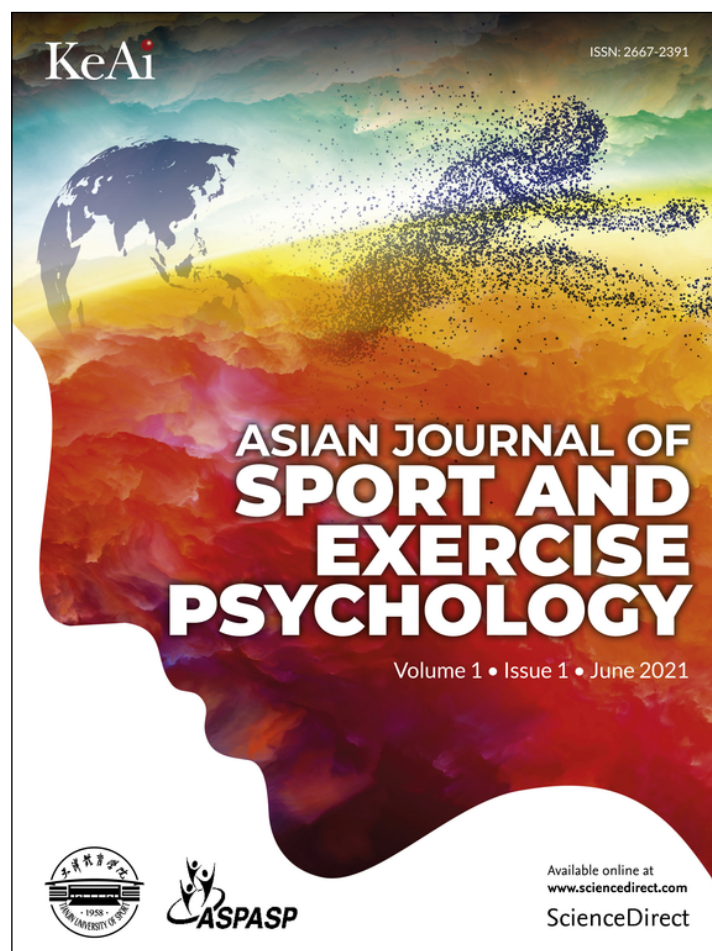




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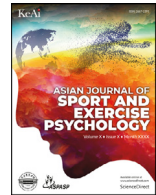
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Physical activity research in Australia: A view from exercise psychology and behavioural medicine

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ABSTRACT

Australia has a proud history in physical activity and is known for its love of, and success in, sport. It is also sometimes perceived to be a physically active country yet statistics show similar troubling trends of inactivity and non-communicable disease as many other high income countries. In research and professional practice, however, Australia can be seen to have been 'punching above its weight' (given its small population) in physical activity and public health. It has been a leading country for research on a number of themes concerning physically active lifestyles, including mental health, physical activity correlates, interventions, sedentary behaviour, and guidelines. The role of exercise psychology, however, is less clearly demarcated. The research concerning physical activity and public health has adopted a behavioural medicine approach, of which psychology is just one part. In this paper, behavioural medicine and exercise psychology will be defined, and research strengths and trends in Australia outlined. Issues particularly important for Australia will be explored briefly in the context of exercise psychology, including indigenous health and those living in rural and remote locations.

Introduction

Australia has a proud history in physical activity and is known for its love of, and success in, sport. It is also sometimes perceived to be a physically active country yet statistics show similar troubling trends of inactivity and non-communicable disease as many other high income countries. When I moved to Australia from the UK in 2014, I was amused by a friend of mine being surprised that Australia would need an Englishman "telling the Aussies how to be active". He believed the stereotype that all Australians were outside being physically active (cycling, beach or bush walking, surfing etc.), and that the English were a nation of sloths. Sadly, the two countries have similar trends that show a clear need for greater levels of community involvement in physically active lifestyles.

