

# Neurobiology of Selfcare

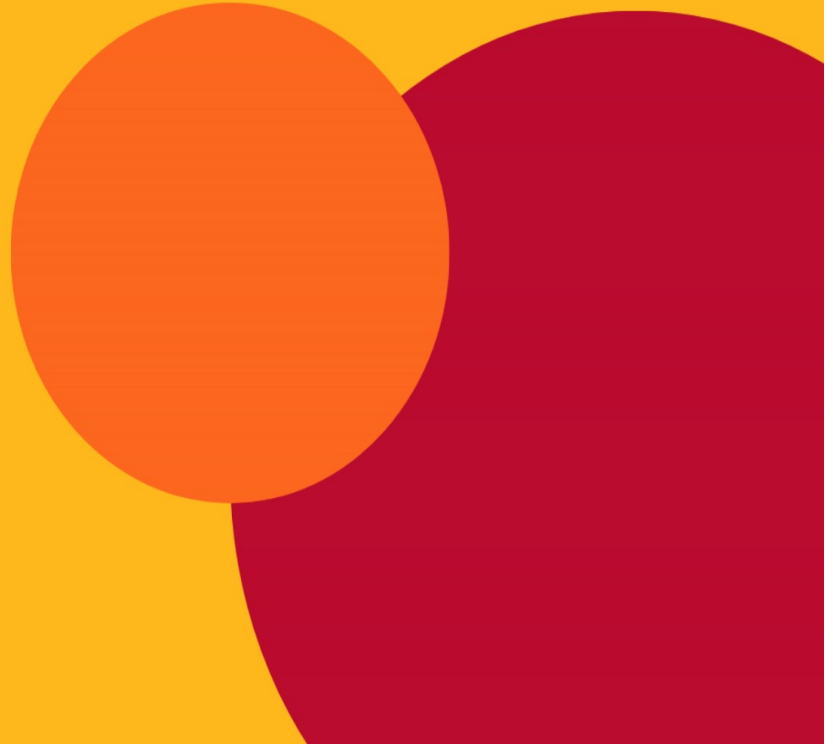
Activities and readings

Monday 5 December 2022





Australian  
Childhood  
Foundation



## PROFESSIONAL QUALITY OF LIFE SCALE (PROQOL)

### COMPASSION SATISFACTION AND COMPASSION FATIGUE (PROQOL) VERSION 5 (2009)

When you [help] people you have direct contact with their lives. As you may have found, your compassion for those you [help] can affect you in positive and negative ways. Below are some questions about your experiences, both positive and negative, as a [helper]. Consider each of the following questions about you and your current work situation. Select the number that honestly reflects how frequently you experienced these things in the last 30 days.

**1=Never**

**2=Rarely**

**3=Sometimes**

**4=Often**

**5=Very Often**

- \_\_\_\_\_ 1. I am happy.
- \_\_\_\_\_ 2. I am preoccupied with more than one person I [help].
- \_\_\_\_\_ 3. I get satisfaction from being able to [help] people.
- \_\_\_\_\_ 4. I feel connected to others.
- \_\_\_\_\_ 5. I jump or am startled by unexpected sounds.
- \_\_\_\_\_ 6. I feel invigorated after working with those I [help].
- \_\_\_\_\_ 7. I find it difficult to separate my personal life from my life as a [helper].
- \_\_\_\_\_ 8. I am not as productive at work because I am losing sleep over traumatic experiences of a person I [help].
- \_\_\_\_\_ 9. I think that I might have been affected by the traumatic stress of those I [help].
- \_\_\_\_\_ 10. I feel trapped by my job as a [helper].
- \_\_\_\_\_ 11. Because of my [helping], I have felt "on edge" about various things.
- \_\_\_\_\_ 12. I like my work as a [helper].
- \_\_\_\_\_ 13. I feel depressed because of the traumatic experiences of the people I [help].
- \_\_\_\_\_ 14. I feel as though I am experiencing the trauma of someone I have [helped].
- \_\_\_\_\_ 15. I have beliefs that sustain me.
- \_\_\_\_\_ 16. I am pleased with how I am able to keep up with [helping] techniques and protocols.
- \_\_\_\_\_ 17. I am the person I always wanted to be.
- \_\_\_\_\_ 18. My work makes me feel satisfied.
- \_\_\_\_\_ 19. I feel worn out because of my work as a [helper].
- \_\_\_\_\_ 20. I have happy thoughts and feelings about those I [help] and how I could help them.
- \_\_\_\_\_ 21. I feel overwhelmed because my case [work] load seems endless.
- \_\_\_\_\_ 22. I believe I can make a difference through my work.
- \_\_\_\_\_ 23. I avoid certain activities or situations because they remind me of frightening experiences of the people I [help].
- \_\_\_\_\_ 24. I am proud of what I can do to [help].
- \_\_\_\_\_ 25. As a result of my [helping], I have intrusive, frightening thoughts.
- \_\_\_\_\_ 26. I feel "bogged down" by the system.
- \_\_\_\_\_ 27. I have thoughts that I am a "success" as a [helper].
- \_\_\_\_\_ 28. I can't recall important parts of my work with trauma victims.
- \_\_\_\_\_ 29. I am a very caring person.
- \_\_\_\_\_ 30. I am happy that I chose to do this work.

## YOUR SCORES ON THE PROQOL: PROFESSIONAL QUALITY OF LIFE SCREENING

Based on your responses, place your personal scores below. If you have any concerns, you should discuss them with a physical or mental health care professional.

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### Compassion Satisfaction \_\_\_\_\_

Compassion satisfaction is about the pleasure you derive from being able to do your work well. For example, you may feel like it is a pleasure to help others through your work. You may feel positively about your colleagues or your ability to contribute to the work setting or even the greater good of society. Higher scores on this scale represent a greater satisfaction related to your ability to be an effective caregiver in your job.

The average score is 50 (SD 10; alpha scale reliability .88). About 25% of people score higher than 57 and about 25% of people score below 43. If you are in the higher range, you probably derive a good deal of professional satisfaction from your position. If your scores are below 40, you may either find problems with your job, or there may be some other reason—for example, you might derive your satisfaction from activities other than your job.

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### Burnout \_\_\_\_\_

Most people have an intuitive idea of what burnout is. From the research perspective, burnout is one of the elements of Compassion Fatigue (CF). It is associated with feelings of hopelessness and difficulties in dealing with work or in doing your job effectively. These negative feelings usually have a gradual onset. They can reflect the feeling that your efforts make no difference, or they can be associated with a very high workload or a non-supportive work environment. Higher scores on this scale mean that you are at higher risk for burnout.

The average score on the burnout scale is 50 (SD 10; alpha scale reliability .75). About 25% of people score above 57 and about 25% of people score below 43. If your score is below 43, this probably reflects positive feelings about your ability to be effective in your work. If you score above 57 you may wish to think about what at work makes you feel like you are not effective in your position. Your score may reflect your mood; perhaps you were having a “bad day” or are in need of some time off. If the high score persists or if it is reflective of other worries, it may be a cause for concern.

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### Secondary Traumatic Stress \_\_\_\_\_

The second component of Compassion Fatigue (CF) is secondary traumatic stress (STS). It is about your work related, secondary exposure to extremely or traumatically stressful events. Developing problems due to exposure to other's trauma is somewhat rare but does happen to many people who care for those who have experienced extremely or traumatically stressful events. For example, you may repeatedly hear stories about the traumatic things that happen to other people, commonly called Vicarious Traumatization. If your work puts you directly in the path of danger, for example, field work in a war or area of civil violence, this is not secondary exposure; your exposure is primary. However, if you are exposed to others' traumatic events as a result of your work, for example, as a therapist or an emergency worker, this is secondary exposure. The symptoms of STS are usually rapid in onset and associated with a particular event. They may include being afraid, having difficulty sleeping, having images of the upsetting event pop into your mind, or avoiding things that remind you of the event.

The average score on this scale is 50 (SD 10; alpha scale reliability .81). About 25% of people score below 43 and about 25% of people score above 57. If your score is above 57, you may want to take some time to think about what at work may be frightening to you or if there is some other reason for the elevated score. While higher scores do not mean that you do have a problem, they are an indication that you may want to examine how you feel about your work and your work environment. You may wish to discuss this with your supervisor, a colleague, or a health care professional.

## WHAT IS MY SCORE AND WHAT DOES IT MEAN?

In this section, you will score your test so you understand the interpretation for you. To find your score on **each section**, total the questions listed on the left and then find your score in the table on the right of the section.

### Compassion Satisfaction Scale

Copy your rating on each of these questions on to this table and add them up. When you have added them up you can find your score on the table to the right.

3. \_\_\_\_\_  
 6. \_\_\_\_\_  
 12. \_\_\_\_\_  
 16. \_\_\_\_\_  
 18. \_\_\_\_\_  
 20. \_\_\_\_\_  
 22. \_\_\_\_\_  
 24. \_\_\_\_\_  
 27. \_\_\_\_\_  
 30. \_\_\_\_\_

**Total:** \_\_\_\_\_

The sum of my Compassion Satisfaction questions is	So My Score Equals	And my Compassion Satisfaction level is
22 or less	43 or less	Low
Between 23 and 41	Around 50	Average
42 or more	57 or more	High

### Burnout Scale

On the burnout scale you will need to take an extra step. Starred items are "reverse scored." If you scored the item 1, write a 5 beside it. The reason we ask you to reverse the scores is because scientifically the measure works better when these questions are asked in a positive way though they can tell us more about their negative form. For example, question 1. "I am happy" tells us more about

- \*1. \_\_\_\_\_ = \_\_\_\_\_  
 \*4. \_\_\_\_\_ = \_\_\_\_\_  
 8. \_\_\_\_\_  
 10. \_\_\_\_\_  
 \*15. \_\_\_\_\_ = \_\_\_\_\_  
 \*17. \_\_\_\_\_ = \_\_\_\_\_  
 19. \_\_\_\_\_  
 21. \_\_\_\_\_  
 26. \_\_\_\_\_  
 \*29. \_\_\_\_\_ = \_\_\_\_\_

**Total:** \_\_\_\_\_

The sum of my Burnout Questions is	So my score equals	And my Burnout level is
22 or less	43 or less	Low
Between 23 and 41	Around 50	Average
42 or more	57 or more	High

You Wrote	Change to	
	5	the effects of helping when you are <i>not</i> happy so you reverse the score
2	4	
3	3	
4	2	
5	1	

### Secondary Traumatic Stress Scale

Just like you did on Compassion Satisfaction, copy your rating on each of these questions on to this table and add them up. When you have added them up you can find your score on the table to the right.

2. \_\_\_\_\_  
 5. \_\_\_\_\_  
 7. \_\_\_\_\_  
 9. \_\_\_\_\_  
 11. \_\_\_\_\_  
 13. \_\_\_\_\_  
 14. \_\_\_\_\_  
 23. \_\_\_\_\_  
 25. \_\_\_\_\_  
 28. \_\_\_\_\_

**Total:** \_\_\_\_\_

The sum of my Secondary Trauma questions is	So My Score Equals	And my Secondary Traumatic Stress level is
22 or less	43 or less	Low
Between 23 and 41	Around 50	Average
42 or more	57 or more	High

## Reflect



### Activity

## The Impacts of my Work: Thinking about my job

Take a moment to think about how your work is impacting you.

1. On a scale from 1-5, how happy am I getting up in the morning and thinking about work?

1 2 3 4 5

Very hard to motivate myself to get to work.

Very happy getting up in the morning looking forward to work.

2. On a scale from 1-5, how challenged do you feel at work?

1 2 3 4 5

My work feels monotonous and too predictable.

My work offers me new and interesting challenges.

3. On a scale from 1-5, how do you feel about your supervision?

1 2 3 4 5

What Supervision?

My Supervision is helpful and motivates me to keep going

4. On a scale from 1-5, how do I balance personal and work life?

1 2 3 4 5

What personal life?

I manage the balance between work and personal life well.

