Minding the Body: An interdisciplinary theory of optimal posture for musicians

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Abstract
Posture influences music technique, and poor posture is associated with performance-related problems in musicians. Student musicians rely on music teachers, physiotherapists, and Alexander Technique teachers for advice about posture and performance-related problems. However, it is unknown whether these professional groups share a common understanding of optimal posture, or if posture management strategies align with performance goals. The aim of this study was to develop an interdisciplinary theory of posture to support musicians’ health and performance. This qualitative study used constructivist grounded theory as its methodological framework. Purposive sampling recruited four heads of university instrumental departments, three university physiotherapy lecturers and three heads of Alexander Technique teacher training schools to participate in semi-structured interviews. Interview transcripts were analyzed using grounded theory, and results were discussed applying the Theory of Planned Behaviour. The overarching theory of posture for musicians was Minding the Body, suggesting mind-body coordination. Subprocesses included rebalancing the self with the instrument and performance environment (Finding balance); minimizing effort (Maintaining ease); addressing adverse habits (Challenging habits); overcoming traditional perspectives to optimize performance (Expanding the framework), and addressing barriers to optimal posture (Barriers to change). This interdisciplinary theory presents posture as dynamic mind-body coordination to facilitate health and performance.

Keywords
health, interdisciplinary, musicians, playing-related problems, performance, posture

Posture affects musical tone, and is influential in the prevention and management of performance-related musculoskeletal problems (PRMP). However, there is no definition of optimal posture that encompasses the nuanced responsiveness sought by musicians and the biomechanical principles that concern health professionals. In this article we propose a
definition and functional theory of optimal posture developed from interviews with key informants from three professions usually consulted by musicians about posture: music education, physiotherapy, and Alexander Technique. Music educators provided additional insight into the experience of posture in music practice and performance from their own extensive performance histories. We present new theoretical categories, developed using constructivist grounded theory, which encapsulate perceived qualities and management strategies for optimal posture and provide a basis for a common language about posture between musicians and the disciplines working with them. The article was written from the perspective of the first author’s work teaching coordination for performance and health to professional and student performing artists.

Musicians consider posture as foundational to musical technique (Blanco-Piñeiro, 2013; Hopkins, 2011; Ruggieri & Katsnelson, 1996). Posture has been described as stillness, movement, and balance (Rosário, 2014), and the orientation of body components (Fortin, Feldman, Cheriet, & Labelle, 2011; Winter, 1995). Musicians and health professionals view posture as a factor contributing to the high prevalence of PRMP affecting musicians of all ages (Ackermann & Adams, 2004; Brandfonbrener, 2009; Brockman, Tubiana, & Chamagne, 1992; Lopez & Martinez, 2013; Ranelli, Straker, & Smith, 2008). Most research on posture has focused on biomechanics, with few studies investigating concerns of musicians, such as how posture affects movement quality and performance (Blanco-Piñeiro, 2013). Maintaining mobile limbs with stable, responsive body alignment, a balanced base of support to minimize stress and maximize efficiency, and being able to re-align after necessary postural deviations is considered desirable posture for musicians (Blanco-Piñeiro, Diaz-Pereira, & Martinez, 2015; Brockman et al., 1992). A theory that combines the multiple concepts of posture held by musicians and the health and education professionals who work with them may facilitate a unified approach to posture management and assist in reducing PRMP in musicians.

Posture in relation to PRMP is commonly discussed from a biomechanical perspective (Ackermann, 2010). The demands of instruments played in an elevated position, for example trumpet or trombone, and/or in an asymmetrical position such as a flute, violin, or bassoon, have been well documented (Heming, 2004; Nyman, Wiktorn, Mulder, & Johansson, 2007; Storm, 2006; Wahlstrom Edling & Fjellman-Wiklund, 2009). However, pianists and singers, who do not support an instrument and whose working positions are relatively symmetrical, are also vulnerable to performance-related problems (Bragge, Bialocerkowski, & McMeeken, 2006; Zaza, 1998). This suggests other factors such as muscle tension, balance, coordination, or stress may contribute to PRMP (Bragge, Bialocerkowski, & McMeeken, 2008; Davies & Mangion, 2002). Problems of posture extend beyond playing; postural stabilization system defects were found in 93% of 84 musicians attending a specialized clinic (Steinmetz, Seidel, & Muche, 2010), and over half of conservatoire music students showed postural faults when sitting and standing (Blanco-Piñeiro et al., 2015).

