011), have acknowledged the importance of the biological body. Yet, the voices of female athletes and exercisers about the biological dimensions of their experiences continue to be marginalized in most socio-cultural scholarship.

Since the late 1990s, feminist biologists have become increasingly instrumental in ‘demanding a more nuanced view of “the biological” in [feminist and] social theory’ (Birke, 2003, p. 46). In Feminism and the Biological Body, for example, Birke (1999) integrates biological science and feminist theory in ways that include, rather than deny, our fleshy bodies. Concerned by the social constructionist tendencies in feminist and sociological theory to view the surface of the body as ‘endlessly malleable’ while the ‘inner body remains pre-social, foundational’, fixed and passive (Birke, 2003, p. 41), she encourages us to rethink the relationships between the biological and social by focusing on ‘transformation and change, rather than fixity and determinism’ (Birke, 1999, p. 154). In advocating a new, more dynamic approach to the biological, Birke (1999) argues that we need to ‘begin to develop a view of the body which attempts to put biological processes into their social context, yet which retains organismic agency and integrity’ (p. 173). She recognizes this as a somewhat abstract and ‘difficult intellectual task’ (Birke, 1999, p. 173) but offers us a potentially fruitful way forward via her adaptation of Elizabeth Grosz’s (1994) psychoanalytic interpretation of the Möbius strip. According to Birke (1999), the Möbius—a continuous figure-eight strip joined so that outside becomes inside—might
also be used to help us rethink the relationship between the inner, physiological body, and the outer, social body; ‘they are coterminous, not separable’ (Birke, 1999, p. 174).

Now, a growing number of feminist scholars are building upon Birke’s (1999) dynamic approach to the biological and engaging the scholarship of ‘new materialist’ feminist theorists (e.g. Butler, 1993; Barad, 1998, 2003; Mol, 2002) and/or developmental systems theory (see Meynell, 2008), to produce fascinating investigations of sex hormones, and more recently pheromones, that directly challenge ‘the dualisms of culture/nature, sex/gender, science/humanities’ (Roberts, 2003; Hird, 2004; Squier & Littlefield, 2004; Sieben, 2011, p. 264). Authors such as Fausto-Sterling (2000), Oudshoorn (1994) and Roberts (2002, 2003, 2007), for example, have offered lucid analyses that demonstrate the extent of the ‘entanglement of heteronormative discourses... with hormonal realities’ (Sieben, 2011, p. 264) via an array of cases ranging from sex testing at the Olympic Games, to hormone-replacement therapies, to the effects of the increase of ‘environmental estrogens’ on men and women’s sex hormones. Feminist scholars in disability studies are also working to help dismantle the biology-culture dualism. For example, in Sociologies of Disability and Illness, Thomas (2007) advocates a non-reductionist materialist ontology as necessary for understanding (dis)abled bodies as simultaneously biological, material and social.

For Birke (1999), engaging with the biological body has important political implications. She argues that, while feminists ‘must certainly reject’ the kinds of biology that have been used as ‘an excuse for discriminatory practices, and exclusionary discourses’, ‘rejecting biological processes altogether by ignoring or omitting the biological body does not help’, but rather serves ‘indirectly to reinforce biological determinism’ and ‘marginalise the embodied experience of those whose voices are not heard in science’ (Birke, 1999, p. 175; also see Asberg & Birke, 2010).

Arguably, feminist sociologists of sport and physical culture have ignored the biological dimensions of women’s moving bodies for too long. In so doing, we have marginalized the embodied experiences of those we proclaim to care so much about. Inspired by post-structural feminists and philosophers of science, such as Lynda Birke, Elizabeth Grosz, Celia Roberts and many others, I recently set out on a new research journey with the aim to create space for women’s voices about their experiences of exercise and hormones, and particularly exercise-associated amenorrhoea. In the remainder of this paper, I briefly summarize the relationship between exercise and female reproductive hormones, and consider how we can bring biology—and particularly hormones—back into conversations about the body in sport and physical culture in non-reductionist and non-determinist terms. I conclude by advocating the need for more transdisciplinary approaches to help us move toward new understandings of the moving body.

Rethinking the biological/social divide: the case of amenorrhea in female exercisers

Women across the western world are participating in sport and exercise in record numbers. While the social, psychological and physical health benefits of regular
physical activity have been widely disseminated, rigorous exercise is also associated with a unique set of risks for women. In 1992, the American College of Sports Medicine coined the term the Female Athlete Triad to illustrate the three separate but interrelated risks of amenorrhea (delayed onset or loss of menstrual cycle among reproductive age girls and women), bone mineral loss and disordered eating, which can have long-lasting consequences for women’s reproductive and bone health.