5. On a scale from 1-5, how well does my belief about self-care match my practice?

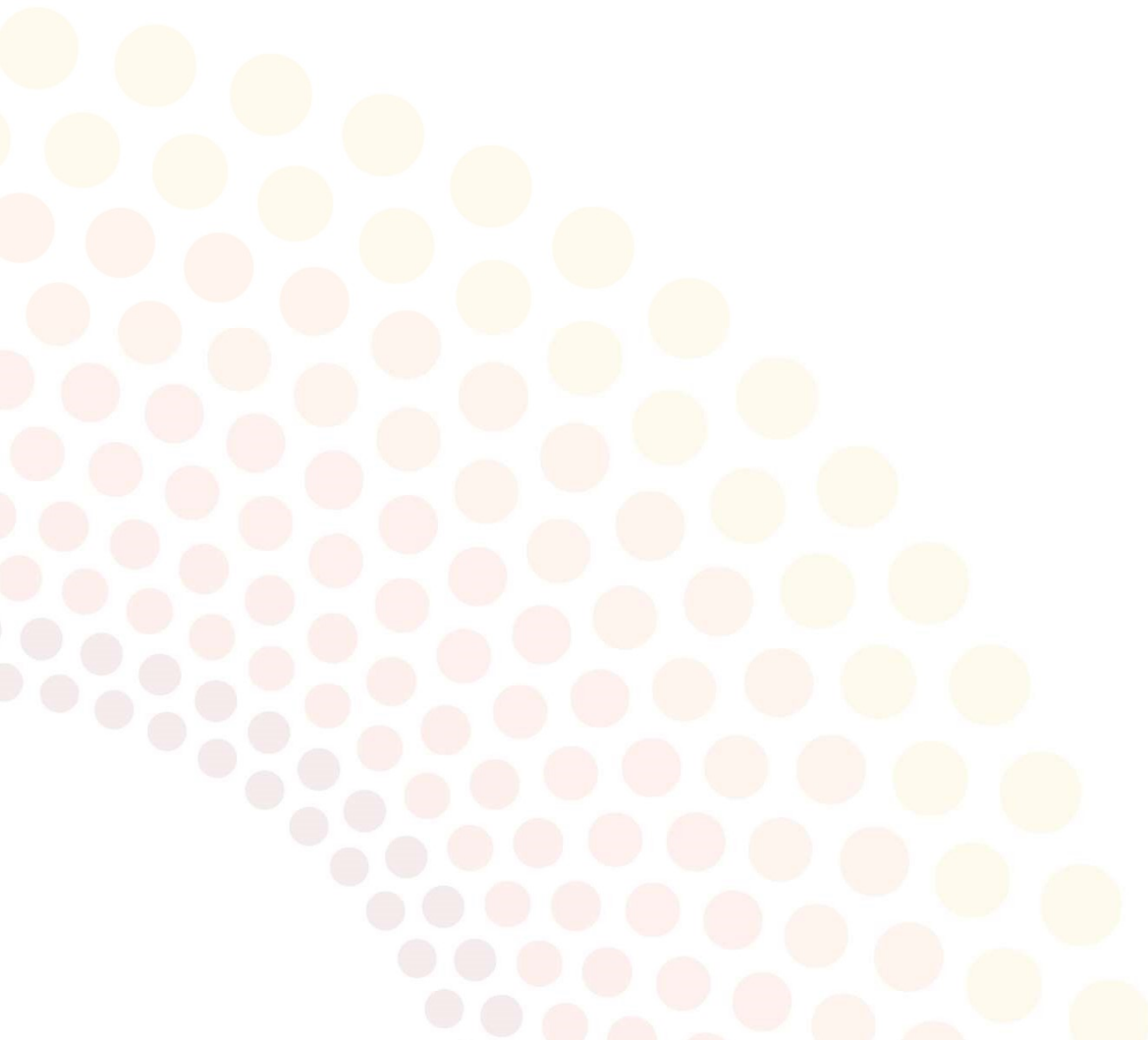
1    2    3    4    5

My beliefs about self-care are not reflected in my practise                  My beliefs about self-care match my practise

These reflections are helpful as they may identify some issues which you can work on to enhance your sense of wellbeing at work.

Take a moment to see how your peers have responded?

<https://docs.google.com/forms/d/e/1FAIpQLScUqzT3Y2X8teUns4SiJkA6bUB5mMcaLF9U-tOcaE4YYWo15w/viewform>



## Trauma-organised systems and parallel process

Sandra L. Bloom

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### Trauma-organised systems

This chapter takes a seemingly obvious but fundamentally radical position that organisations – including human service organisation – are, like individuals, living systems (Senge *et al.*, 2004). Being alive, they are vulnerable to stress, particularly chronic and repetitive stress. Chronic stress stealthily robs an organisation of basic interpersonal safety and trust and thereby robs an organisation of health. Organisations, like individuals, can be traumatized, and the result of traumatic experience can be as devastating for organisations as it is for individuals. As a result, many human service delivery networks are functioning as ‘trauma-organised systems’ (Bentovim, 1992).

The impact of chronic stress and adversity on organisations has thus far been minimized and denied, except in the most dramatic of circumstances. As a result, managers and leaders remain largely unaware of the multiple ways in which organisational adaptation to chronic stress creates a state of dysfunction, which in some cases virtually prohibits the proper delivery of services to the individual clients who are the source of the organisation’s original mission, while damaging many members of the organisation’s workforce. Just as the encroachment of trauma into the life of an individual client is an insidious process that turns the past into a nightmare, the present into a repetitive cycle of re-enactment and the future into a terminal illness; in a parallel way, chronic strain insidiously has an impact on an organisation. As seemingly logical reactions to difficult situations pile upon each other, no-one is able to truly perceive the fundamentally skewed and post-traumatic basic assumptions upon which that logic is built. As an earthquake can cause the foundations of a building to become unstable, even while the building still stands



apparently intact, so, too, does chronic repetitive stress destabilize the cognitive and affective foundations of shared meaning that is necessary for a group to function and stay whole.

### Parallel process

The concept of parallel process, taken out of the individual context and applied to organisations, is a useful way of offering a coherent framework that can enable organisational leaders and staff to develop a way of thinking 'outside the box' about what *has* happened and *is* happening to their service delivery systems, based on an understanding of the ways in which trauma and chronic adversity affect human function.

*When two or more systems – whether these consist of individuals, groups, or organisations – have significant relationships with one another, they tend to develop similar affects, cognition, and behaviours, which are defined as parallel processes. . . . Parallel processes can be set in motion in many ways, and once initiated leave no one immune from their influence (Smith et al., 1989, p.13).*

Clients bring their past history of traumatic experience into the social service sectors, consciously aware of certain specific goals but unconsciously struggling to recover from the pain and losses of the past. They are greeted by individual service providers, subject to their own personal life experiences, who are more or less deeply embedded in entire systems that are under significant stress. Given what we know about exposure to childhood adversity and other forms of traumatic experience, the majority of service providers have experiences in their background that may be quite similar to the life histories of their clients, and that similarity may be more or less recognized and worked through (Felitti et al., 1998).

The result of these complex interactions between traumatized clients, stressed staff, pressured organisations and a social and economic environment that is frequently hostile to the aims of recovery is often the opposite of what was intended. Staff in many treatment programmes suffer physical and psychological injuries at alarming rates and thus become demoralized and hostile. Their counter-aggressive responses to the aggression in their clients help to create punitive environments. Leaders become variously perplexed, overwhelmed,

ineffective, authoritarian or avoidant as they struggle to satisfy the demands of their superiors, to control their subordinates and to protect their clients. When professional staff and non-professionally trained staff gather together in an attempt to formulate an approach to complex problems, they are not on the same page. They share no common theoretical framework that informs problem solving. Without a shared way of understanding the problem, what passes as treatment may be little more than labelling, the prescription of medication, and behavioural management. When troubled clients fail to respond to these measures, they are labelled again, given more diagnoses and termed 'resistant to treatment'.

In this way, our systems inadvertently but frequently recapitulate the very experiences that have proved to be so toxic for the people we are supposed to help. Just as the lives of people exposed to repetitive and chronic trauma, abuse and maltreatment become organised around the traumatic experience, so too can entire systems become organised around the recurrent and severe stress of trying to cope with a flawed mental model based on individual pathology, which is the present underpinning of our helping systems. When this happens, it sets up an interactive dynamic that creates what are sometimes uncannily parallel processes.

Trauma theory brings context back to human services while integrating the importance of the biological discoveries of the last several decades. There are currently significant efforts directed at helping systems to become trauma-informed. The goal of this chapter is a practical one: to provide the beginnings of a coherent framework for organisational staff and leaders to more effectively provide trauma-informed care for their clients by becoming *trauma-sensitive* themselves. This means becoming sensitive to the ways in which clients, staff, managers, groups, policy makers, regulators and systems are impacted by individual and collective exposure to overwhelming stress and adversity.

### **When tragedy strikes: the impact of chronic stress and collective trauma**

When tragedy strikes, the whole organisation becomes traumatized, a collective experience that disaster researcher Kai Erikson termed 'collective trauma':

*... a blow to the basic tissues of social life that damages the*

*bonds attaching people together and impairs the prevailing sense of communality* (Erikson, 1994, p. 233).

Because we are group animals, we identify with the institutions to which we are affiliated. Patient deaths and injuries – from natural causes, accidents and, most particularly, suicide, and deaths while in restraints or the death of a child under the surveillance of child protection workers, staff deaths or injuries, loss of leaders, lawsuits, downsizing – all may overwhelm overall organisational function as well as every individual connected to the organisation. Just as individuals respond to acute stress and chronic stress in variable ways, so too can organisations experience the effects of both acute and chronic stressors. The effects of stress in organisations and within whole systems are cumulative. A series of small, unrelated, stress-inducing incidents can add up to a mountain of stress in the eyes of people who work in, and receive services within, these settings.

### **Lack of basic safety**

Workplaces that are experienced as fundamentally unsafe – physically and emotionally dangerous, untrustworthy environments – are experienced collectively as dangerous as well. When this occurs, the basic trust that supports complex problem solving and high productivity is eroded. The list of behaviours that can trigger mistrust in staff is a long one and includes both verbal and non-verbal behaviour: silence, glaring eye contact, abruptness, snubbing, insults, public humiliation, blaming, discrediting, aggressive and controlling behaviour, overtly threatening behaviour, yelling and shouting, public humiliation, angry outbursts, secretive decision making, indirect communication, lack of responsiveness to input, mixed messages, aloofness, unethical conduct – all can be experienced as abusive managerial or supervisory behaviour (Ryan and Oestreich, 1998). According to Bill Wilkerson, CEO of Global Business and Economic Roundtable on Addiction and Mental Health, mistrust, unfairness and vicious office politics are among the top 10 workplace stressors (Collie, 2004).

### **Loss of emotional management**

One group of investigators has argued that:

. . . emotions are among the primary determinants of behaviour at work . . . and profoundly influence both the social climate and the productivity of companies and organisations (Pekrun and Frese, 1992, p. 154).

Under normal conditions, an organisation manages and contains the emotional contagion that is an inevitable part of human group functioning through normal problem-solving, decision-making and conflict-resolution methods and group norms that must exist for any organisation to operate effectively. These are the norms that enable the group to tolerate the normal amount of anxiety that exists among people working on a task, tolerate uncertainty long enough for creative problem solutions to emerge, promote balanced and integrated decision making so that all essential points of view are synthesized, contain and resolve the inevitable conflicts that arise between members of a group, and complete its tasks (Bloom, 2004a).

In organisations under chronic, relentless stress, however, this healthier level of function is likely to be sacrificed in service of facing repetitive emergency situations, and entire organisations may begin to look like highly stressed individuals. Traumatized people often develop chronic hyperarousal as the central nervous system adapts to the constancy of threat. Similarly, organisations may become chronically hyperaroused, so that everything becomes a crisis. When this happens, the capacity to triage what is important and must be immediately attended to, and what can be postponed, is lost. Stress levels universally increase for everyone and, as one manager has said, 'It's like managing with your hair on fire'. Under conditions of chronic crisis, emotional distress escalates, tempers become short, decision making becomes impaired and driven by impulse, while pressures to conform reduce individual and group effectiveness (Ryan and Oestreich, 1998).

### **Dissociation and organisational amnesia**

Just like individuals, if they are to learn, organisations must have memory. Some modern philosophers believe that all memories are formed and organised within a collective context (Halbwachs, 1992). Organisational memory refers to stored information from an organisation's history that can be brought to bear on present decisions. Corporate knowledge, like individual knowledge, exists in two basic

forms: explicit knowledge, which is easily codified and shared asynchronously; and tacit knowledge, which is experiential, intuitive and communicated most effectively in face-to-face encounters. Explicit knowledge can be articulated with formal language. It is that which can be recorded and stored in the more concrete organisational storage bins: records, policies and procedure manuals, training curricula, orientation programmes, organisational structure and lines of authority, and other educational and written materials (Weick, 1979).