Musicians experience frustration in finding health care management relevant to their performance needs (Guptill, 2011; Rickert, Barrett, & Ackermann, 2014). Recovery from PRMP can be complicated by musicians receiving conflicting advice from the professionals trying to help them (Price & Watson, 2011). It is essential for musicians’ long-term health that the professionals working with them, including education and health professionals, have a shared understanding of posture. However, different disciplines, while ostensibly working toward a common goal, may in fact unknowingly be working at odds with one another (Denzin & Lincoln, 1995). Despite recognition of posture as influential in PRMP, there is no model of optimal posture for musicians that reconciles biomechanical and music performance concerns using the combined expertise of musicians and the professionals they consult for advice.
Therefore, the aim of this study was to answer the following questions:

1. How can optimal posture be defined for musicians?
2. What are perceived barriers to musicians using optimal posture?
3. What strategies can be used to teach and manage posture?

**Method**

**Research design**

Pragmatism provided the philosophical foundation for this study (Bacon, 2012; Peirce, 1905). Pragmatism acknowledges the contribution of all rational investigation, allowing adoption of a methodological approach that suits the research question (Bryman, 2012). It recognizes that phenomena exist outside the attitudes and ideas of any one person, but these phenomena are experienced and interpreted subjectively. It regards individual knowledge as fluid, finite, and subject to continuous change in response to new experiences. Attitudes and ideas are linked to how they affect practical experience (Bacon, 2012). Pragmatism insists researchers sustain doubt with respect to their beliefs, and provides a philosophical basis for questioning results as they arise, driving researchers back to the data to inform developing theory (Peirce, 1905). The theory arises from and feeds back into practical applications that the research is intended to enhance.

Qualitative research methods provide the means to systematically investigate the how and why questions that lie behind quantitative data (Liamputtong, 2013). The imperative for health professionals to understand the lived experience of musicians, the value of commonly understood language and goals, and the necessity of examining risk factors within the context from which they arise (Williams & Elliot, 2010) meant qualitative inquiry was the most appropriate vehicle for investigation of posture for musicians’ performance and health.

Rigor in qualitative research requires the role of researchers to be transparent as they interact with the enquiry through the lens of their own histories and perspectives, both informing and being informed by the process (Liamputtong, 2013). The question of optimal playing posture arose in the context of the first author’s work teaching coordination for health and performance to student and professional musicians.

Compatible with pragmatism and a qualitative research approach, grounded theory emphasizes attitudes and meaning developed through social interactions, allowing diverse data to be drawn together to capture “a broader social system of ideas” (Giacomini, 2010, p. 139) arising from and grounded in the data (Hesse-Biber & Leavy, 2011; Liamputtong, 2013). Grounded theory enabled us to view variations in participants’ views on posture and posture management strategies as expressions of different professional backgrounds rather than competing paradigms. The data-driven, iterative processes of grounded theory provided the means to incorporate these variations in professional approaches into an overall concept. Constructivist grounded theory also explicitly acknowledges the presence of the researcher’s knowledge and experience in interpretation and analysis of the data rather than as an objective or neutral observer (Charmaz, 2014). Therefore, this qualitative study used a research framework of constructivist grounded theory seated in pragmatism, to coalesce diverse approaches and create a common platform from which to build practical initiatives (Caronna, 2010; Charmaz, 2014; Collin, 2010).

Further perspective for interpreting the data was derived from the Theory of Planned Behaviour (Ajzen, 1991), which specifies four elements contributing to behavior change (Figure 1): **Attitude**
toward the behaviour (does a person consider it worthwhile); Subjective norm (perceived social pressure to pursue a new behaviour); Perceived behavioural control (perceived ease of accomplishing the change) and Intention (strength of the person’s intention to bring about change).

Participants

Purposive criterion sampling was used to recruit key informants in each of the three professional groups most often consulted by musicians about PRMP: music teachers, physiotherapists, and Alexander Technique teachers (Unpublished survey data, 2010). Four heads of university music departments (music educators), three physiotherapy lecturers and three heads of Alexander Technique teacher training courses consented to participate. As all music educators had been full-time performing musicians and continued to maintain an active performance schedule, they were able to speak with authority from the perspective of practicing musicians as well as educators. Participants were all teacher-practitioners, representing a cross-section of branches of knowledge from each of the three disciplines.

Data collection and management

The study data comprised audio recordings from in-depth semi-structured interviews (see Appendix). Participants were asked to define optimal posture as a general concept, and then optimal posture for musicians specifically, describe how they and others in their profession taught and managed posture, and identify barriers to musicians playing with optimal posture.