The reproductive ‘abnormalities’ observed in athletic women generally originate as hypothalamic ‘dysfunction’ and disturbance of the gonad-o-tropic-releasing hormone (GnRH). The disturbance of the GnRH pulse generator then limits pituitary secretion of luteinizing hormone and follicle-stimulating hormone, which, in turn, limits ovarian stimulation and estradiol production (Warren & Perloth, 2001; Williams & De Souza, 2006). The clinical consequences associated with suppression of GnRH among female athletes and exercisers are said to include ‘infertility and compromised bone density, which appears to be irreversible’ (Warren & Perloth, 2001, p. 3). Research has shown considerable variation of the risks of the Female Athlete Triad across sports, with aesthetic activities such as ballet, and weight-bearing sports such as long-distance running, showing the highest prevalence (De Souza et al., 1994; Beals & Manore, 2002; Birch, 2005; Harber, 2011). There is a significant body of literature on the health concerns for elite female athletes, but recent research suggests that everyday women engaging in regular exercise for health and fitness may face similar risks.

Since the fitness boom of the 1970s, women have been bombarded with social messages that ‘exercise is good for you’ and ‘the more the better’, prompting some to engage in regular, and sometimes vigorous, exercise regimes, often alongside restricted diets (Bordo, 1993; Duncan, 1994; Markula, 1995; Maguire & Mansfield, 1998; D’Abundo, 2009; Dworkin & Wachs, 2009; Kennedy & Markula, 2011; McDermott, 2011). Few of these women define themselves as athletes or consider their exercise practices particularly excessive, but they may be exposed to some of the same risks of the Female Athlete Triad (Wheatley et al., 2012). Kinesiologists have shown that approximately half of exercising women (those who perform regular, purposeful exercise, greater than 55% of maximal heart rate, for more than two hours/week) experience subtle reproductive disturbances, and one-third present with severe menstrual disturbance or amenorrhea (De Souza et al., 2010). Another study suggests that up to 46% of ‘recreational runners’ may present with amenorrhea (De Souza et al., 1998). For De Souza et al. (2010), ‘heightened awareness among physically active women and raising awareness among athletic trainers, coaches, physical therapists and other health care professionals about the Female Athlete Triad is essential to promote healthy exercise practices among girls and women’ (p. 502). Similarly, Wheatley et al. (2012) proclaim that the growing rate of secondary hypothalamic amenorrhea among young physically active women should be considered a ‘public health issue’. Continuing they argue that, in this context, the term Female Athlete Triad has become misleading—it is ‘inexact and over-specific’—and revisions are necessary to reflect the extent and depth of this ‘health condition’ among young female athletes, recreational sport participants and regular exercisers.
Researchers in the biomedical sciences are increasingly employing an array of methods to investigate the relationships between exercise and reproductive hormones. Broadly, the research reveals considerable variation among female exercisers. The prevalence and extent of menstrual irregularities varies with the type of physical activity and exercise load (intensity and duration), as well as body composition. While it is widely accepted in the professional and clinical communities that women with a low body mass index and restricted caloric intake are more susceptible to exercise-associated amenorrhea (De Souza et al., 2008), researchers and medical professionals observe considerable differences among women with similar exercise loads, body composition and diets, thus prompting some to consider the influence of other factors such as genes, personality types and life stress (Milsom, 2011, personal communication; also see Armstrong, 1986; Williams et al., 2001; Williams & De Souza, 2006). Scientists are gaining a better understanding of the complex relationships between exercise training, body composition, nutrition and perturbations of menstrual cycle function, yet there is still some uncertainty as to the full extent of the long-term effects to women’s bones and reproductive systems.

Despite some early inconsistencies and ongoing uncertainties, the endocrinological research continues to evolve, offering ever new insights into the complex relationship between women’s exercise practices, caloric intake and hormonal and reproductive systems. Somewhat surprisingly, however, this purported ‘public health issue’ is rarely examined (critically or otherwise) in professional, public and research texts beyond a few relatively obscure endocrinological and physiological journals. Thus, in my latest project, I am critically examining the social silences surrounding exercise-associated amenorrhea, as well as female exercisers’ (as distinct from female athletes) lived experiences of their biological bodies. I am still in the early stages of developing this study, and I must admit it feels somewhat risqué to bring biology, and particularly reproductive hormones, into a conversation about physically active female bodies. I recognize that there is a real dilemma for feminists here; on the one hand, we must take issues of women’s health seriously, but on the other, ‘we do not want to renew deterministic accounts, however covertly’ (Birke, 2003, p. 44). Such an approach may be controversial for some feminists and sociologists of sport. But I do not believe we can begin to understand this phenomenon without acknowledging the inseparability of women’s exercise practices and biological functioning, while also recognizing that there are many other social (e.g. media, peer group, medical ‘knowledge’, broader health discourses) and psychological (e.g. body image, exercise addiction, personality) factors that influence women’s relationships with their moving bodies.