In this paper, I will summarise key issues and trends concerning physical activity behaviours in the context of Australia and Australians. I am a relative newcomer to Australia, as stated above, but I have been associated with Australian research in some way or another for over two decades, and first held an honorary university appointment in Australia in 2006. Nevertheless, this paper should be seen as a personal reflection rather than a definitive statement of content.

Australia has made a significant contribution to the study and practice of 'exercise' and 'physical activity' in a health-related context. De-

spite its relatively small population of ~25 million, it appears to have 'punched above its weight'. For example, it has produced comprehensive national physical activity guidelines, has enacted a number of prominent physical activity campaigns, and has been a world leader in the study of sedentary behaviour. Moreover, it has supported the production and analysis of several important large data sets that have included physical activity, and have leading behavioural researchers in physical activity (e.g., Kylie Ball, Adrian Bauman, Wendy Brown, Melody Ding, Billie Giles-Corti, David Lubans, Simon Rosenbaum), sedentary behaviour (e.g., David Dunstan, Paul Gardiner, Genevieve Healy, Tim Olds, Neville Owen, Jo Salmon), as well as strong researchers moving to Australia to work at different phases of their careers (e.g., Fiona Bull, Martin Hagger, Chris Lonsdale, Nikos Ntoumanis, Ron Plotnikoff, Amanda Rebar, Corneel Vandelanotte). Interestingly, the use of the term 'exercise psychology' is less prominent in this landscape. Australians have tended to adopt a wider view of the study of physical activity for health by being embedded more in behavioural medicine and behavioural epidemiology approaches.

In this paper, I examine some of the research foci and trends in recent years in the study of physical activity for health in Australia. While exercise psychology will be my framework, I will widen the discussion beyond psychology per se. Ultimately, improving levels of physical activity for Australians will require more than just psychology.

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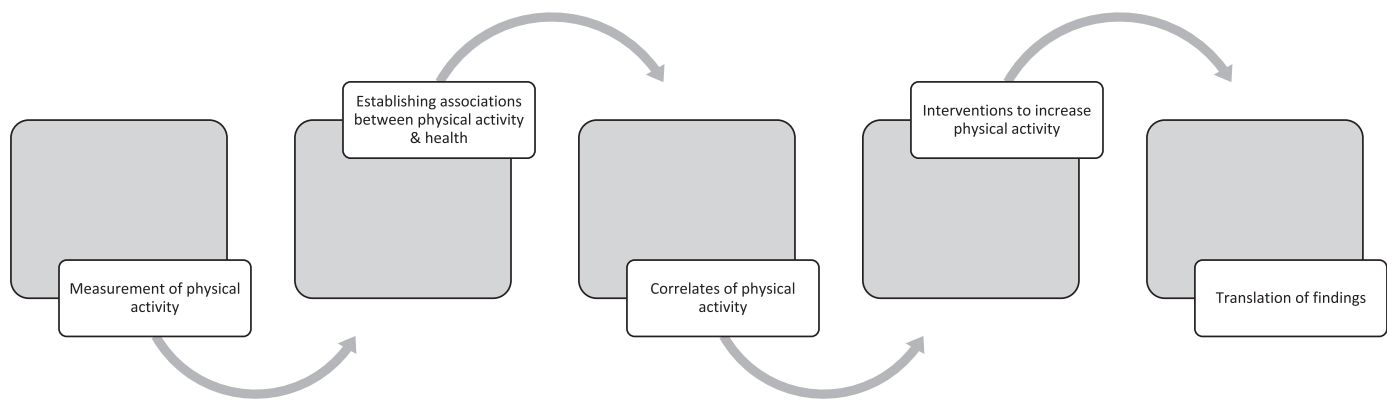


Fig. 1. The five phases of the behavioural epidemiology framework.