Data analysis

Complete transcripts of interviews were coded line-by-line using gerunds to capture processes in the data (Charmaz, 2014). Using constant comparative analysis to test codes and inform emergent categories, early codes were focused and developed to achieve theoretical saturation (Sbaraini, Carter, Evans, & Blinkhorn, 2011). Memos kept throughout the analytical process.
added perspective when distilling theoretical categories into the final theory that encompassed key concepts yielded by the data. A reflexive diary, cross-disciplinary consultation with other members of the research team and informal conversations with experienced musicians, physiotherapists, Alexander Technique teachers and other researchers provided triangulation throughout interpretation of the data.

**Results**

**Participants**

Male and female participants ranged in age from 30 to 64 years, with males and females providing comparable responses. Years of professional experience as a musician or practitioner ranged between 6 and 30 years. Eight of the 10 participants had more than 19 years of professional experience. Years spent training others for the profession ranged between 4 and 20 years.

Participants’ discussion of posture reflected their disciplinary frameworks. Music educators were clear about the quality of performance they were looking for and were creative in experimenting with strategies to achieve that quality. Alexander Technique teachers used defined principles to work with psychophysical coordination in service of the performance moment. Physiotherapists’ strategies were founded on a sophisticated understanding of body structure and mechanics. Posture management in physiotherapy was described as undergoing transition from predominantly mechanistic toward a more holistic functional approach.

**Posture definition**

Participants conveyed their understanding of posture using similar terms. All described posture as multidimensional: a cognitive, emotional, physical, situation-specific response. All defined optimal posture as efficient coordination that enabled the best performance with the least strain. Posture was regarded as idiosyncratic, reflecting the person’s history and physique, and influenced by injury and pathology. It was seen as a function of a person’s activity and intention in the moment.

> It’s very much based on ... the understanding of activity-dependent neuroplasticity ... whereby whatever activity the nervous system is experiencing, will ... define ... how someone moves or how their posture presents ... activity-dependent neuroplasticity also refers to cognition and emotion. (Physiotherapy lecturer A, lines 77–80, 94–95)

Optimal posture for musicians was seen as engaging the whole person, not just the body part interfacing with the instrument. Dynamism, balance, fluidity, openness, effortlessness, comfort, groundedness, and allowing an even, uninterrupted flow of breath were all conditions that participants associated with optimal posture. Music educators regarded optimal posture as fundamental to producing good musical tone, and associated effortless, open coordination with beautiful sound. Conversely, they associated interruptions in smooth coordination with disruptions in musical flow.

> When it’s not happening like that the tone becomes squashed, ... it doesn’t ring; ... the tone becomes ... very flat, in colour. (Music educator A, lines 186–189)

Participants acknowledged structure and function varied between individuals, but deemed it possible for everyone to function optimally within their circumstances. Posture described as
non-optimal was for any part of the body to be over-contracted, collapsed, cramped, squeezed or uncomfortable.

If people aren’t in what you’d call good posture then we tend to get ... the neck being contracted ... pulling the head back or poking the head forward ... the shoulder girdle ... lifted up, rounded forward or pulled back ... the torso ... collapsed forward or over extended and gripping through the legs ... (Alexander teacher trainer A, lines 56–60)

... the body ... doesn’t look comfortable; doesn’t look relaxed and doesn’t look smooth, doesn’t look natural. (Music educator B, lines 64–65)

All participants rejected the idea of posture as position, either stating they neither used nor taught this concept because of its static connotations, or bypassing it to talk about movement and behavior instead. Participants familiar with the plumb line idea of posture, where an imaginary line is dropped from the ear through the shoulder, the hip, the knee and anterior to the ankle joint, suggested that its value lay in providing a reference point to show the wide variations of normal rather than as a gauge for perfect posture. Biomechanical factors were considered, including the length of lever arms, angles and planes of movement, and physical loading on joints and soft tissue. However, describing posture only in positional terms was regarded as failing to convey its biopsychosocial character and the complexity of moment-to-moment responses required during activity.

**Minding the Body**

The physical, psychological, intentional, and contextual elements comprising optimal posture sparked the overarching theory developed in this study: *Minding the Body*. This title describes the interdependence of body and mind, and suggests taking care of the body for improved performance and health.