According to Birke (1999), sociologists of the body need to better integrate their own bodies into their own research projects: ‘Just as those who are white are never called upon to situate ourselves in academic work as white, so theorists of the body are never called upon to situate themselves as embodied’ (p. 175). Thus, here I offer an excerpt from a seminar delivered to the University of Alberta, Faculty of Physical...
Education and Recreation in late 2011, in which I experimentally (and nervously) situated myself in this project:

Over the past six or seven years, I have developed a deep love of running, gradually increasing my (typically) daily runs from 30 minutes to 45-60 minutes, sometimes longer. My burgeoning joy of running seemed to develop alongside my career in which I now spend the bulk of my days sitting at a desk. After long periods in front of the computer, my back and shoulders begin to ache and my legs twitch in anticipation of movement. Over time, I grew to desire the rhythmic flexion and extension of my limbs, the breath in my chest, and the breeze on my skin. Running helps me clear my mind, and gain some clarity and perspective on issues of the day; it also gives me a sense of connection to the people and places in which I live or temporarily reside. Sitting back at the computer after a long run, my body may be fatigued but I feel refreshed and enthused to revisit the words on the screen.

When my monthly menstrual periods slowly disappeared, I didn’t think too much of it. After a few months passed, I lost track of the ‘cycles’, and to be honest, I didn’t really miss the monthly interruptions. Many of my fellow physically active friends had similar experiences and told me not to worry, supposedly ‘it’s normal when you’re running most days’. For a while, I accepted their explanations. I felt great—I seemed to embody ‘good health’. Yet I also had a growing sense of unease—it just didn’t seem ‘natural’ or ‘normal’ to me. So, I followed up on my niggling uncertainties with a couple of doctor visits. But I became increasingly frustrated when doctors in both New Zealand and the UK dismissed my concerns; a doctor in England told me I was ‘very healthy…it’s probably just a bit of stress from moving overseas’, and two doctors in New Zealand also told me it was nothing to worry about. I was disappointed by their apathy and seemingly simplistic understandings of ‘health’—whereas an ‘obese’ body is a sign of instant alarm, I wanted them to respect my concerns about the internal functioning of my visibly ‘fit’ and thus supposedly ‘healthy’ body.

The more research I did, the more concerned I became about the health of my bones and future fertility, so I followed this up with a series of blood tests to measure my hormones. Rather than accepting the medical ‘experts’ advice to use the contraceptive pill or other drugs to artificially trigger menstruation, I forced myself to run a little less and eat a little more. Somewhat ironically, I started policing my own running practices; when I pushed away from the desk, tied my laces and stepped out the door for my daily run, I was disciplining myself, ‘you are only allowed to run for 35 minutes today’. Throughout the run I would worry what it was doing to my progesterone and estrodiol levels, and the longevity of my bones. I no longer felt good upon returning from a long run, rather I felt guilty. Over time, it became easier, and with a bit more weight and a little less exercise, my regular menstrual cycles returned.

However, it was through my own experiences—my conversations with doctors, female friends, and browsing on forums dedicated to running women’s experiences of amenorrhea—that I came to the realization that I am not alone. In fact, I was surprised to find a plethora of conversations on running and exercise websites among female exercisers expressing their fears and confusion about their exercise practices and menstruation, and offering advice and support to other women; some of these threads contained hundreds of posts! Perhaps not surprisingly though, these conversations almost always take place behind ‘closed doors’, obscured
behind many layers of web pages. As a feminist sociologist, I want to explore this issue further and develop more nuanced understandings of how exercising women make meaning of the biological dimensions of their moving bodies.