Tacit knowledge is that knowledge which is used to interpret the information – in clinical circles more commonly referred to as ‘clinical wisdom’. It is knowledge that is more difficult to articulate with language and lies in the values, beliefs and perspectives of the system (Lahaie, 2005; Othman and Hashim, 2004). Tacit knowledge resides within the individual memories of every person who is or has ever been a part of the organisation, is cumulative, slow to diffuse, is rooted in the human beings who comprise the organisation, and creates organisational culture. Every person who leaves an organisation takes a part of the organisational memory out the door with them. As a result, over time and with sufficient loss, the organisation may develop organisational amnesia that affects learning and adaptation (Kransdorff, 1998). Corporate amnesia becomes a tangible problem to be reckoned with when there is a loss of collective experience and accumulated skills through the trauma of excessive downsizing and layoffs (Newsbriefs, 2000).

The result of organisational amnesia may be a deafening silence about vital but troubling information, not dissimilar to the deafening silence that surrounds family secrets such as incest or domestic violence. There is reason to believe that maintaining silence about disturbing collective events may have the counter-effect of making the memory even more potent in its continuing influence on the individuals within the organisation as well as the organisation as a whole, much as silent traumatic memories continue to haunt traumatized individuals and families (Pennebaker *et al.*, 1997).

### **Organisational miscommunication**

Under increasing levels of organisational stress, the vital communication that is the lifeblood of an organisation starts to break down. As stress increases, perception narrows, more contextual information is lost and circumstances deteriorate to more extreme levels before

they are noticed, all of which leads to more puzzlement, less meaning and more perceived complexity. Communication is necessary to detect error and crises tend to create vertical communication structures when, in fact, lateral structures are often more appropriate for detection and diagnosis of problems. Research has shown that organisations are exceedingly complex systems that can easily drift toward disaster, unless they maintain resources that enable them to learn from unusual events in their routine functioning. When communication breaks down, this learning does not occur (Marcus and Nichols, 1999).

Organisations that already have poor communication structures are more likely to handle crises poorly (Kanter and Stein, 1992). Instead of increasing interpersonal communications, people in crisis are likely to resort to the excessive use of one-way forms of communication. Under stress, the supervisory structure tends to focus on the delivery of top-down information flow, largely characterized by new control measures about what staff and clients can and cannot do. Feedback loops erode under such circumstances and morale starts to decline as the measures that are communicated do not alleviate the stress or successfully resolve the crisis. Complex collective responses are all more vulnerable to this kind of disruption than are older, simpler, more over-learned, cultural and individual responses.

### **Increased authoritarianism**

When danger is real and present, effective leaders take charge and give commands that are obeyed by obedient followers, thus harnessing and directing the combined power of many individuals in service of group survival. When a crisis occurs, centralization of control is significantly increased, with leaders tightening reins, concentrating power at the top and minimizing participatory decision making (Kanter and Stein, 1992). Even where there are strong beliefs in the democratic way of life, there is always a tendency in institutions, and in the larger containing society, to regress to simple, hierarchical models of authority as a way of preserving a sense of security and stability. This is not just a phenomenon of leadership – in times of great uncertainty, everyone in the institution colludes to collectively bring into being authoritarian organisations, as a time-honoured method for providing at least the illusion of greater certainty, and therefore a diminution of anxiety (Lawrence, 1995).

However, when a state of crisis is prolonged, repetitive or chronic, there is a price to be paid. The tendency to develop increasingly authoritarian structures over time is particularly troublesome for complex organisations. Chronic crisis results in organisational climates that promote authoritarian behaviour, and this behaviour serves to reinforce existing hierarchies and create new ones. Communication exchanges change and become more formalized and top-down. Command hierarchies become less flexible, power becomes more centralized, people below stop communicating openly and, as a result, important information is lost from the system (Weick, 2001).

The centralization of authority means that those at the top of the hierarchy will be far more influential than those at the bottom, and yet better solutions to the existing problems may actually lie in the hands of those with less authority. Authoritarian leadership is likely to encourage the same leadership style throughout the organisation. The loss of democratic processes results in oversimplified decision making and the loss of empowerment at each organisational level reduces morale and increases interpersonal conflict.

As a result, the organisational norms for all staff are likely to endorse punitive behaviour, empathic failure and traditional methods for managing difficult situations. It is hard to imagine a situation more detrimental to long-lasting, positive change in the lives of people with complex problems. As for the staff, when authoritarian behaviour comes to dominate a situation, the result can also be devastating. Unchecked authoritarians can become bullies at any organisational level, but when they are given power they can become petty tyrants.

### **Silencing of dissent and organisational alexithymia**

The greater the authoritarian pressures in an organisation, and the greater the chronic stress, the greater is the likelihood that strenuous attempts will be made to silence dissent. Empirical data show that *organisational silence* emerges out of workers' fear to speak up about issues or problems they encounter at work (Morrison and Milliken, 2000). These underground topics become the undiscussables in an organisation, covering a wide range of areas, including decision-making, procedures, managerial incompetence, pay inequity, organisational inefficiencies and poor organisational performance (Ryan and Oestreich, 1998).

Dissent is even less welcome in environments characterized by chronic stress when dissent is seen as a threat to unified action. As a result, the quality of problem analysis and decision making deteriorates further. If this cycle is not stopped and the organisation allowed opportunity to recuperate, the result may be an organisation that becomes as rigid, repetitious and ultimately destructive as do so many chronically stressed individuals (Bloom, 2004b). Organisational alexithymia – the inability to give words to feelings – becomes a significant barrier to constructive change as the number of undiscussable topics accumulates. The silencing of dissent is dangerous to organisational and individual well-being, because dissent serves as corrective feedback within an organisation that can avert disaster if attended to in time.

### **Decision making and conflict management**

As systemic stress increases and authority becomes more centralized, organisational decision-making processes are likely to deteriorate, becoming less complex, more driven by impulse, with a narrowing of focus and attention only to immediate threat. Long-term consequences of decisions may not be considered and alternatives remain unexplored (Janis, 1982). As work-related stressors increase, employees develop negative perceptions of their co-workers and organisational leaders and this may precipitate serious decreases in job performance. Conflict over the content of task-related issues can be very useful, but emotion inevitably accompanies conflict and the heat of a conflict over issues can spill over into interpersonal conflict rather easily. Without good conflict management skills in the group, task-related conflict can lead to even more misunderstanding, miscommunication, and increased team dysfunction, instead of providing the kind of enriching discourse that can lead to creative problem solving. The bottom line is that if people in a group do not like and respect each other and spend their time in personal conflict, the group as a whole will perform badly. Chronic stress puts an added burden on old conflicts, which are likely to emerge with a vengeance and propagate new conflicts.

Hierarchical structures concentrate power and, in these circumstances, power can easily come to be used abusively and in a way that perpetuates rather than attenuates the concentration of power. Transparency disappears and secrecy increases under this influence. Communication networks become compromised as those in power



become more punishing, and the likelihood of error is increased as a result. In such a situation, conflicts tend to remain unresolved, tension and resentment mount under the surface of everyday group functioning. Interpersonal conflicts that were suppressed during the initial crisis return, often with a vengeance, but conflict resolution mechanisms, if ever in place, deteriorate under stress.

### **Disempowerment and learned helplessness**

Under these conditions, helplessness, passivity, and passive-aggressive behaviours on the part of the subordinates in the hierarchy increase, while leaders become increasingly controlling and punitive. In this way the organisation becomes ever more radically split, with different parts of the organisation assuming the role of managing and/or expressing different emotions that are then subsequently suppressed (Bloom, 2004a). Such conditions as these make an organisation ripe for collective disturbance that may go unresolved and unrecognized, while policy changes are made that ensure that the underlying conflicts will remain out of conscious group awareness.

Learned helplessness at work has been defined as a debilitating cognitive state in which individuals often possess the skills and abilities necessary to perform their jobs, but exhibit suboptimal or poor performance because they attribute prior failures to causes which they cannot change, even though success may be possible in the current environment (Campbell and Martinko, 1998). In a controlling, non-participatory environment exercising top-down management, every subsequent lower level of employee is likely to become progressively disempowered. After years, decades and even generations of controlling management styles, reversing this sense of disempowerment can be extremely difficult, particularly under conditions of chronic, unrelenting organisational stress. Helpless to protect themselves, feeling embattled, hopeless and helpless, the staff and management often engage in risky risk avoidance in which risk management policies prevent healthy change and adaptation.

### **Increased aggression**

The most feared form of workplace aggression is physical violence, but every episode of violence has a history. Violent physical or sexual assault in the workplace always emerges within a context and can usually be traced to various kinds of less appreciated forms of

violence that may occur routinely within an organisation. Dirty looks, defacing property, stealing, hiding needed resources, interrupting others, obscene gestures, cursing, yelling, threats, insults, sarcasm, the silent treatment, damning with faint praise, arbitrary and capricious decisions, ignoring input, unfair performance evaluations, showing up late for meetings, causing others to delay actions, spreading rumours, back-stabbing, belittling, failing to transmit information, failing to deny false rumours, failing to warn of potential danger – all of these actions on the part of management, staff and clients are forms of aggression which can terminate in the emergence of physical violence (Spector, 1997).

Stressful times are difficult for employees and as interpersonal conflict increases, it is likely that workers will express their anger, frustration and resentment in a variety of ways that have a negative effect on work performance. Frequently, bureaucracy is substituted for participatory agreement on necessary changes, and the more an organisation grows in size and complexity, the more likely this is to happen (Huberman, 1964). Research has demonstrated that the lower performance gets, the more punitive leaders become, and that very possibly just when leaders need to be instituting positive reinforcing behaviours to promote positive change, they instead become increasingly punitive (Sims, 1980).

A sure sign of an increase in aggression in the workplace is an escalation of vicious gossip and unsubstantiated rumour. Research shows that 70% of all organisational communication comes through this system of informal communication, and several national surveys have found that employees used the grapevine as a communication source more than any other vehicle (Crampton *et al.*, 1998). Not only that, but the grapevine has been shown to communicate information far more rapidly than formal systems of communication. Rumours fill in the gap where facts are absent and the grapevine may become poisoned by unsubstantiated rumour and gossip. All of this lends itself to the promotion of a toxic environment.

### **Unresolved grief, re-enactment and organisational decline**

Losses to the organisation are likely to be experienced individually as well as collectively (Carr, 2001). For the same reason, failures of the organisation to live up to whatever internalized ideal the individual has for the way that organisation should function are likely to be

experienced individually and collectively as a betrayal of trust, a loss of certainty and security, a disheartening collapse of meaning and purpose. Sudden firings or other departures of key personnel, the sudden death of a leader or otherwise influential employee, may be experienced as organisationally traumatic. The effects of downsizing, mergers, hostile takeovers, cuts in programme funding, changes in roles, increased and burdensome demands of insurance companies – all may be experienced as examples of more widespread chronic disasters (Erikson, 1994).

As workers in this field have determined:

*... the relationship between employee and organisation are: deep-seated, largely unconscious, intimately connected to the development of identity, and have emotional content (Carr, 2001, p. 429).*

Because of this connectedness between individual and collective identity, and because all change involves loss, organisational change and grieving tend to go hand-in-hand (Carr, 2001). It is clear that the ways in which grief, loss and termination are handled have a significant impact on employee attitudes. Unresolved grief can result in an idealization of what has been lost that interferes with adaptation to a new reality. The failure to grieve for the loss of a leader may make it difficult or impossible for a new leader to be accepted by the group. In fact, one author has noted that:

*Nostalgia is not a way of coming to terms with the past (as mourning or grief are) but an attempt to come to terms with the present (Gabriel, 1993, p. 132).*

Traumatized individuals are frequently subject to traumatic re-enactment, a compulsive reliving of a traumatic past that is not recognized as repetitive and yet which frequently leads to re-victimization experiences. Re-enactment is a sign of grief that is not resolved. Instead the trauma and the losses associated with it are experienced over and over, relentlessly. An organisation that cannot change, that cannot work through loss and move on, is likely to develop patterns of re-enactment, repeating past failed strategies without recognizing that these strategies may no longer be effective. This can easily lead to organisational patterns that become overtly abusive.