*Minding the Body* theory development was contingent upon subprocesses that emerged from the data, including continually rebalancing the body with the instrument and with the intense demands of performance (*Finding balance*); minimizing effort when playing (*Maintaining ease*); the difficulty of addressing entrenched habits that interfere with optimal posture (*Challenging habits*); the imperative to look beyond purely mechanistic factors and embrace unfamiliar methods to bring about open, dynamic poise (*Expanding the framework*), and identifying and addressing barriers to playing with optimal posture (*Barriers to change*) (see Figure 2). The qualities participants associated with optimal posture are shown in Table 1. Table 2 details strategies participants used to teach and retrain posture. Table 3 outlines the subprocess *Barriers to change* and potential strategies to overcome these barriers.

**Finding balance**

*Finding balance* (see Table 1) refers to moment-to-moment rebalancing between the musician, the instrument, the shifting demands of the music and the performance environment. Several participants considered dynamic, expansive organization of the torso and freedom in the legs was necessary for proper support of the arms and the instrument and optimal availability of the breathing mechanism. Being able to return to neutral after bouts of necessary distortion was also seen as part of finding balance. Musical expressiveness was regarded as a function of continuous physical and emotional rebalancing internally as well as in relation to the instrument and the environment externally.
Clarifying mental intention to match the immediate requirements of performance was another aspect of *Finding balance*. Intention was seen to mobilize the brain with the direction needed to organize the person into activity, with an unconsciously divided intention disrupting optimal coordination. Divided intention meant musicians unwittingly generated effort that did not contribute to the desired outcome, for example unconsciously organizing their coordination around their visual focus on the printed music like an actor script reading, or being caught between the desire to perform and anxiety about performing.
Psychology of Music

What’s important ... is that they know what it is they need to do, in order to achieve what they want ... You’re ... asking for a cognitive clarity about what is required for what they’re doing and what is not required, and ... the result is, that the activity itself functions more optimally ... My first question is: do you really want to do this right now? “No, I don’t.” Why are you here? “Because I want to do it.” ... you’re telling two things to your system at the moment and it won’t work ... either get clear that you want to do it or you get clear that you don’t. (Alexander teacher trainer B, lines 45–47, 88–91, 166–170)

One participant associated overall balance with more technical facility, comfort, and confidence. He described dynamic balance as being able to balance the weight of the bow arm against a sense of support to elicit an effortless but lively “sprung” quality in the arm that can prevent such disconcerting difficulties as bow shakes, where the bow shakes uncontrollably during performance.

If you’re physically uncomfortable and you have the pressure of performing, this is where it becomes really hard ... Bow shakes often come from not knowing how to actually find weight ... they’ve muscled the sound, so they haven’t found it from a natural weight ... And it has a huge impact on people’s confidence. (Music educator C, lines 234–245, 254)

**Table 2.** Minding the Body: Subprocesses Challenging habits and Expanding the framework.

<table>
<thead>
<tr>
<th>Sub-process</th>
<th>Suggested strategies</th>
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<tbody>
<tr>
<td>Challenging habits</td>
<td>Engage awareness from the first lesson using: sensory feedback (kinaesthetic, visual, auditory) peer feedback in group classes perceived exertion scale imagery focused listening guided movement to assist re-patterning recognition of interferences to ease Retrain movement by: working with and without the instrument being diligent about ease providing alternative strategies for coordination establishing clear intent for quality teaching the directions musicians need to move in attending to the central coordination of head, neck, and back teaching correct body mapping providing strategies the musician is responsible for, contributes to, and can work with independently facilitating adequate stamina, strength, mobility, and stability</td>
</tr>
<tr>
<td>Expanding the framework</td>
<td>Embrace new concepts of posture by: accessing expertise beyond your own considering cognitive, emotional, contextual, and physical factors (biopsychosocial approach) knowing the demands of the activity including all elements of the task in progress facilitating setups that enable the activity to happen in the desired manner aiming for dynamic expansion of the whole body attending to damaged and vulnerable anatomical structures and emotional constructs facilitating normal movement as an aid to recovery adjusting management in line with evidence screening for early correction</td>
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</tbody>
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Maintaining ease

Maintaining ease was considered essential to movement and balance and was associated with performance quality and health. Maintaining ease was seen to enhance intonation (pitch accuracy), skilful handling of the instrument, and the ability to listen, giving the musician more access to musicality (Table 1).

There’s too much tension in just the grabbing of the bow, when in fact you should hold it like a baby bird ... If that’s tense ... the brain ... can’t really adjust, but when it’s soft, you just play much, much more in tune. (Music educator C, lines 58–59, 182–184)

Can you get the violin in a position where you can still be functional, without overactivity ... can you actually relax that muscle without interrupting the function that you need to perform? (Physiotherapy lecturer B, lines 235–239)

Acquisition of excessive tension was thought to begin from first contact with the instrument. Participants described young students’ common expectation that handling or playing an instrument is hard work, so that they automatically approach it with excessive effort. After that, technique is potentially built around an unconscious tension pattern that restricts playing and becomes increasingly difficult to change.