Importantly, this project is not about my body. But, working within the post-structural paradigm, I recognize the value of reflexive and embodied research (e.g. Olive & Thorpe, 2011), and thus will continue to reflect on how my own bodily experiences inform my research practices and politics. Rather than having a negative effect on my research—compromising my ‘objectivity’—I argue that my experiences, if engaged reflexively, have the potential to inform this project by helping me identify key issues and develop rapport with participants. Moreover, if I expect women to share their lived experiences of exercise-associated amenorrhea with me, I need to understand the difficulties of articulating such experiences. Also, as I speak my own experiences into (carefully selected) public spaces and pay attention to the bodily responses of others (e.g. eye gaze, body language, tone of voice), I am gaining a greater understanding of the stigma surrounding women’s biological bodies that continues to play an important part in the social silencing of the relationship between exercise, hormones and amenorrhea. Speaking of my own experiences and connecting them to broader issues of power/knowledge is part of my own feminist politics.

Seeking to create space for exercising women’s voices—their pleasures, fears, concerns and confusions—my research will include semi-structured interviews with recreational female runners who have experienced some form of menstrual disruption as a result of their exercise practices. During face-to-face semi-structured interviews, participants will be encouraged to express their attitudes, ideas and perceptions about exercise, hormones, menstruation, bone density and reproductive health, food and eating, body image, and their experiences with medical practitioners and/or any medical tests, diagnoses or treatments relating to exercise-related amenorrhea (Malson & Ussher, 1996). I will also conduct interviews with medical and exercise professionals (e.g. gynecologists, physiologists, psychologists, nutritionists, personal trainers) about their understandings of exercise-associated amenorrhea and interactions with female exercisers as patients or clients. To further understand how information about the potential risks of exercise is being circulated in society, and how female exercisers are actively and passively consuming (and producing) this knowledge, I will also analyze an array of print (e.g. women’s lifestyle and exercise magazines) and online media (e.g. blogs, websites).

I have yet to decide which theoretical approach will be the most useful for analyzing the empirical evidence gained from interviews and media analyses. Based on my theoretical experiences and ongoing adventures with various critical theories, however, I recognize the potential (as well as the limits) of Michel Foucault and Pierre Bourdieu’s work for helping me reveal the multiple forms of power operating on and through women’s moving bodies (Thorpe, 2011). Adopting a Foucauldian approach, for example, could help to reveal the power of contemporary health discourses, as instances of ‘bio-power’ (Foucault, 1978), to ‘normalize and control’ some women’s certain reproductive behaviors around exercise, consumption, food and diet (Evans et al., 2009, p. 393; also see Bunton & Petersen, 1997;
Jutel, 2005; Wright & Harwood, 2009). In particular, the Foucauldian notion of discourse might illuminate some female exercisers as internalizing neoliberal discourses of individual responsibility, and the body as an asset to be manipulated and controlled in a highly competitive and individualistic society (Foucault, 1981; Heywood, 2006; Markula & Pringle, 2006). Furthermore, Foucault’s concepts of power/knowledge may help me critique some of the dominant medical discourses surrounding women’s changing menstrual cycles as a ‘dysfunction’ or ‘disorder’ requiring medical treatment or ongoing surveillance. In so doing, I will build upon the growing body of literature on the phenomenon of ‘biomedicalization’ (Clarke et al., 2003). I am also interested in exploring the politics of diagnosis (Jutel, 2011), and examining how women come to think differently about their moving bodies when the ‘panoptic gaze’ is operating upon both the surface and the insides of their bodies via invasive medical technologies.

The Foucauldian notion of exclusion is also important when considering who is authorized to ‘speak’ about women’s hormonal changes in response to exercise. Thus far, it has been doctors and researchers in the biological sciences that have defined and diagnosed exercise-associated amenorrhea. Female exercisers, on the other hand, are rarely given the opportunity to discuss these issues, whether they are concerned about the risks of amenorrhea or not. Alternatively, adopting a Bourdieusian approach, particularly the concept of habitus (Bourdieu, 1990, 1992), may facilitate insight into why young, high achieving middle-class and professional women seem to be particularly susceptible to exercise-associated amenorrhea (Milsom, personal communication, 11 October 2011; Shadwell, 2011). Bourdieu’s concept of field might also prompt me to consider how women make meaning of the different rules, norms and knowledge surrounding the exercising body within and across various fields, such as the medical field, sports teams, a recreational running group and/or educational settings, such as a kinesiology program (Hills, 2006; Thorpe, 2011).