The rigid repetition of the past and the inability to adapt to change may lead to organisational decline and, possibly, dissolution. Increases in conflict, secrecy, scapegoating, self-protective behaviours, loss of leader credibility, rigidity, turnover, decreases in morale, diminished innovation, lowered participation, non-prioritized cuts and reduced long-term planning are common problems associated with periods of decline (Cameron *et al.*, 1987). All of these behaviours can be seen as inhibitors of organisational learning and adaptation.

### Conclusion

Organisational change is always challenging and all too frequently fails (Pascale *et al.*, 2000). But constant and rapid adaptation to a rapidly changing environment has become a basic necessity for organisational survival. In treating individual survivors of traumatic life events and sustained adversity, it has become clear that having a different way to assess and formulate past and current dilemmas is frequently the beginning of a healing and even transformative process (Bloom, 1997). This chapter entertains the possibility that, if members of organisations can similarly adopt a trauma-informed mental model that enables them to collectively assess and constructively respond to recurrent stress in a different way, transformative organisational change may be possible.

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# Managing Trauma in the Workplace

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Supporting workers and  
organisations

Edited by Noreen Tehrani

 **Routledge**  
Taylor & Francis Group  
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# Ideas for self-care

<b>Traditional things</b>	Take time out to participate in traditional activities Go home to community Practice your spiritual understanding of the world
<b>Recreational things</b>	Take time out to participate in an enjoyable activity Listen to music Meditation, yoga, breathing exercises Go for a walk with a friend/dog Have a regular massage
<b>Social things</b>	Share knowledge Learn new things Have a close personal support network Spend time with family Visit friends Eat well, go out for dinner Laugh
<b>Domestic personal things</b>	Take a nap Turn off the phone, lights, TV; spend time alone Do not answer the door Enjoy a movie or favourite TV show Go for a long drive Gardening Have regular medical checks Practice healthy living (i.e., do not smoke, drink, use illicit drugs)
<b>Work-related things</b>	Have a coffee and debrief informally with work mates Have a routine Take one day at a time Consider things from another perspective Accept your limitations Look forward to the end of the working day; do not take work home.



### Leadership Development Tool

Leadership Functions	Professional Development Areas	Self-reflections
Know oneself as a leader	<ul style="list-style-type: none"> <li>• Willingness to learn (we invest early in self-development or we pay later for our blind spots and skills gaps)</li> <li>• Awareness of own history, strengths, and blind spots</li> <li>• Recognition of one’s own capacities and willingness to stretch</li> </ul>	
Act as role model for staff and board members	<ul style="list-style-type: none"> <li>• Skill in engaging others in learning process</li> <li>• Openness to sharing one’s own learning challenges and successes</li> </ul>	
Identify suffering and name organizational traumatization	<ul style="list-style-type: none"> <li>• Understanding of differences between organizational lifecycle development, crisis situations, and organizational trauma/traumatization</li> <li>• Familiarity with concepts of organizational trauma and traumatization</li> <li>• Familiarity with secondary traumatic stress and vicarious traumatization</li> <li>• Skill in recognizing dynamics of individual and organizational distress</li> </ul>	
Contain impacts of traumatization	<ul style="list-style-type: none"> <li>• Understanding of non-anxious leadership</li> <li>• Skill at recognizing when “hooked”</li> </ul>	
Offer optimism, confidence, and energy	<ul style="list-style-type: none"> <li>• Ability to nurture an optimistic attitude</li> <li>• Skill at employing self-care techniques that rejuvenate energy and spirit</li> </ul>	
Provide frameworks for analysis and meaning making	<ul style="list-style-type: none"> <li>• Skill at structuring conversations that are open, curious, and compassionate</li> <li>• Skill in applying concepts to understand dynamics and patterns</li> <li>• Ability to set and maintain healthy boundaries</li> <li>• Practice of reflection in action (“going to the balcony”)</li> </ul>	

Champion organizational strengths	<ul style="list-style-type: none"><li>• Familiarity with strengths-based approaches</li><li>• Ability to see your own and others' strengths</li><li>• Skill at providing an positive context for conversations and work</li></ul>	
Model kindness and compassion	<ul style="list-style-type: none"><li>• Practice of empathic and nonjudgmental listening</li><li>• Practice of mindfulness techniques</li><li>• Know the difference between "kind" and "nice"</li></ul>	
Ask for outside help when necessary	<ul style="list-style-type: none"><li>• Recognition of positive and negative influences regarding asking for help</li><li>• Recognition of "in over my head" danger signals</li></ul>	
	@Vivian and Hormann 2012	

## *Mindful Breathing:*

### Cloud Breaths

Sit down comfortably.

Breathe in through your nose as you raise your hands over your head.

Imagine your hands are scooping up puffs of clouds into one big puffy cloud. Hold your breath for 2 counts.

Let your arms go down by your side and breathe out through your mouth as you blow your cloud up, up, up into the sky! Repeat this 4 to 8 times.

### Finger Breaths

Touch your thumb and index finger together and slowly breathe in through your nose. Then breathe out through your mouth.

Touch your thumb and middle finger together and slowly breathe in through your nose. Then breathe out through your mouth.

Touch your thumb and ring finger together and slowly breathe in through your nose. Then breathe out through your mouth.

Touch your thumb and pinky finger together and slowly breathe in through your nose. Then breathe out through your mouth.

Repeat this, but now going back the opposite way! Stretch your fingers out wide and RELAX!

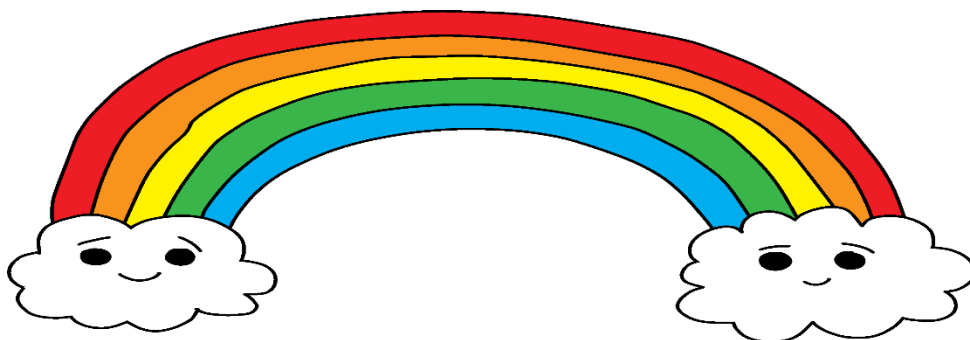
### Breathe a Rainbow of Colours

Start by slowly circling a cloud with your finger as you breathe in through your nose.

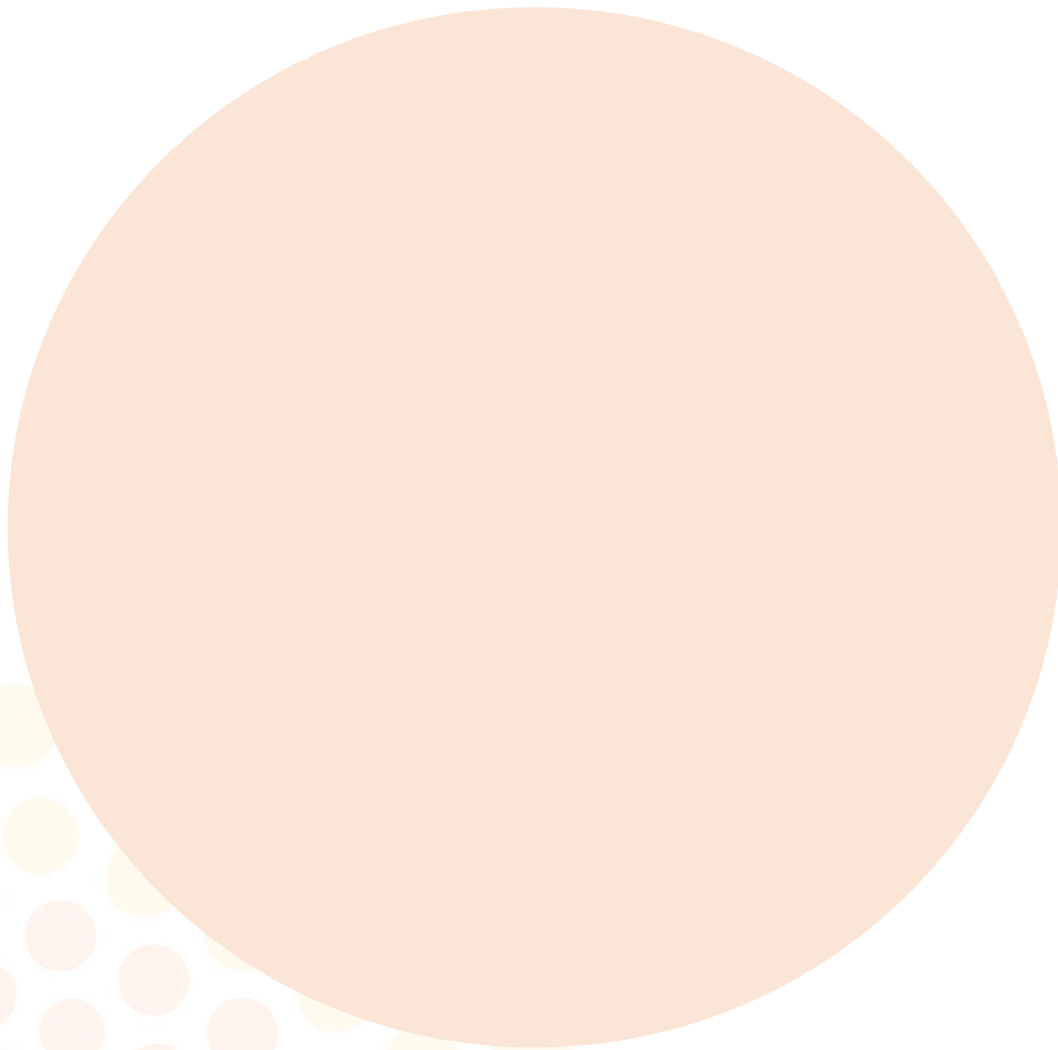
Next, slowly breathe out through your mouth and trace the red band of the rainbow. Circle the other cloud with your finger as you breathe in through your nose. Then, as you breathe out through your mouth, slowly trace the orange band of the rainbow back the other way. Repeat for the yellow, green, and blue bands.

Take one more big breath in through your mouth and imagine you are breathing in all the colors of the rainbow. Now slowly breathe them out through your mouth.

Breathe in your favourite colour and breathe out your worries.