It was acknowledged that many excellent musicians play with very tense technique. Even so, excessive tension or strain was considered to be risky for playing health and longevity. Learning to build ease into playing was seen to reduce unconsciously acquired effort, increasing the

Table 3. Barriers to musicians playing with optimal posture and proposed strategies.

<table>
<thead>
<tr>
<th>Barriers to change</th>
<th>Suggested strategies</th>
</tr>
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<tbody>
<tr>
<td>Insufficient understanding of:</td>
<td>• Aim for dynamic, efficient psychophysical coordination for peak performance</td>
</tr>
<tr>
<td>how the body works during music making</td>
<td>• Collaborate, educate, and refer between disciplines</td>
</tr>
<tr>
<td>what is happening in the nervous system</td>
<td>• Communicate information experientially as well as intellectually</td>
</tr>
<tr>
<td>how to go about creating desired conditions</td>
<td>• Provide an experience of the relationship between intent and action in organizing</td>
</tr>
<tr>
<td>how to prevent and manage problems</td>
<td>coordination</td>
</tr>
<tr>
<td>Lack of awareness</td>
<td>• Alter management in line with emerging research</td>
</tr>
<tr>
<td>Resistance of habits to change</td>
<td>• See strategies for Challenging habits in Table 2</td>
</tr>
<tr>
<td>Unquestioning adherence to music teaching or practice traditions</td>
<td>• See strategies for Challenging habits in Table 2</td>
</tr>
<tr>
<td>Focusing on outcomes to the exclusion of process</td>
<td>• Be meticulous in applying effortless coordination as central to learning and</td>
</tr>
<tr>
<td>Insufficient time to attend to details of coordination in teaching and treatment</td>
<td>performance</td>
</tr>
<tr>
<td>environments</td>
<td>• Act on the premise that taking the time to insist on correct process hastens</td>
</tr>
<tr>
<td></td>
<td>learning, reduces probability of injury, and enhances music technique</td>
</tr>
<tr>
<td></td>
<td>• Promote self-efficacy by providing students with accessible strategies to put into</td>
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<tr>
<td></td>
<td>practice outside lesson time</td>
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<tr>
<td></td>
<td>• Maintain an attitude of critical evaluation</td>
</tr>
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<td></td>
<td>• Be willing to adopt change if it achieves a better result or prevents problems</td>
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<tr>
<td></td>
<td>• Be open to alternative methods</td>
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<tr>
<td></td>
<td>• Be meticulous in applying effortless coordination as central to learning and</td>
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<td>practice outside lesson time</td>
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</table>
potential for movement and decreasing the strain that appears to be a common precursor to injury. Participants associated effortless coordination with fewer injuries.

**Challenging habits**

Most participants referred to the challenge of changing long-standing habits. Music educators expressed frustration at students’ frequent inability to absorb and act on instructions about body use. Two participants noted some students struggled to see what was wrong even with visual video feedback, while another observed telling students what to do had no effect. The failure to change unfavorable habits in response to instruction was attributed to laziness, limited intellectual capacity, lack of motivation to change, or lack of kinesthetic awareness. Several participants suggested that musicians often do not possess a mechanism to identify what is amiss or to bring about the needed change.

> I say … go and have a look in the mirror … and then they can kind of half change it … they don’t have a mechanism for slowing something down, and analysing what actually moves … (Music educator D, lines 175–180)

Strategies suggested by participants to challenge adverse patterns centered on engaging awareness and retraining movement (Table 2). Activities away from the instrument included singing, mental practice, buzzing into the mouthpiece, sidestepping any anticipation of effort by distracting children with chit-chat until the instrument was placed effortlessly ready to play, or running a hand back and forth along a broomstick to get a natural order for movement in the left arm for playing strings. Accurate body mapping was sometimes used to correct movement organized around a distorted perception of how or where it should occur.

Several participants taught students to deliberately choose against pursuing a counterproductive habitual pathway and to replace the habit with a clear intention to organize coordination for the activity. Making this choice could initially be experienced as wrong or awkward, as longstanding habits can feel right and comfortable even if they are detrimental. Participants who used this approach termed the feeling of rightness of the familiar pattern whether damaging or not, attracting the tendency to favor it over a new unfamiliar one, faulty sensory perception.