Following each of these theoretical strands, we might see the effects of dominant structures on both the surface and insides (i.e. reproductive hormones, bone density and psychology) of women’s bodies. There is a danger when adopting more structural social theoretical approaches, however, that the female exercisers themselves become marginalized, they are assumed to be dupes to dominating discourses, largely unaware of the risks of osteoporosis and fertility associated with excessive exercise and diet restrictions. My recent conversations with medical practitioners and female runners, and reading of women’s running websites and personal blogs, however, suggest that not all women are duped by dominating discourses. According to one fertility specialist, some women are rejecting advice from medical ‘experts’; and instead are seeking knowledge from various sources such as websites and blogs and are attempting to control their biological functioning via the careful manipulation of their exercise behaviors, eating practices and consumption of various medical products and reproductive technologies. During our conversation, the specialist explained:
I’ve got patients who’ve been had amenorrhea for years, and only decide to go to a reproductive gynaecologist when they want to pregnant. And yes, they are given Clomiphene and other reproductive treatments, and many of them do eventually conceive. In the fertility world, we can overcome most of these defects, but physiologically I just don’t believe we should […] But nobody seems to listen to doctors anymore! Well, I should put that another way, no one seems to listen to doctors like me anymore. They [women] are taking the easier option and using reproductive drugs rather than changing their lifestyles by simply exercising and dieting less (personal communication, October 2011).

Returning to Birke’s (1999) notion of the Möbius, such comments point to the complexities of the relationship between women’s biological and social bodies; some women seem to be viewing both the surface and the insides of their bodies as malleable. Some women are seeking to control the surface of their bodies via highly disciplined exercise and dieting practices, as well as their internal, biological functioning via the use of reproductive drugs or alternative medicine (e.g. acupuncture, Chinese herbal medicine). Such observations also seem to support Rose’s (2007) argument that, rather than entering a period of ‘new biological and genetic determinism’, we are seeing the emergence of a ‘novel somantic ethics’ in which our ‘corporeal neurochemical individuality’ is being ‘opened up to choice, prudence, and responsibility, to experimentation, to contestation, and so to a politics of life itself’ (p. 8). Drawing upon Rose’s (2007) work, I am interested in exploring the ‘somantic ethics’ of female exercisers who have the opportunity to develop new knowledge (if they so choose) about how their bodies respond to exercise via a variety of medical technologies (i.e. blood tests, urine samples, internal ultrasounds).

In my current project, I am dedicated to creating space for women’s voices about their experiences of their social and biological bodies, and will engage critical social theory to help me identify and explain some of the various forms of power operating on and through women’s bodies. But, in their extensive work on young women, eating disorders and education, Evans et al. conclude that ‘all theoretical approaches’ were ‘found wanting’ (Evans & Davies, 2011, p. 264): ‘it seems we have yet to develop a theoretical approach that can explicitly trace the visceral effects of dominant discourses on women’s biological bodies, while also recognizing their potential agency to make meaning of, and even resist, some bio-pedagogies’ (Evans et al., 2009, p. 402). As various scholars attest, it is very difficult to ‘know’ or interrogate the biological dimensions of the body, ‘at least with the conventional sociological toolkit’ (Newton, 2003, cited in Evans et al., 2009, p. 402).

As a critical sociologist with an intimate relationship with social theory, I certainly will not be ‘giving up’ on our sociological tools. Indeed, I see much potential in the work of Foucault, Bourdieu, Deleuze and post-structural feminists, for exploring the social, psychological, affective and biological dimensions of female exercisers’ experiences of menstruation (or the lack-thereof). According to some sociologists of the body, however, existing social theories are limited in their ability to truly recognize the biological as a ‘complex and multi-layered domain’ (Williams, 2006, p. 17). Evans et al. (2009), for example, argue that the ‘new challenge’ for understanding body politics and pedagogies is ‘not just one of doing better
Moving bodies beyond borders: imagining transdisciplinarity

Research funding councils in many countries are actively encouraging academics to work across the disciplines to produce research that seeks to better serve society. As a result, we are increasingly seeing the emergence of new inter-multi-transdisciplinary projects (e.g. the Havard Transdisciplinary Research in Energetics and Cancer Center or the Penn State Center for Childhood Obesity Research). It is beyond the scope, and not the intent, of this paper to evaluate such projects, summarize debates regarding the potential and perils of intra- and inter-disciplinary border crossings (see Wickson et al., 2006; Kessel & Rosenfield, 2008; Evans, Forthcoming) or comment on politics within the field of health research more broadly (see Rail et al., 2010). Rather, here I build upon the recent work of Evans et al. to argue that transdisciplinarity may help us develop more multidimensional understandings of moving bodies in sport and physical culture.