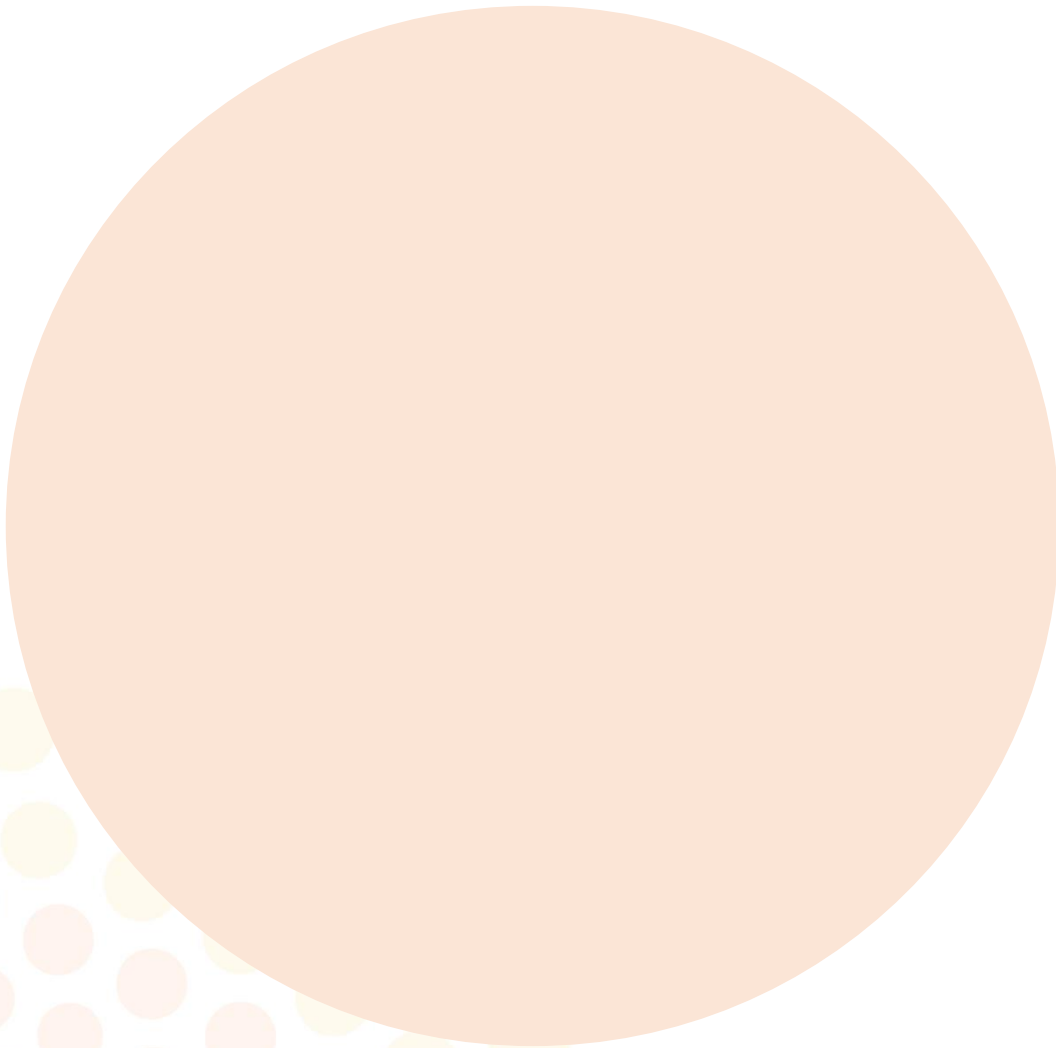
## Pie Graph: Current distribution of supervision tasks



### Supervision Tasks:

- Set up learning relationship
- Teach
- Evaluate
- Monitor Ethical Issues
- Counsel
- Consult
- Monitor Administrative aspects

## Pie Graph: Ideal distribution of supervision tasks

**Supervision Tasks:**

- Set up learning relationship
- Teach
- Evaluate
- Monitor Ethical Issues
- Counsel
- Consult
- Monitor Administrative aspects

Resource

Activity



## Possible impacts of vicarious trauma

	Personally	Professionally	Organisationally
Physically	<ul style="list-style-type: none"> <li>Fatigued</li> <li>Hypervigilance</li> <li>Impaired immune system</li> <li>Rapid heartbeat</li> <li>Changes in breathing</li> <li>Sleep &amp; appetite disturbances</li> </ul>	<ul style="list-style-type: none"> <li>Lack of concentration</li> <li>Use of negative coping mechanisms</li> <li>Difficulty in “switching off”</li> </ul>	<ul style="list-style-type: none"> <li>Increased absenteeism &amp; sick leave</li> <li>Being late</li> </ul>
Sensorily	<ul style="list-style-type: none"> <li>Flashbacks</li> <li>Sensory overload</li> </ul>	<ul style="list-style-type: none"> <li>Dissociation</li> </ul>	<ul style="list-style-type: none"> <li>Negative sense of workplace</li> </ul>
Emotionally	<ul style="list-style-type: none"> <li>Powerlessness</li> <li>Anxiety</li> <li>Guilt</li> <li>Fear</li> <li>Sadness</li> <li>Shut down</li> <li>Hopelessness</li> <li>Mistrust</li> </ul>	<ul style="list-style-type: none"> <li>Lack of satisfaction with work</li> <li>Diminished empathy</li> </ul>	<ul style="list-style-type: none"> <li>Apathy</li> <li>Detachment or over attachment to organisation</li> </ul>
Cognitively	<ul style="list-style-type: none"> <li>Self-doubt</li> <li>Isolation from friends and family</li> <li>Loss of interest in a range of tasks, hobbies &amp; life</li> </ul>	<ul style="list-style-type: none"> <li>Projection</li> <li>Counter transference</li> <li>Increased mistakes</li> <li>Withdrawal from colleagues</li> </ul>	<ul style="list-style-type: none"> <li>Low morale</li> <li>Staff conflict</li> <li>Irresponsible practice</li> <li>Negative attitude</li> <li>Constant questioning of work</li> </ul>
Reflectively	<ul style="list-style-type: none"> <li>Decreased self esteem</li> <li>Questioning core beliefs and meaning of life</li> </ul>	<ul style="list-style-type: none"> <li>Reduced reflective capacity</li> <li>Poor communication</li> <li>Decreased confidence</li> <li>Setting perfectionist standards</li> </ul>	<ul style="list-style-type: none"> <li>Faulty judgements</li> <li>Avoidance of organizational tasks</li> </ul>

# Sensory Preferences Guidance

Please remember that everyone's sensory patterns are individual to them. What makes one person feel calmer may upset another person. Get as much information as you can from the team, and your own observations to help tailor your strategies.

These are some of the most frequent calmers and triggers:

Sense	Calming Strategies	Potential Triggers
Vision	Picture of loved ones, sand timer, picture of (or actual) nature.	Flashing lights, lots of movement, visual clutter.
Hearing.	Favourite music, sound-cancelling headphones or earmuffs, nature sounds	Loud unexpected noise, background noise, particular pitch of music, poor acoustics
Taste	Favourite flavours. These may include salty, mint, sweet, bitter etc. Chewing gum.	Almost any flavour COULD be overwhelming
Touch	Soft fabric to touch, a hug, fidget toy, chew toy, tactile flooring, smooth pebbles.	. Sunscreen, unexpected/accidental touch, tickles, clothing and hats, food textures.
Smell	Lavender, vanilla, mint, mother's scent. Take care as this area is very individual.	Almost any smell COULD be overwhelming.
Vestibular	Rhythmic swinging or rocking, jumping on a trampoline, turning self upside down, spinning, fast movement, wobble cushion. Balance board	Fast movement, feet off the floor, being out of control of speed or direction of movement
Proprioception,	Heavy work and deep pressure, such as weight through arms and shoulders, big movement activities, carrying, hitting with bat or racquet, punching, pouring, digging, big hugs, squeezing into small spaces, chewing, fidget object, stress ball. Weighted backpack/cushions.	Certain movements. Proprioceptive input is more likely to calm than upset.

Interoception	Breathing exercises, focus on heart rate, fulfilling hunger or thirst, using the toilet, adding or removing clothes with support.	May react more strongly to pain than others. May not be aware of body temperature, hunger, thirst or need to toilet, leading to overall discomfort
All.	Quiet spaces to get away	Too much sensory input



## How Trauma Lingers in the Body



We look for the story the body is telling.



What story is your body telling?

# Indigenous Knowledge in a Postgenomic Landscape: The Politics of Epigenetic Hope and Reparation in Australia

Science, Technology, & Human Values  
1-25

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## Abstract

A history of colonization inflicts psychological, physical, and structural disadvantages that endure across generations. For an increasing number of Indigenous Australians, environmental epigenetics offers an important explanatory framework that links the social past with the biological present, providing a culturally relevant way of understanding the various inter-generational effects of historical trauma. In this paper, we critically examine the strategic uptake of environmental epigenetics by Indigenous researchers

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and policy advocates. We focus on the relationship between epigenetic processes and Indigenous views of Country and health—views that locate health not in individual bodies but within relational contexts of Indigenous ontologies that embody interconnected environments of kin/animals/matter/bodies across time and space. This drawing together of Indigenous experience and epigenetic knowledge has strengthened calls for action including state-supported calls for financial reparations. We examine the consequences of this reimagining of disease responsibility in the context of “strategic biological essentialism,” a distinct form of biopolitics that, in this case, incorporates environmental determinism. We conclude that the shaping of the right to protection from biosocial injury is potentially empowering but also has the capacity to conceal forms of governance through claimants’ identification as “damaged,” thus furthering State justification of biopolitical intervention in Indigenous lives.

### **Keywords**

biopolitical economy of hope, Indigenous Australians, environmental epigenetics, strategic biological essentialism, biosocial damage

### **Introduction**

It is well-documented that Indigenous peoples around the world have consistently rejected genetic research for ethical, cultural, and political reasons (Reardon and TallBear 2012; Kowal 2016). Genetic research conducted on “socially identifiable” populations can reinforce essentialist biological concepts of race (Foster, Bernsten, and Carter 1998; Tsosie 2007), and Indigenous populations have raised concerns over issues of consent, cultural ownership, the use (and abuse) of DNA and other bodily products, and the many differences between scientific and Indigenous understandings of bodies and kinship (Dodson and Williamson 1999; Reardon 2005; TallBear 2007; Garrison 2013; Hook 2009). In Australia, these concerns occur in a historical context where Indigenous people have been the focus of biological research that supported scientific claims of inferiority, the “doomed race” theory, and, later, policies of assimilation that removed children of “mixed” ancestry from their families (Anderson 2002; Human Rights and Equal Opportunity Commission [HREOC] 1997; McGregor 1997). Due to this fraught history, Indigenous Australians have, until recently, remained cautious about genetic and genomic research, and so very limited research has been conducted in this population (Kowal 2013).

In sharp contrast to this resistance to genetic research, the recent rise of epigenetics has been embraced by Indigenous peoples in Australia, New Zealand, Canada, and the United States. Over the last five to ten years, there has been a remarkable increase in the use of environmental epigenetics<sup>1</sup> as an explanatory framework that draws upon the relationship between biological mechanisms and social lives to understand ongoing intergenerational Indigenous disadvantage and ill-health (Kowal 2016; Kowal and Warin 2018). Aboriginal and Torres Strait Islander Australians (hereafter Indigenous Australians) remain the least healthy population group in Australia (Australian Institute of Health and Welfare 2015), and it is well-documented that rapid cultural destruction, coupled with decades of slow violence in the form of government policies and marginalization from mainstream society, is to blame (Atkinson, Nelson, and Atkinson 2010; Boulton 2016).

This paper argues that the uptake of Indigenous epigenetics in Australia points to a “political economy of hope” among those that produce and consume biological knowledge (Rose and Novas 2005; Petersen 2015). In this variation of Rose and Novas’s concept, biology is no longer a blind destiny but mutable, improvable, and potentially reversible. Epigenetics introduces a distinctive pathway to this view of the biological as a hopeful domain open to environmental and structural intervention and manipulation, a pathway that expands the potential sources and mechanisms of intervention in Indigenous people’s lives.

We begin our exploration into this particular bioeconomy of hope with a vignette describing an event where a prominent Indigenous academic used the concept of epigenetics to frame Aboriginal health in an optimistic light (in comparison to the negative framing of “deficit discourse,” Fogarty et al. 2018). This framing is paradigmatic of the collective narrative of hope, co-constituted by Indigenous histories, environmental epigenetics, and health that we examine in this paper.

Following a description of the study, we broaden the argument by describing how the molecular embodiment of colonial oppression provides a biological explanation for the intergenerational transmission of historical trauma. Moreover, we suggest that epigenetics is an appealing conduit for this discourse as it reconfigures singular and bounded concepts of the environment and personhood toward more dynamic and relational models. For many Indigenous people, personhood is not located in individuals but known in relation to other persons, Country, and across time and space. Epigenetics appears to correspond to Indigenous aspirations, to foster legal and human rights, and to reflect Indigenous knowledges. Thus, in the context that we write about, dominant (and counterhegemonic) Indigenous

conceptions of personhood align with epigenetics and reinforce each other. As we explore, epigenetics is used in specific ways in the biopolitical economy of hope surrounding Indigenous health discourses. The uncertainty of the science, particularly surrounding the reversibility of epigenetic changes and their transgenerational inheritance, is, however, generally overlooked. The alignment of epigenetics and Indigenous knowledge is therefore provisional, dependent on features of human epigenetic change and inheritance that are not yet clear in the scientific literature.

In the final sections, we question whether the humanitarian usage of epigenetics to reinforce notions of acquired multigenerational bio-injury as a platform for political reparations may give rise to new forms of biollegitimacy (Fassin 2000, 2009) in which the epigenetic body is used as an historical testimony of colonial violence.<sup>2</sup>

In our argument, we coin the term *strategic biological essentialism* to understand the biological turn in the representation of Indigenous rights. Strategic essentialism, a term attributed to Spivak, describes the process by which a minority group represents particular qualities as (culturally or biologically) inherent to the group in order to foster claims for social justice and rights. A strategically essentialist claim strategically overlooks the fact that qualities (e.g., connection to land or vulnerability to the state) are not homogeneously shared across groups: qualities are represented as inherent in what Spivak ([1985] 1996) describes as “a scrupulously visible political interest” (p. 214).