> You’ve got these two choices … one of them will be habitual and kinesthetically demanding in as much as it’s going to be saying … “this is the way we do it.” The other will have a richness of sensory experience which is novel and new, but will also have a voice saying: this can’t be right, this can’t be right … (Alexander teacher trainer B, lines 392–397)

Several participants observed that in trying to improve playing, music students often spent many hours practicing without achieving the desired outcome. The point was made that trying to modify an activity on the basis of faulty sensorimotor organization could frustrate progress unless the underlying problem was addressed. Returning to a clear intent for optimal coordination to achieve the desired outcome beginning with the central coordination of the head, neck, and back was suggested as a counterstrategy.

**Expanding the framework**

*Expanding the framework* suggests movement toward the open, responsive condition that participants described as optimal posture. It also suggests being receptive to new ways of thinking, embracing unfamiliar approaches to teaching and management that may initially be uncomfortable to
consider (See Table 2). Conventional approaches to education and health were perceived as dualist, whereas according to participants, posture management should focus on function as a whole. Watching musicians play, assessing them with the instrument, and understanding what they are aiming to achieve was regarded as essential to providing appropriate advice.

One participant observed the practice of keeping vulnerable tissues static to protect and support them was being replaced by encouraging normal movement to aid recovery, and addressing the vulnerable person rather than focusing solely on vulnerable tissue. Making these adjustments to treatment paradigms in response to emerging evidence was seen as responsible practice.

The micro view I don’t think is necessarily the best way to go ... it’s certainly helpful if you can find something and resolve that, but if you’re not taking a macro view at the same time, then you know it can be limiting. (Physiotherapy lecturer A, lines 337–340)

Not every teacher ... looks at people at the instrument, but I certainly would do that, from the very first lesson because I’m wanting to get a sort of overall picture, not just of their movement ... but ... how they respond to organising themselves around the instrument ... we really have to re-educate the whole. (Alexander teacher trainer A, lines 201–205, 242)

Participants familiar with music culture spoke of a resolute adherence to teaching traditions on the part of music teachers, where teachers do not question physically inefficient or potentially harmful aspects of the tradition, and suggestions involving changes in technique are often met with resistance. There was speculation music teachers might be inspired to espouse more mechanically efficient playing methods if they had more knowledge of body mechanics and an accurate understanding of what was required to produce sound. One participant suggested the decision to use any strategy should be based on whether or not it improved harmonious function.

Use affects function ... if the change that you have suggested results in increased functionality of the activity then you know you’re on the right track. (Alexander teacher trainer B, lines 323–326)

**Barriers to change**

*Barriers to change* (Table 3) included music teachers’ reluctance to modify traditional teaching practices, and limitations on the part of support professionals in understanding the mechanisms required to play and the processes that deliver optimal performance.

Participants believed that many health practitioners dealing with musicians lacked sufficient knowledge about the demands of playing and performance to be able to target problems effectively, and musicians lacked knowledge about the mechanisms that foster both optimal performance and health. For several participants, experience and emerging research had modified previous positional approaches to posture management to the student or patient’s functional goals becoming the focus of intervention. The value of collaborating with professionals from other disciplines to expand the knowledge base was highlighted.

You teach me about what you’re looking at and I’ll teach you [what I’m looking at] ... let’s see if we can come up with a final product that we both understand. But you’ve got to understand the demands. (Physiotherapy lecturer C, lines 233–238)

The inordinate amount of remedial work musicians needed on entering university was deemed due to elementary music teachers’ preoccupation with outcomes; their concentration on students doing enough practice to prepare for an exam or concert, and not necessarily
attending to the mental and physical processes that lead to optimal performance. The widely taught Australian program of prescribed technical work and repertoire increasing in complexity as the grades advance but with no suggestion as to how that should be done was seen as reinforcing outcome-oriented focus at the expense of playing quality. Consequences of outcome- as opposed to process-oriented learning from the earliest stages of music tuition included students being unable to develop beyond a certain point of playing, dropping out due to injury, or entering tertiary music study needing extensive remediation of playing technique. Perceived time constraints in educational and treatment settings limited the extent to which the complexities of playing coordination could be addressed, and participants advocated that musicians be routinely screened to address playing problems as early as possible.

Early on, remedial work is easy. Towards the end it gets increasingly hard and I think of so many people, that I’ve known built up ... on shaky foundations ... they do something, and then they collapse. (Music educator D, lines 357–360)

A further barrier to change was seen as musicians becoming engaged in posture or any other aspect of technique in a way that separated it from music making, and losing sight of performance as the goal of coordination.