It is important to note that some critical sport scholars have adopted interdisciplinary approaches to examine the biological and/or psychological dimensions of particular sporting experiences. For example, sport historian Douglas Booth (2009) draws upon physiological and socio-psychological research to explain the affective experience of ‘stoke’ in surfing and other so-called extreme sports; and sociologist Lee Monaghan (2003) adopts an interdisciplinary ethno-scientific approach to offer a fascinating analysis of the social significance of biology in the relationship between bodybuilding, steroids, hormones, moods and behavioral effects. In contrast to interdisciplinary research in which a scholar (or group of researchers) steps outside his or her disciplinary boundaries to approach an issue ‘from a range of disciplinary perspectives’, ultimately integrating aspects from the various approaches to ‘provide a systematic outcome’ (Lawrence & Despres, 2004, p. 400), transdisciplinarity calls for a ‘research attitude’ in which ‘members of a research team arrive with different disciplinary backgrounds and often different agendas’ yet are ‘sufficiently informed about one another’s perspectives and motivations to be able to work together as a collective’ (Davis & Sumara, 2008, cited in Evans & Davies, 2011, p. 265). Transdisciplinarity is not a call for the dissolving of disciplinary borders, but rather an attempt to create new spaces for respectful and productive conversations and collaborations with scholars from various disciplines. Members of transdisciplinary teams are encouraged to speak from their disciplinary field and share their expertise and insights with the group, as well as listen to, learn from and engage in discussions (and perhaps debate) with, scholars from other disciplines; they do so with the intent to produce more complex, nuanced and multidimensional understandings of the subject under investigation. Put simply, transdisciplinarity refers to a dialog with scholars from the social and physical sciences ‘in the interests of better addressing sociological theory or method’, rather we need to actively pursue ‘different relationships between the “academic” disciplines in order to throw light on the complexities and nuances of biology in culture and the workings of the corporeal device’ (p. 403).
substantive interests that are of shared concern’ (e.g. cancer prevention and treatment, childhood obesity, disordered eating) (Evans & Davies, 2011, p. 265).

Of course, not all scholars working in the biological or social sciences and humanities possess a ‘research attitude’ of openness to other ways of knowing or producing knowledge. Indeed, some researchers working in positivist, post-positivist, interpretivist, critical and post-structural paradigms remain highly defensive of their preferred theories, concepts, methods and representational styles, and seem unwilling to consider the potential of different ways of knowing the world, or indeed, ‘their’ subject. Thus, transdisciplinary research groups need to be carefully selected with invitations extended to those who are reflexive of their personal ontological, axiological and epistemological assumptions, and the strengths and limitations of their disciplinary field, and most importantly, to those who recognize the potential in other ways of thinking about the subject under investigation. While acknowledging the ‘political and epistemological difficulties of transcending disciplinary boundaries’ (Evans & Davies, 2011, p. 265; also see Dölling & Hark, 2000; Magill-Evans et al., 2002; Austin et al., 2008; Evans, Forthcoming), I also recognize the potential value of transdisciplinarity for helping us cross the social/biological divide, and developing more multidimensional understandings of moving bodies, including women’s experiences of exercise-associated amenorrhea.

There are no clear guidelines on how to develop a transdisciplinary project. It seems logical, however, to begin by developing an intimate understanding of the types of information being produced within various fields. Thus, before inviting any potential collaborators, I set out to become ‘sufficiently informed’ about other ways of knowing exercise-associated amenorrhea. I began by conducting a preliminary review of relevant literature in the fields of medical sociology, feminist theory, endocrinology, physical education, sport and exercise psychology, physiology, sociology and history. In so doing, I was familiarizing myself with the different types of research questions being posed, the dominant methods, theories, concepts and jargon being employed and some of the key findings produced, within each field.

Reading across the disciplines is a valuable activity, but, admittedly, my ability to thoroughly engage with some of the quantitative studies was limited. I have been teaching sport psychology for the past five years, so I can critically engage with psychological explanations of exercise dependence, eating behavior, body image and the Female Athlete Triad (Ackardd et al., 2002; Zmijewski & Howard, 2003; De Souza et al., 2006), and studies of the different mood profiles of amenorrheic exercisers (Cockerill et al., 1992), but it has been a long time since I completed undergraduate courses in exercise physiology. Moreover, some of the laboratory-based endocrinological research include formulas and equations that I struggle to truly grasp (e.g. De Souza et al., 1998; Vescouï et al., 2008); I was particularly bewildered by recent endocrinological research that examines longitudinal changes in reproductive hormones in monkeys during exercise (Williams et al., 2001, 2007). Reading across the disciplines, however, I was reminded of the value of kinesiology as a degree that introduces students to the range of disciplines across the social and biological sciences (Gill, 2007; Newell, 2007; Booth, 2009).
Admittedly, as a critical sociologist, I could not help but question some of the positivistic assumptions and decontextualized approaches adopted in many of these studies. But, as Newton (2003) warns: too often ‘sociologists are insufficiently critical in their citation of psycho-physiological work’ because ‘they lack training in such areas’ (p. 37). According to Newton (2003), ‘if we are to “truly” cross the great divide between the social and nature, then we need a more sophisticated understanding of psychology and biology. Without that, we can neither deconstruct it, nor reconstruct it’ (p. 37). Thus, recognizing my own intellectual limits in the natural or biological sciences, the next challenge is to engage scholars and practitioners from various fields in dialog on this subject.