In the case of Indigenous epigenetics, we point to the limitations of strategic biological essentialism. Enacting forms of citizenship through identification with a history of biosocial deprivation may not only lead to intensified biopolitical attention from the State but also consolidate quasi-essentialist notions of specific biological difference among certain populations seen as epigenetically different (e.g., with distinctive methylation profiles as a result of their prolonged exposures to pathogenic environments, Mansfield 2012, 2017; Meloni 2016). In conclusion, we argue that while epigenetics offers a bioeconomy of hope that the effects of settler colonialism can be recognized and reversed, the conjunction of epigenetics and Indigenous knowledges may lead to new forms of biollegitimacy that reproduce essentialisms.

## **Epigenetics and the Political Economy of Hope**

In “The Politics of Life Itself,” N. Rose (2007) suggests that a defining feature of contemporary power in advanced liberal democracies is

governance through freedom within a political economy of hope. A political economy of hope involves a grassroots and collaborative approach to the promises of new biomedical technologies such as the molecular links between environmental factors and chronic disease in epigenetic research. Such political projects, as Rose and Novas (2005) argue, engender new forms of biological citizenship and biosociality in which patients and communities advocate for greater awareness and improved services in collaboration with medical experts, pharmaceutical companies, and government bodies.

A version of this biopolitics of hope was recently demonstrated by a plenary speaker at an Australian conference on the developmental origins of health and disease (DOHaD) and epigenetics. DOHaD is now an international field of research that focuses on the epidemiological associations between maternal health, prenatal, and intrauterine fetal development and susceptibility to chronic disease in adult life (Warin et al. 2011). Professor Sandra Eades (2015), a Noongar woman from Mt. Barker, Western Australia, medical doctor and eminent health researcher, presented on “life course and epigenetics.” She warned the predominantly clinical audience that her presentation was going to be different: “I want to tell you a rambling story of how I make sense of life course and DOHaD and that might contribute to Indigenous health over time.” She immediately positioned her Indigeneity alongside DOHaD and epigenetics. “This is a story about history” she said, “but not my life from birth to death, this is about life course across many people’s lives—and this fits with the DOHaD story.” Drawing from numerous federally funded medical studies that she has led and been involved in as a biomedical researcher, she talked about the problems of obesity, diabetes, and cardiovascular diseases in many Indigenous Australian communities. She recounted research demonstrating that maternal stress shortens the telomere length in offspring (telomeres are the “caps” at the end of chromosomes and their length is associated with aging and cancer) and how exposures such as smoking or poor nutrition in pregnancy effects DNA methylation, birth weight of babies, and adult onset disease across generations.

Eades juxtaposed her discussion of these scientific findings within her own biography, tracing intergenerational transmission of noncommunicable diseases by showing photographs of her family members. She couched her biography in terms of cycles of disease risk that weaved in and out of bodies over several generations, pointing to positive changes in her mother’s and her own generation—such as eating simple foods incorporating bush tucker (traditional foods)—that have reversed biological mechanisms and

produced resilience to ill-health. She concluded by returning to the theme of the conference: “We really are linked to our past—through mechanisms such as epigenetics, microbiomes, telomeres & others . . . [I’m giving you] a cyclical view of health across generations and science is catching up with that spiritual view of health” (Eades 2015). In response to her presentation, a British Australian geneticist from the audience suggested that “epigenetics is almost a plausibility [*sic*] of what Aboriginal people have known for thousands of years.” In this statement, he privileged Indigenous knowledges and portrayed Western science as belatedly “catching up,” inverting the hierarchy that usually organizes and prioritizes data and knowledge at a scientific meeting.

While the congruence between child development and Indigenous knowledge has been demonstrated through previous initiatives such as the Strong Women/Strong Babies/Strong Culture program of the 1990s, (for an overview of this program, see <http://www.healthinfor.net.ecu.edu.au/key-resources/programs-projects?pid=357> and Lea 2008) what was striking about this presentation was not just the positioning of Indigenous knowledges alongside molecular biology but the embodiment of these differing epistemologies and ontologies through Sandra’s multigenerational biography and biology. She spoke to relations of kin and ancestry, of Country, of time and place, of histories, of loss of land, and of multiple bodies enfolded through multiple times and spaces. She drew direct reference to these formulations of biography and biology within the political economy of hope engendered in postgenomic sciences—the hope that the adoption of healthy lifestyles, improved social determinants such as Indigenous education and housing, and cultural resilience can have positive, intergenerational biological effects.

It was Eades’s use of epigenetics to frame her notion of intergenerational Indigenous health that led us to further investigate emerging forms of biopolitics constituted through Indigenous epigenetics. This paper draws on our experiences of participating in these genetic, epigenetic, and DOHaD forums (conferences, seminars, workshops); analysis of relevant media, policy, and reports; and five key informant interviews conducted in 2016 by Warin.<sup>3</sup> Interviewees included Indigenous and non-Indigenous Australian researchers working directly in Indigenous epigenetics and DOHaD (on neurodevelopment, pregnancy and nutrition, fetal alcohol syndrome, and genetics). The focus of these interviews was to explore whether and how Indigenous and scientific epistemologies intersect within DOHaD and epigenetic research. Snowball sampling was used to identify potential participants across Australia, and informed consent was obtained for

semistructured interviews that took place in person or via telephone. Two of the interviewees identified as Indigenous Australians, and all were conducting research through Australian universities (in collaboration with government Departments of Health, Aboriginal Primary Health Care, and Indigenous Community Health).

Before going further, it is important to note that (as one of our interviewees explained) epigenetics is not a word you will hear “on the ground” in Indigenous communities; there is as yet, no “everyday of epigenetics” (Pentecost 2016). Currently, it is predominantly Indigenous academics, Indigenous Health Organizations, and medical bodies that are advocating epigenetics as a tool to understand Indigenous health. However, we still consider it useful to analyze these nascent discourses before they disseminate further into Indigenous health practice and policy.

The authors of this paper do not identify as Indigenous, and we are mindful that there are certain cultural and gendered knowledges/practices that are not appropriate to explore or publish. As a medical anthropologist, Warin has a decade of experience working in a life-course research group and more recently with Indigenous and non-Indigenous researchers on urban Indigenous experiences of food and pregnancy in an Australian metropolitan city. Kowal is also a medical/cultural anthropologist and a physician who has two decades of experience working in Indigenous health research and has long-standing research expertise in the area of genetics and Indigenous Australians, and Meloni has international expertise in the historical, ethical, and biopolitical implications of epigenetics.

## **The Molecular Embodiment of Historical Trauma**

In academia and among health activists, constructs of historical trauma have proliferated in the last two decades, in the context of growing legitimation of notions of trauma and victimhood (Fassin and Rechtman 2009; Niezen 2013). The concept of historical trauma is often used to “describe the impact of colonization, cultural suppression, and historical oppression of many Indigenous peoples” (Kirmayer, Gone, and Moses 2014, 300; Lock 2015). It is widely acknowledged that Indigenous Australians have experienced trauma as a result of colonization, and in many Indigenous families and communities, the effects of this trauma continue to be passed from generation to generation (Atkinson, Nelson, and Atkinson 2010).

Within health research (including Indigenous health), historical trauma has been most clearly embraced by those affiliated with the social determinants of health and explored through the lens of racism (Carson et al. 2007;



Berkman and Kawachi 2000; Kuzawa and Sweet 2009, Krieger 2003; Paradies et al. 2015). All of the interviewees recognized these close links between historical trauma, racism, and poor Indigenous health. One researcher who has worked in remote and urban Indigenous settings commented: “there is so much trauma going on in present day communities and Indigenous people have long talked about it being as a result of many past atrocities and traumatic experiences.”

In the last five to ten years, understandings of the effects of trauma on the health of Indigenous people in Australia and other First Nation peoples (in the United States, New Zealand, and Canada) have expanded to incorporate epigenetics and epigenetic-inspired models, significantly broadening the ways in which trauma is embedded in the body. For example, in their work on historical trauma among Indigenous Americans and Alaskans, Walters and colleagues (2011) state that “scholars [are now pointing] to the amassing of evidence at the cellular level that powerful stressful environmental conditions can leave an imprint or ‘mark’ on the epigenome (cellular genetic material) at key development periods, that can be carried into future generations with devastating consequences” (p. 11).

Recent Australian reports on intergenerational trauma and its effects have begun to incorporate epigenetics. Boulton (2016), for example, suggests that in Australia, “there is emerging evidence that intergenerational patterns are in part mediated through epigenetic factors . . . in relation to response to stress . . . malnutrition . . . central adiposity . . . diabetes . . . [and] cardiovascular disease” (p. 3), which must be contextualized within the historical frame of colonization. The enfolding of structural violence and trauma into individual and collective bodies is referred to by one Indigenous Australian scholar, who draws explicitly on US epigeneticist Michael Skinner’s work, as “communal wounds” (Gilbert 2017). The molecular embodiment of historical trauma thus shores up what (as one interviewee said)—“Aboriginal peoples have known for years” that past injustices are embodied collectively and passed on through generations via poor mental and physical health, addiction, and violence. Epigenetics is therefore, as another interviewee put it, “consistent with Indigenous knowledge systems.”

At a recent presentation at the Lowitja Institute’s<sup>4</sup> International Indigenous Health and Wellbeing Conference in Melbourne, one of the invited keynote speakers (Indigenous scholar professor Katrina Walters, a member of the Oklahoma Choctaw Nation) metaphorically represented historical trauma as the embodiment of both the breeze that blows over generations and the water that the ancestors carry in all of their bodies across generations. Drawing explicitly on DOHaD and epigenetic discourses, she moved

beyond a static model of bodies to one of epigenetic memories in which “our bodies, our minds, our spirits are inextricably linked across the flows of time, space and place” (Walters 2016). Historical trauma, she said, is “not something innate to our biology but something we accumulate over our lifetime and over our ancestors’ lifetimes as well” (Walters 2016). Despite Walters’s claim that trauma is “not innate to our biology,” we consider her notion of bodies shaped by trauma as a novel form of biopolitics. Once accumulated in the body, trauma becomes innate to local Indigenous biologies (Lock 2015), transmitted to future generations.

This accumulation of biosocial injury across generations is now appearing in Indigenous Australian health research and reported in official government documents, with epigenetics cited as further evidence for new interventions and urgent action. The Australian “First 1000 Days” organization provides an example. Internationally, the movement promotes optimum nutrition in pregnancy and early childhood to minimize future disease (UNICEF, n.d.). The Australian First 1000 Days model is Indigenous led and explicitly embraces concepts of historical trauma, DOHaD, and epigenetics in order to make claims about rights, social justice, equity, and embodied, multigenerational damage. This program is supported by a discourse of hope. Led by the chair of the council and Research Advisory Committee, Torres Strait Islander woman professor Kerry Arabena, the Australian First 1000 Days team state that “this is what hope can look like” and foregrounds the “need to be healed from the experiences of dispossession and colonization and the intergenerational impacts of poorly designed and executed policies” as a key aspect of providing good antenatal and early childhood environments (Arabena, Panozzo, and Ritte 2016, 28). Interviewees in our study pointed to recent policy documents from National Aboriginal Community Controlled Health Organisation (NACCHO 2013) and the National Health and Medical Research Council forum on research translation in Aboriginal and Torres Strait Islander health (2016), which identify epigenetics as a priority policy area (see also Australian Medical Association 2013). The head of the national peak body for Indigenous-controlled health services has stated that “epigenetic modifications can be passed from mother to child, with implications for the health of immediate and subsequent generations” (Australian Government 2016).