What I’m really listening for ... is the musical opinion or the expressive intention ... And then ... what are the little barriers and obstacles that are preventing your opinion coming across. (Music educator B, lines 253–256)

their ultimate intention is to communicate with their audience ... everything that they’re analysing or doing is in service of that intention ... (Alexander teacher trainer B, lines 602–603)

Discussion

This interdisciplinary theory of optimal posture for musicians draws together concepts and strategies from key informants for teaching and managing musicians’ posture, and discusses barriers to optimal posture when playing or singing. Posture defined as a dynamic expression of biopsychosocial factors specific to time, place, person and context, supersedes the conventional biomechanical model of posture. Participants concurred that optimal posture for musicians should allow the best performance with the greatest efficiency, with function as the focus. This holistic approach to posture, with posture management involving individual assessment of the musician while singing or playing as well as away from the instrument, is consistent with developments in health research (Brandonbrener, 2010; Butler & Moseley, 2013a; Dommerholt, 2010; Lederman, 2010; Lopez & Martinez, 2013).

Unquestioning adherence to teaching traditions in music mirrors the lag in adoption of biopsychosocial practices in health care, exemplified by the persistence of the biomechanical approach to posture. Musicians experience frustration and confusion on encountering practitioners who do not understand performance, who do not work as a team and who may offer conflicting advice (Norton, Ginsborg, Greasley, & McEwan, 2015; Price & Watson, 2011; Rickert et al., 2014). Moving beyond disciplinary knowledge, tolerating the discomfort of alternative areas of expertise, recognizing strengths and limitations in each profession, and referring appropriately to draw on other competencies—Expanding the framework—has the potential to provide the best range of resources to benefit musicians (Clark, Williamon, & Redding, 2013; Hall, 2005).
Musicians’ primary focus is on performance quality. They may place little or no weight on issues such as health that concern other practitioners, unless pain or other symptoms actually interfere with playing. In this study, participants’ knowledge and strategies reflected the emphases inherent in their professional backgrounds. Music educators strived to bring about in their students artistic and skilful execution of musical ideas in communication with an audience (Williamon, 2004). Alexander teacher trainers’ strategies reflected the development of the Alexander Technique as a psychophysical approach to the demands and challenges of performance (Alexander, 1943; Tinbergen, 1974). Physiotherapists’ posture management was in transition from focusing predominantly on body structure and biomechanics to contextualizing posture as function for work or leisure, and, through contemporary pain research, recognizing the indivisibility of the mind and body (Butler & Moseley, 2013b). The implication for these diverse approaches is that each professional perspective has something to offer musicians’ posture management. The potential for conflicting advice offered to musicians by professionals from different disciplines (Denzin & Lincoln, 1995; Price & Watson, 2011) could be circumvented by establishing a unified goal that matches the meaning musicians place on their activity. The model of optimal posture presented in this study suggests keeping clear a central goal of dynamic, balanced, effortless, efficient coordination for optimal performance.

Participants’ discussion of posture revealed overt and covert attitudes that have led to difficulties in addressing posture. These attitudes include restrictive teaching and management practices in music and health, the erroneous assumption that knowledge necessarily leads to behavior change (Ajzen, Joyce, Sheikh, & Gilbert Cote, 2011), inadequate understanding of the nature of habit, and not knowing or not caring about the psychophysical mechanisms governing optimal coordination. Commonly held beliefs such as “no pain, no gain” and that increased practice hours directly correspond to improved playing have been debunked by research (Williamon, 2004), but counterproductive attitudes in the learning and performance environments persist. The intense competition to enter music schools increases the pressure to conform to the attitudes that shape those environments.

The theory of posture arising from this study suggests posture can be framed as a behavioral response with biomechanical outcomes. Behavior occurs in a given situation in the context of a person’s history and the surrounding culture (Michie, van Stralen, & West, 2011). Posture management without regard to these factors is likely to address symptoms rather than causes. The established convention of addressing posture as purely biomechanical may explain why musicians’ posture has continued to be such a problem.

Many health recommendations rely on an implicit assumption that disseminating information is sufficient to change behavior and improve health outcomes when this is not the case (Ajzen et al., 2011). The Theory of Planned Behaviour postulates beliefs rather than knowledge predict behavior, accuracy of information is irrelevant to the prediction of behavior, and knowledge only changes behavior if it alters one or more of the factors that inform intention (Ajzen et al., 2011). Instead of introducing more knowledge, the pathway to behavior change calls for identifying what existing knowledge governs beliefs around the outcome of interest and presenting information that challenges beliefs detrimental to the desired outcome, reinforces beliefs congruent with the outcome, or creates new constructive beliefs that strengthen that outcome.