Given the historical divisions between the biological and social sciences, opening up transdisciplinary conversations may seem an intimidating (and perhaps unproductive) pursuit. Interestingly though, even the basic knowledge acquired from my preliminary reading across the disciplines is proving valuable as I prepare for the next phase of this project. For example, during a two-hour Skype conversation with Dr Stella Milsom, an endocrinologist and fertility specialist, who has spoken publicly about the increasing numbers of women presenting with hypothalamic amenorrhea (see Shadwell, 2011), I found my newly acquired endocrinological and physiological knowledge invaluable. It helped me develop rapport with Milsom, and enabled a more fruitful dialog in which we discussed and debated some of the social, psychological and biological complexities of this topic. While I did not accept all of Milsom’s arguments at face value, our conversation certainly alerted me to an array of new issues worthy of further investigation. At the conclusion of the conversation, Milsom not only offered to invite her colleagues and clients in New Zealand and the UK to consider participating in this project, but also admitted:

> It is great hearing from a sociologist. It’s good for me to think about this issue from a different perspective. I have never done any psychology or sociology training, but now I’m thinking that it would have been much more useful than some of the things I learned at university (personal communication, October 2011).

Thus far, I have been pleasantly surprised by the enthusiasm from endocrinologists, physiologists, sports nutritionists and feminist sport historians about the potential of a transdisciplinary project on this topic; we are all intrigued by the silences surrounding this important issue, and concerned to unravel some of the complexities of this phenomenon.

Despite initial signs of optimism, I am nonetheless anticipating some ‘sticking points’ in the practice and politics of doing this transdisciplinary project. Comments from a conversation with a competitive marathon runner who admits to having amenorrhea for many years during her athletic career, and is now a sport and exercise physiologist, are prescient here:

> The more research I do on this topic, the more I recognize that the sociology and psychology are the missing links. But, sometimes when I hear sociologists talking [...] I just switch off and find myself waiting for the next fact (personal communication, October 2011).
While it is easy to scoff at such comments, I wonder how many readers ‘switched off’ in my earlier discussion on some of the physiological details of exercise-associated amenorrhea? I too struggled to stay ‘switched on’ while reading some of the denser endocrinological and physiological research during my preliminary literature review. Thus, as I prepare to open up a more formal dialog with scholars from within and across the social and natural sciences, I continue to ponder strategies for facilitating a fruitful transdisciplinary exchange on the topic of female exercising bodies, hormones and menstruation.

**Summary**

In sum, Fredrick Jameson has suggested that we ‘learn theories like languages, and explore as every good translator does the expressive gaps between them – what can be said in one theory and not another’ (cited in Leane & Buchanan, 2002, p. 254). In my previous work, I have attempted to shed light on some of the omissions in and gaps between various social theories, and highlight some areas where social theorizing of moving bodies might be advanced. In this paper, however, I identified a silence across many social theories, that is, the biological body. I argued that, for those of us interested in developing more multidimensional understandings of bodies in sport and physical culture, we need to develop ‘new forms of thinking and new ways of theorizing’ (Williams, 2006, p. 22) the complex relations between the biological and social. How, for example, might we bring hormones back into the conversation about women’s sporting bodies in non-reductionist and non-determinist terms? Arguably, feminist sociologists of sport and physical culture have ignored the biological body for too long, and in so doing, we have ‘marginalized the embodied experiences’ of female exercisers whose ‘voices are not heard’ in our scholarship or elsewhere (Birke, 1999, p. 175). Put simply, we need to ask new questions and develop ‘new forms of thinking’ about women’s physically active bodies.