These links between epigenetics and Indigenous health, expressed by the most senior and influential Indigenous health researchers and leaders, embrace a specific representation of epigenetic science. The popularity of epigenetics within Indigenous health discourses is not matched by the nascent state of the science, a version of “epigenetic hype” seen more generally

(Häfner and Lund 2016; Deichmann 2016). In particular, two aspects of epigenetics—transgenerational inheritance and reversibility—are much more controversial and contingent than one would suspect from Indigenous health reports and presentations from Indigenous researchers. It is well established that epigenetic changes have intergenerational effects through two mechanisms: direct parental effects on the gametes or fetus or grandparental effects via the ova of the female fetus. However, transgenerational inheritance—that is, inherited epigenetics effects in the absence of exposure—is controversial. Evidence that epigenetic effects can be transgenerationally inherited in humans is highly contested, although this is considered to have been established in nonhuman animal models (for an overview, see Hanson and Skinner 2016). Despite this, claims of the role of epigenetics in intergenerational trauma generally assume that epigenetic changes are transmitted beyond one or two generations (e.g., Walters et al. 2011). Second, discourses of epigenetics in Indigenous health imply that epigenetic changes are reversible through interventions and that these changes can be sustained through time—both claims that are currently scientifically unclear. Epigenetic profiles differ between cells, organs, and across time, complicating efforts to design and evaluate epigenetic interventions (Kundaje et al. 2015; National Human Genome Research Institute).

Rather than inaccurate or just premature, the representation of epigenetics as uncontroversially transgenerational and reversible is best understood as the rationality underlying the bioeconomy of hope surrounding Indigenous health discourses. In the next section, we explore further the apparent congruence between epigenetics and Indigenous knowledges.

## **The Openness of Epigenetic Environments and Indigenous Ontologies**

The entanglement of social and biological environments and the porousness of bodies to the effects of historical trauma are key elements of the appeal of epigenetic discourses for Indigenous people. Although “the environment” is by no means a singular term in the social and life sciences and has a complex history (Pearce 2010; Warin and Martin 2018), epigenetics challenges us to rethink prevailing body/environment configurations that have become mainstream in the West since the making of the modern body of biomedicine (Cohen 2009). While a full compartmentalization of the body from the environment was more an ideal than a reality in biomedical practice (Nash 2006), especially in the colonies (Anderson 2006), and theories

of disease have always involved penetration of bodily boundaries before and after the rise of the modernistic body of biomedicine, the idea of an impermeability and stability of hereditary material has been an established dogma since the late nineteenth century (after Weismann and the rise of genetics, see Meloni 2016). This notion (which took place at the same time as the rise of germ theory) contributed to a shift in the locus of causation in etiological theories from the outside to the inside of the body, supporting a view of a stable and insulated biological individuality in which each individual possessed, from birth to death, unique genetic material walled off from environmental signals (Buss 1987; Gilbert, Sapp, and Tauber 2012).

In as much as a gene could interact with a certain environment in an interactionist view of genetics, a neat distinction between these two factors was never seriously in question during the twentieth century. Epigenetics, and the wider notion of a “reactive genome” that cannot be completely distinguished from its environment (Keller 2015), represents a profound disturbance for these ideas of an immured and invariable genomic code and hence for wider notions of the body as distinct from the environment (Lock 2015).

Another way to think about the relative openness of epigenetic mechanisms is through temporality. Genetic variation is, like epigenetics, a product of interactions between genes and the environment (Hellenthal et al. 2014). However, while genetic changes occur in a random way (mutations) and over the slow timescale (or “deep time”) of evolutionary adaptation, epigenetic changes occur in the “real” time of lived experience and memory and are directly triggered by environmental inputs. The epigenome appears as a much more fine-grained “biosocial archive” (Relton, Hartwig, and Davey Smith 2015) where microevents occurring throughout the life course (exposure to toxins, diet, stress) leave stable molecular imprints that can today be detected via epigenetic biomarkers. The “postgenome”—a concept of the genome that includes epigenetics—is thus thought to be “far more fluid and responsive to the environment than previously supposed” (Jablonka and Lamb 1995, 26). It is rewritten as an “an exquisitely sensitive reaction mechanism” (Keller 2015, 10) that can change (at the level of expression) within the parameters of the human life span (Lappé and Landecker 2015). In this more permeable and “plastic” view of biological life, the environment is not something that simply happens outside bodies as an exposure but works in and through highly relational entities and telescopes differing time and spaces in a nonlinear fashion. Within an epigenetic temporality, pasts and futures can coalesce in the present.

Indigenous and non-Indigenous researchers we interviewed recognized the porousness of bodies and environments and the enfolding of past, present, and future epigenetic temporalities as congruent with Indigenous perspectives on “Country” and well-being. They noted that the Indigenous concept of Country is not synonymous with “the environment” but better understood as a vital force and an interconnected web of social, ecological, and spiritual relationships. Country epitomizes the way of existing in and viewing the world that might be termed the “relational ontology” of Indigenous Australians (McCoy, Tuck, and McKenzie 2016; see also Arabena 2015). As with all cultural understandings of health, Indigenous understandings of health are presented as diverse and complex (see Gee et al. 2014). Key elements, however, are interconnectedness and relationality between a range of human and nonhuman entities and places. Well-being is maintained through relationships of mutual care of kin and a range of nonhuman and country affiliations and obligations that are described by Law or Dreaming and encoded within the landscape (D. Rose 1992, 1996; Reid 1982). Individuals identify places and ancestors as parts of themselves, “in which people and land are almost inseparable” (Myers 1986, 25).

This entanglement of person, bodies, and environments was clearly evident in interviewee perspectives on the potential affinities between Indigenous health and epigenetics. One non-Indigenous developmental researcher suggested that the Indigenous health workers she worked with might not necessarily hold a “scientific knowledge of epigenetics,” but they positioned the environment (rather than the individual) as central to health and well-being:

If we look after the environment the environment looks after us . . . Indigenous cultures and people are so intimately connected to the land and environment and other people and relationships, and every one of those things can create an epigenetic change . . . if you’re well connected to land and well connected to ancestors and traditions, [then] you will have a long and healthy life. So that to me, kind of speaks to the really unconscious understanding of epigenetics.

Another Indigenous life scientist recounted: “we certainly understand what it means to be connected . . . across time, to place, to person, to family, to understanding, to history and the environment in which we live.” This interconnectedness was cited by three interviewees as key to both epigenetic processes and Indigenous ontologies, so much so that core concepts of DOHaD and epigenetics were said to be “very interwoven into [Indigenous]

cultural knowledge.”<sup>5</sup> Here, as Montoya (2011) reminds us in his ethnography of genetics and type 2 diabetes in Mexico, epigenetic knowledge gains “plausability, not through any inherent power of science, but by reinforcing already-existing cultural and political forms” (Wailoo et al. 2012, 14; see also TallBear 2013).

## Trauma, Epigenetics, and Biopolitics

In May 2017, on the twenty-year anniversary of the landmark *Bringing them Home* report on the Stolen Generations,<sup>6</sup> Indigenous Australians handed the prime minister a report seeking a national reparation program for all Aboriginal children forcibly taken from their families prior to 1970. In commenting on this report, CEO of the national Aboriginal and Torres Strait Islander Healing Foundation, Richard Weston (2017), drew on everyday understandings of historical trauma and its relationship to epigenetics, when he stated:

Trauma affects the way we think, act and behave. It is overwhelming and changes the way our brain and body works. For Aboriginal people that were taken from their families it has caused incredible suffering for individuals and communities in many different ways over many generations.

While Weston didn’t specifically mention epigenetics as a mechanism of transgenerational transmission of trauma, other Indigenous scholars have made these links. Indigenous social work academic Gilbert (2017), for example, researches the impacts of trauma on the Stolen Generations and has been inspired by Skinner’s (2015) popular work on “ancestral ghosts.” She suggests that “up to seven generations can be impacted upon by what’s happened to the generations before. This has been explored through research through the Jewish populations where people are still experiencing trauma from generations earlier” (Gilbert 2017). While there is uncertainty about the molecular pathways and processes that may be influenced by *inherited* epigenetic changes, Gilbert draws upon historical trauma and epigenetics to underpin and rationalize her own culturally situated understanding of the collective and intergenerational embodiment of the impacts of forced removal and racism.

Australian governments are beginning to respond to Indigenous concerns with schemes to provide financial compensation (e.g., for stolen wages) and to fund activities that support healing, although these responses are both belated and highly inadequate. In 2007, the Tasmanian government set up a

\$AUS 5 million Stolen Generation Fund, and in 2017, the South Australian government set up a similar scheme. The New South Wales government offers financial compensation to survivors of the Stolen Generations under a multimillion-dollar policy acknowledging the harm inflicted on Aboriginal communities by the forcible removal of children. The scheme included a \$AUS 5 million “healing fund” to address “the impacts of trauma not only for survivors but also for their families, descendants and communities” (New South Wales Government 2016). The Healing Foundation, an Indigenous mental health organization set up in response to a landmark report about the Stolen Generations (HREOC 1997), believes that around 17,000 Indigenous Australians today are direct victims of the Stolen Generations, but over one-third of the Indigenous population—over 114,000 people—are direct descendants of those victims. The work of the Healing Foundation is aimed at stopping the “cycle of trauma,” so that these descendants, and their future descendants, can avoid inheriting the trauma of their ancestors (Healing Foundation, n.d.).

How will the cycle of intergenerational trauma be stopped? One answer was given at a health conference in 2015 by Associate Professor Mark Wenitong, another leading Indigenous medical doctor and health researcher. In many presentations (e.g., “Aboriginal and Torres Strait Islander Health—the Narrative—Epigenetics to Agency”), Wenitong draws on histone modification and methylation to explain poor Indigenous health.<sup>7</sup> “These things are heritable, they are not genetic changes, but they are heritable across generations. So it means if we want to stop some of these changes happening we need to start now.” In a presentation in which the concept of hope was central, he called for maternal and child health programs based on epigenetic evidence, alongside empowerment, cultural continuity, and economic participation (Wenitong 2015).

Given the popularity of epigenetic discourse among leading Indigenous scholars and researchers, it seems inevitable that epigenetic-based health programs will emerge, although it is not yet clear what form they will take. It is therefore a critical time to consider the models of biopolitics of race, biosocial identities, and biological citizenship that may flow from epigenetic thinking. Such models would not constitute a return to a “geneticized conceptualization of race” (e.g., a notion of “race as a fixed genetic characteristic,” Morning 2011, 2014; Frank 2015), but a biopolitics that draws on plasticity—specifically environmental determination of genomic expression—highlighted by the particular version of epigenetics we have addressed here. This emerging landscape problematizes any attempt to neatly parse the social and the biological, as social constructionist critiques

of race have thought possible (Morning 2011). By illuminating new molecular pathways through which social experience permeates gene expression, epigenetics returns us to views of biology as porous and “impressionable” matter.

The social impressionability of biological matter is, however, no less fraught with dangers of biopolitical intervention than any view of a fixed and unchangeable biology (Meloni 2016, 2019). The recognition of being “plastically” shaped by an external environment or lifestyle does not diminish but goes hand in hand and possibly even intensifies the need to intervene in time, in the specific window of opportunity where human biology is receptive to social intervention. Further, an epigenetic biopolitics may lead to a condemnation of one’s condition if the accumulated effects of historical burden have made their cause irredeemable. Although the responsiveness of the epigenetic body to the environment is appealing to some Indigenous people, bodies that are deeply permeable to outside forces are no less vulnerable to forms of vigilance and disciplinary practices than bodies that are seen as stable and permanent (Meloni 2019; N. Rose 1998, 170).

These dangers were recognized by all of the interviewees. One informant suggested that if there is no attention to the “malleability” of epigenetics, then the science can be presented as “very deterministic—there’s always a risk that people start to adopt eugenic approaches . . . and it will weaken social policy rather than strengthen it.” Another interviewee noted the “slippery slope” between epigenetic-inspired pre- and postnatal health care and eugenics, suggesting:

There will be people saying they would like to understand epigenetics to see if we can treat a disease better, but there will be people who say “We’d like to think about epigenetic screening prenatally to weed out all those who are unfit.” It’s a very small voice at the moment . . . but I know quite a senior person who does have certain views about the worth of some people . . .

This argument echoes the long and often forgotten history of “nurturist eugenics” (Meloni 2016, 101-107.), an eugenics that posited the primacy of environmental factors in shaping the acquired biology of “vulnerable” or “risky” social groups. Often led by doctors and social activists rather than biologists, this strand of the eugenic movement sought to challenge the supposed fatalism and lack of humanity of mainstream eugenicists by stressing the effects of nurture on human heredity. However, the well-intentioned claims of empowerment of specific populations were used by others to argue for the acquired inferiority of these same groups. For



example, calls to address the “racial poison” (Saleeby 1914) of alcohol that aimed to improve environmental conditions for every child became a platform for others to call for restricted citizenship for members of “degenerated” stocks and their offspring (Meloni 2016, 106).