The subprocesses comprising our proposed theory of optimal posture parallel the Theory of Planned Behaviour (Ajzen, 1991). Maintaining ease and Finding balance potentially impact perceived behavioral control; Barriers to change and Challenging habits impact subjective norm, and Expanding the framework corresponds to all three elements affecting intention (Figure 1).
Working with posture as behavior while addressing deeper cultural and policy issues (Atkins, 2013; Michie et al., 2011) could shift posture management toward better outcomes for performance and health.

Challenging habits, particularly if they have been reinforced over time, is a significant barrier to optimal posture. The failure of students to respond to instruction and students’ poor awareness of postural faults demand strategies that provide musicians with new sensorimotor and cognitive points of reference. The inhibition or choice against responding habitually to a stimulus described in this study suggests a process to supplant habit with conscious intention, and proposes conscious direction in place of feeling right as a means to access optimal coordination (Alexander, 1943; Madden 2014). Feeling wrong is an unreliable arbiter of whether a proposed change is constructive, as new approaches tend to be judged on pre-existing behavior and beliefs and can feel wrong at first just because they are unfamiliar. These principles of inhibition and direction exercised in the presence of faulty sensory appreciation parallel the Theory of Planned Behaviour’s perceived behavioral control, intention, and subjective norm respectively. Taking time to intercept habit using this process, though time-consuming initially, can speed up learning and improve playing quality while preserving health in musicians (De Alcantara, 1997; Kleinman & Buckoke, 2013). Performance outcomes and wellbeing could be used to judge the value of new approaches to playing.

The strengths of this study were the application of a theory of behavior to increase its practical relevance; the researchers had training across the disciplines represented, and triangulation of data occurred through ongoing discussion. Rigor was provided by constant comparative analysis and by keeping a reflexive diary. Although participants represented a small sample of the music and health community, their key informant status, and the congruence of the data with clinical observation and the broader experience of musicians and the practitioners who work with them support the relevance of this study’s conclusions. The majority of participants taught in the tertiary environment, which raises the question of whether the proposed theory would be relevant to other age groups of musicians. However, as all participants had also practiced and taught in the wider public arena a broader outlook informed their discussion. A weakness of the study was that professional disciplines expert in music and posture not included in this study may have contributed further perspectives to the discussion.

Conclusions

An interdisciplinary theory of optimal posture for musicians was developed using constructivist grounded theory, and comprises a definition, teaching and management strategies and suggestions to address barriers to optimal posture. The inclusion of cognitive, emotional, contextual, and physical factors reflects current understanding of health and function as a biopsychosocial phenomenon.

All participants defined optimal posture as efficient coordination enabling the best possible performance with the greatest efficiency. *Minding the Body* as the overarching theoretical process of optimal posture indicates the inseparable nature of the mind and body, as well as the importance of taking care of the body. *Minding the Body* comprises five interrelated subprocesses: *Maintaining ease*, suggesting effortlessness and biomechanical efficiency; *Finding balance*, describing the continual rebalancing that occurs between the musician, the music, the instrument, and the playing environment; *Challenging habits*, referring to the challenge of entrenched
habits and the strategies used to overcome them; Expanding the framework, expressing the physical expansiveness associated with effortlessly balanced coordination and the mental openness needed to constantly develop one’s own playing; Barriers to change, describing impediments to musicians playing with optimal posture and suggesting that overcoming these provides a way forward.

Functional approaches relevant and directly applicable to performance, and incorporating principles of behavior change are required to manage posture in musicians. Management should include strategies to address habit, conscious and unconscious intention, and musicians’ beliefs about the effort required to play or sing.

Potential conflicts between professional perspectives on optimal posture for musicians should be averted by respectful interdisciplinary collaboration characterized by openness to unfamiliar paradigms, setting aside traditional professional hierarchies to place music and musicians’ expertise at the center. Teachers and practitioners working with musicians should serve a common goal of dynamic, balanced, effortless, efficient coordination for optimal performance.

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References


Appendix

Interview schedule

1. How would you define “optimal posture?”
2. What would you consider to be optimal posture for a musician and why?
3. How do you teach posture to your students?
4. What strategies do you use to address postural problems in your students?
5. Do you think these strategies are generally used by others in your field? If not, what strategies do you think other teachers/practitioners in your field generally use?
6. What do you see as the main barriers to musicians understanding and exercising optimal posture while they are playing?
7. Do you have any further comments on the subject of posture in musicians?