Rather than interdisciplinary approaches in which sociologists attempt to ‘marry’ the social and the biological, I am imagining the value of engaging in transdisciplinary dialogs with scholars and professionals across the social and biological sciences. Of course, like any form of travel, engaging in conversations across disciplinary borders will require patience and respect for other ways of knowing and explaining the world (Steinmetz, 2007). We must also (wherever possible) choose our travel companions carefully, inviting those who are reflexive of their own ontological, axiological and epistemological assumptions, and possessing a ‘research attitude’ of both openness to other ways of knowing, as well as a deep concern to produce research that has the potential to improve the lives of those we study. While I am anticipating some bumps along the way, this journey toward transdisciplinarity (not dissimilar from my previous adventures with social theory) has the potential to help me think differently about my own and other women’s moving bodies, and hopefully create new, socially important knowledge about the relationship between exercise and reproductive hormones. Indeed, I am excited about the challenges
ahead as we move toward more multidimensional understandings of the body in
sport, physical culture, education and society.

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Notes

1. An earlier version of this paper was presented as part of the Presidential Panel—‘The
politics, technologies, and (bio)pedagogies of moving bodies’—at the North American
Society for the Sociology of Sport Conference held in Minneapolis, Minnesota (USA), 2–5
November 2011.

2. Vertinsky (1987), for example, has illustrated the ways middle-class women in the late
nineteenth century were seriously inhibited by medical ideologies. She shows how doctors
employed pseudo-scientific theories about women’s biology—about menstruation (e.g.
menstrual disability theory), pregnancy and child rearing, menopause and old age—which
had a definite effect on attitudes to women’s exercise and sport.

3. Amenorrhea can be classified as primary or secondary. Broadly, primary amenorrhea refers
to girls whose menstrual cycles have not begun by age 16 (particularly common among
gymnasts and ballet dancers), and secondary amenorrhea refers to previously menstruating
women who have an absence of menstrual periods for at least three consecutive cycles.

4. A particularly noteworthy example is the ongoing ‘Refuel: Active Women’s Study’ being
conducted by Professor’s Mary Jane De Souza and Nancy Williams in the Women’s Exercise
and Health Laboratory at Penn State University. This exciting study is examining the impact
of increased caloric intake on bone health and menstrual cyclicity in energy deficient
exercising women. For further information, see http://www.refuel.psu.edu

5. In so doing, I will draw upon the growing body of literature that critically examines women’s
experiences of running at recreational and elite levels (see, for example, Tulle, 2007; Shipway
& Holloway, 2010; Allen-Collinson, 2011).

6. Following the Presidential Panel at the North American Sociology of Sport Conference
where I first addressed this subject, a number of my highly esteemed feminist colleagues
cautionsed me (both publicly and privately) against this topic and argued for the need to
remain highly critical of any/all medical knowledge on the relationship between exercise and
menstruation. As well as raising some excellent points, their strong responses prompted me
to wonder if particular strands of feminism may also be playing a role in the silencing of
women’s voices regarding their biological bodies?

7. Interestingly, a conversation with a Canadian nurse who is also a committed member of a
local running group, and long-time confidant to many of her female running friends who
have experienced menstrual disruptions from their exercise practices, seemed to support
Milsom’s observations: ‘Lots of my running friends haven’t had periods for years, but they
don’t really care until they decide they want to start trying for a baby. Then, instead of
reducing their running or eating more, they just go to their gynaecologist and ask for the
drugs that will help them get pregnant, and for most of them, it seems to work’. Continuing,
she adds, ‘but none of them seem to worry about the damage they are doing to their bones
though’ (personal communication, 9 November 2011; emphasis in original). Women’s exercise and lifestyle websites and blogs also reveal some female exercisers resisting medical advice and seeking alternatives to traditional medicine. For example, one woman added the following post to a thread dedicated to exercise-associated amenorrhea: ‘Hey everyone, I haven’t had my period since late 2004, the gyno is attributing it to low body fat and said I need to run less and put on weight to help it come back. Like some other posters in this thread, I balked at that idea. I also know that I do not want to be put on birth control to “force” a period. Does anyone know of any alternative medicine/holistic treatments for amenorrhea? Does anyone have a knowledge of vitamins and herbs?’ (accessed 12 October 2011, from www.caloriecount.com).

8. I am grateful to my colleague Richard Pringle for an extended email dialog in which we discussed the tendency among some qualitative sport researchers to view ‘scientists’ as a homogeneous group. Ignoring the diversity among sport, exercise and health scientists, and overlooking the highly reflexive positions of some of these scholars and practitioners, works to reproduce barriers between positivist and interpretive or critical researchers, and limit the opportunities for fruitful transdisciplinary conversations about sport, exercise, education, health and moving bodies; Pringle is currently writing on this topic.

References


Evans, J. (forthcoming) *Ideational border crossings: if the intellectual relations don’t get you, then the social and political will*, *Discourse: Studies in the Cultural Politics of Education*.