Such contradictory logics of empowerment *and* intensified governance highlight the inherent dangers of engaging strategic biological essentialism. To use suffering bodies to legitimate human rights, as Fassin (2000, 2009) reminds us in his concept of biogitimacy, is a political tactic that can provide certain types of leverage. In the case of Indigenous epigenetics, this tactic leverages a biopolitics of hope and is gaining visibility for new ways to address Indigenous ill-health, healing, and reparation. But through this strategic biological essentialism, the environment may become essentialized, enfolded into a powerful language of damage that justifies heightened biopolitical governance.

## Conclusion

In this paper, we have examined why some Indigenous researchers and policy makers in Australia and other postcolonial contexts are linking narratives of historical trauma, DOHaD, and environmental epigenetics to frame the negative intergenerational consequences of past injustices and make claims for stronger investments in health and health care, particularly in early life.

While the evidence for transgenerational transmission of trauma remains uncertain,<sup>8</sup> the political economy of hope has forged ahead, offering new pathways for redemption. For Rose and Novas (2005), hope is aspirational, promising political and economic benefits. However, hope is also an ambiguous space. As we have argued, these types of claims for reparations may become the source of a new political hope but also the platform to remake essentialist distinctions and single out special human groups based on their unique exposure to a history of social hardship that is enfolded into the body and transmitted as biological difference (Meloni 2017). In other words, even though the appeal of epigenetics is an apparent corrective to biological determinism and essentialism, Indigenous epigenetics may simply produce a new form of biological essentialism that is environmentally and historically determined but no less essentialist.

Indigenous Australians’ embracing of environmental epigenetics can be counterproductive, for in engaging in strategic biological essentialism, power relations may be concealed. Epigenetics may offer new strategies to lobby for protection from biosocial injury but also has the capacity to

conceal forms of governance that may follow from the identification of biological damage. In her work on Aboriginal children, epigenetics, and politics in British Columbia, Murray (2018) sounds a warning to such colonialist dynamics. She argues that an epigenetically grounded Early Development Instrument is based on the eugenic-based classification of “vulnerable Aboriginal children” (Murray 2018, 225), furthering State justification for biopolitical intervention in Indigenous lives (such as forced relinquishment of children).

In the context of Indigenous health in Australia, there will be multiple political possibilities and moral claims about the use, value, and interpretation of environmental epigenetics. While the discourse of epigenetics inspires optimism for many Indigenous Australians through a rhetoric of freedom that corresponds to their own ontologies and life experiences, supported by the authority of expert medical discourses, in practice, it has the potential to swing from one form of determinism to another. People may no longer be “determined” by “their genes” but by their milieu, history, and social and physical location (molecularly incorporated into the body), thus fostering emerging forms of environmental determinism and “environmental biopower” (Lorimer 2017). These complex power dynamics need to be acknowledged in the Indigenous engagement with epigenetics and the biopolitical strategies in which it is discursively wielded.

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## **Notes**

1. There are many different interpretations and subfields of epigenetics (see also Stotz and Griffiths 2016; Pinel, Prainsack, and McKeivitt 2017). In this paper, we focus on environmental epigenetics; how environmental exposures might have a role in altering gene expression that can lead to disease phenotypes that can be transmitted across generations.
2. On the use of genetics for “humanitarian” purposes, see Nelson (2012, 20-31).
3. Ethics approval for this project was granted from the University of Adelaide Human Research Ethics Committee (H-2016-045).
4. The Lowitja Institute is Australia's National Institute for Aboriginal and Torres Strait Islander Health Research, named in honor of their patron, Indigenous nurse, leader, and Elder Dr. Lowitja O'Donoghue.
5. Another approach to this argument could focus on Indigenous conceptions of personhood that are inextricably social, with autonomy distributed through networks of “individuals” rather than experienced individually (see Strathern [1988], Lamoreaux [2016], and Macdonald and Boulton [2016] for how this is expressed in parenting practices and conception beliefs).
6. The Stolen Generations are the Aboriginal and Torres Strait Islander children who were forcibly removed from their families under successive federal government policies and religious institutions between 1910 and 1970.
7. The version of this presentation with the above title was downloaded by Kowal from the Internet on August 31, 2016 (URL not available, file available on request). It is a ppt prepared by Mark Wenitong for the Future Health Leaders National Conference 2015. The talk is recorded on YouTube with the amended title “Where are we at with Indigenous health in Australia?” <https://www.youtube.com/watch?v=nj96IYE-6FE>
8. Scientific uncertainty has never been an obstacle to forms of translation of science into policy as the case of eugenics well represents (Bashford and Levine 2010; Turda 2010; Meloni 2016). Scientific “truths” do not have to be settled for power to have effect and emerging debates on translation of epigenetics support this case. The difference, however, in the translation of epigenetics, is that discourses of stabilization are coming from the group whom historically have

rejected the biologicalization of Indigenous lives and knowledge. We thank the journal editor for highlighting the significance of this problem.

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**Emma Kowal** is a professor of anthropology at the Alfred Deakin Institute and Convener of the Science and Society Network at Deakin University. She is a cultural anthropologist who previously worked as a medical doctor and public health researcher in Indigenous health. She is the author of *Trapped in the Gap: Doing Good in Indigenous Australia*.

**Maurizio Meloni** is a social theorist and a science and technology studies scholar. He is the author of *Political Biology: Science and Social Values in Human Heredity from Eugenics to Epigenetics* (Palgrave 2016), *Impressionable Biologies: From the Archaeology of Plasticity to the Sociology of Epigenetics* (Routledge, 2019), coeditor of *Biosocial Matters* (Wiley 2016), and chief editor of the *Palgrave Handbook of Biology and Society* (2018). He is currently ARC Future Fellow in the Alfred Deakin Institute for Citizenship and Globalisation, Deakin University, Australia.

## Brain changes: Simple Body Movement Activities in workplace.

*Rhythmic movement fosters organization and brings the person into attunement or better interpersonal contact with others. Interactive rhythm regulates nervous systems whilst movement activates the cerebellum and hence the limbic system through neuronal connections.*

### Standing

**Standing up can change alertness- this could be whole of office, individually or as a Mexican wave around the workplace**

Stand on one foot and then other -whirl arms like a windmill  
Stand and bend and touch knees, toes  
Do standing pushups on your desk

### Rocking

**Rocking can be soothing and calms the nervous system**

Swing arms backwards and forwards  
Do Floss dance  
Rock backwards and forwards from toes to heels

### Contact comfort- consider safety with these activities:

**Contact comfort, if done correctly, calms and soothes arousal**

Eye contact  
Use stretch bands/rubber tubing for push/pull activity  
Attention to the other person's body comfort is essential. As the individual's body is made comfortable, so does he or she feel welcome. It is important to attend to physical comfort, to see to it that the other person has a kind of supportive spatial arrangement and a sense of anchorage



### Grounding

**Grounding- helps with regulation and vertical integration of brain**

Lie on floor  
Take shoes and socks off and place your weight on floor (sitting or standing)  
Heavy beanbags/Rock cushions  
Lifting Weights  
Rolling large exercise ball across body

### Rhythm

Bouncing to a beat  
Bounce-and-clap  
Body drumming  
Desk top drumming

### Dancing

**Dancing and music-** engages poly-vagal social engagement

Dance Monkey <https://www.youtube.com/watch?v=FiXCxfWWwPo>  
Cha Cha Slide <https://www.youtube.com/watch?v=l1gMUbEAUFw>  
Stay <https://www.youtube.com/watch?v=iLzXCdtQHaQ>

Move it Mob Style Episode 3 <https://youtu.be/uj7goZVSWY8>  
Take a current hit and create your own dance moves in office

## Jumping

**Jumping can alter arousal and calm the person**

Star jumps

Kangaroo jumps

Frog jumps

Hopping from one foot to the other

Running on the spot



***Strong Proprioceptive input such as pulling and pushing or jumping or bouncing can bring the arousal system into an optimal state of alertness.***

## Sensory integration

Create opportunities across the day for sensory based activities to promote regulation of arousal level, attention, and emotion

Sharing: verbally contacting with others

Mindfulness: a state of conscious attending to the present moment as it unfolds

Curiosity: an attitude of open mind

Collaboration: getting other's collaboration in any process

Understanding your Fight/Flight/Active Freeze or Submit/Disassociated response- your natural truncated range of immediate orienting and defence responses available to you when a threat is perceived.

What are your survival behaviours you bring to the workplace?

How and what are you going to replace this behaviour with as this may be a long-term survival response? (You cannot just remove the response)

Skills for sequencing arousal in the body because of trauma

*Interoception is the perception of sensations from inside the body and includes the perception of physical sensations related to internal organ function such as heart beat, respiration, satiety, as well as the autonomic nervous system activity related to emotions.*

Building emotional literacy-naming emotions, explore emotions -What are you really feeling? How are you feeling?

Collaborate in activity choice

Support the intrinsic motivation to play

Tailor the activity to the "just right" challenge

Ensure activities are successful

## Emotional regulation

Regulating other's changes using co-regulation.

**Understand first.**

Where is the person and me in our individual Window of Tolerance?

What are the indicators for me and what are the other person's indicators?  
How do I use this information to adjust my contact to be regulating for this person? What have I seen and tried previously for them?

### Tools for creating co-regulation:

Matching Vitality Affect -understand your own ability for tolerance and ability to modulate your own regulation/behaviour use the relationship, create a playful fun atmosphere

Create physical and psychological safety

Match tone

Match intensity

Match prosody -Don't match the emotion

Cognitive skills

Communication and social skills

**Initial reactions to trauma can include** exhaustion, confusion, sadness, anxiety, agitation, numbness, dissociation, confusion, physical arousal, and blunted affect. **Most responses are normal in that they affect most survivors and are socially acceptable, psychologically effective, and self-limited.**

### Daily Activities-

These activities stimulate the neurological systems for knowing where one is in space and they support physiological capacity to orient to surroundings, essential to evaluating safety/regulation. Vestibular strengthening activities can be grounding and regulating

### Sensory-perceptual skills

#### Motor and praxis skills

LEGO You may think of LEGO as a toy for younger kids. But there are advanced kits with thousands of pieces that may interest adults.

Playing a musical instrument: Playing an instrument can help build fine motor skills, especially piano, woodwind instruments and guitar. Even if young person had trouble playing an instrument when they were younger, it's worth trying again if they express an interest.

Juggling: Learning to juggle may not be easy, but it's a fun way to improve both fine motor skills and hand-eye coordination. It's also a good activity for kids who tend to fidget. Have a range of juggling balls, bat, batons, bubbles.

#### Balance exercises

Balance boards, steppingstones, following lines on the floor and balance exercises.

Tightrope walks

This simple exercise improves balance, posture, and core strength.

1. Lift your arms and extend them out to the sides.



2. Walk in a straight line while focusing your gaze on a fixed point in the distance. (Use a piece of tape on the floor)
3. Each time you raise your foot, pause with your foot in this raised position for 2 to 3 seconds.
4. Take 20 to 30 steps.

#### Flamingo stand

1. Shift your weight onto your right foot.
2. Lift your left foot and extend your leg forward.
3. Hold this position for 10 to 15 seconds.
4. Increase the difficulty by reaching your hands toward your extended foot.
5. Return to the starting position and shake out your legs.
6. Repeat 3 times.
7. Then do the opposite side.

#### Back leg raises

This exercise strengthens your low back and glutes, which helps support good posture.

1. Place your hands on a wall or the back of a chair.
2. Shift your weight onto your right foot.
3. Slowly lift your left leg back and up as high as you can.
4. Hold this position for 5 seconds.
5. Return to the starting position.
6. Do 10 repetitions.
7. Then do the opposite side.

#### Tree poses

During this exercise, avoid placing your foot on your knee.

1. From standing, shift your weight onto your right foot.
2. Position your left foot to the side with your heel lifted or place the sole of your foot against your ankle, shin, or thigh.
3. Place your hands in any comfortable position.
4. Hold for up to 1 minute.
5. Then do the opposite side.

#### Heel-to-toe walk

This exercise strengthens your legs and improves balance.

1. Stand with your heels pressing into a wall.
2. Place your left foot in front of your right foot.
3. Touch your left heel to your right toes.
4. Then place your right foot in front of your right foot.
5. Touch your right heel to your left toes.
6. Continue for 20 steps.