Delimiting exercise psychology and behavioural medicine

It was not until the 1980s that the term ‘exercise psychology’ was widely used in the international literature. It is defined as “representing a convergence of exercise science and psychology . . . [and] is concerned with (1) the application of psychological principles to the promotion and maintenance of leisure physical activity (exercise), and (2) the psychological and emotional consequences of leisure physical activity” (Lox, Martin Ginis, & Petruzzello, 2006, p. 5). Rejeski and Brawley (1988) applied Matarazzo’s (1980) definition of health psychology to exercise: “the application of educational, scientific, and professional contributions of psychology to the promotion, explanation, maintenance, and enhancement of behaviours related to physical work capacity” (p. 239). Today, the phrase ‘physical work capacity’ might better be changed to ‘physical activity’ or even ‘physical activity for health’. The important thing is that we are trying to create a conceptual distance between psychologies relevant for the understanding of competitive behaviours (*sport psychology*) from that of physical activity for health (*exercise psychology*). Exercise psychology at its simplest can be defined as the study of a) the psychological correlates or determinants of physical activity, b) psychological factors and strategies influencing physical activity behaviour change, and c) the psychological outcomes of involvement or non-involvement in physical activity (Biddle & Vergeer, 2019).

Physical activity behaviour change requires knowledge of physical health outcomes, behavioural measurement issues, environmental influences, and social/cultural context. As such, the field of exercise psychology may be only one part of what is now known as ‘behavioural medicine’. This field includes “psychology, public health, geography, sociology, health economics, architecture, epidemiology, psychophysiology, sports medicine, and human movement sciences as well as clinical medicine” (Marteau, Dieppe, Foy, Kinmonth, & Schneiderman, 2006, p. 438).

A popular framework adopted in Australia is the behavioural epidemiology framework. This is shown in Fig. 1 and depicts the five main phases for the understanding and changing of physical activity behaviour. International research has initially focussed on the early stages – measurement, health outcomes, and correlates. But there has been a clear shift to place greater emphasis on interventions and translation in the past decade.

Prior to discussing research trends concerning physical activity and psychology in Australia, it is important to highlight the role two accredited professionals – the Accredited Exercise Physiologist (AEP) and the Sport and Exercise Psychologist. The former is accredited through Exercise and Sports Science Australia (ESSA) and the latter is with the Australian Psychological Society (APS) and Australian Psychology Accreditation Council (APAC).

The AEP, according to ESSA’s ‘Scope of Practice’ document (see <https://www.essa.org.au>) states:

- “AEPs are recognised allied health professionals displaying a diverse range of knowledge and skills, working autonomously across a variety of areas and target pathologies that are included in the Accredited Exercise Physiologist Professional Standards”.
- “AEPs specialise in clinical exercise interventions for a broad range of pathological populations. These persons may be at risk of developing, or have existing, medical conditions and injuries. The aims of AEP interventions are to prevent or manage acute, sub-acute or chronic disease or injury, and assist in restoring one’s optimal physical function, health or wellness”.
- “These interventions are exercise-based and include health and physical activity education, advice and support for lifestyle modification with a strong focus on achieving behavioural change”.

Moreover, AEPs “work in a range of private and public settings delivering clinical services to clients across the full range of in-patient (acute) and community (sub-acute) settings, and qualify for provider status under Medicare Australia, the Department of Veterans’ Affairs and most private health insurers and compensation schemes” (Lederman et al., 2016, p. 348). Alongside a range of physical conditions, including musculoskeletal, metabolic and cardiovascular, mental health is also seen as a core target pathology. With a remit that includes behaviour change (e.g., lifestyle coaching and counselling), it might be argued that ‘physiology’ is not the right term. However, it is now embedded and recognised in the Australian health care system and unlikely to change.

The pathway to registration as a psychologist in Australia, including sport and exercise psychology (through the postgraduate professional psychology qualification pathway), is with the APAC, as shown in Fig. 2. According to the APS, sport and exercise psychologists hold expertise in:

- performance enhancement and mental skill development
- anxiety and stress management
- concentration and mental preparation
- overtraining and burnout
- team building and leadership
- communication skills and conflict resolution
- health and wellness coaching
- weight management
- debriefing and program evaluation
- recovery and restoration
- injury rehabilitation
- psychological assessment
- video analysis of sporting emotions and performances
- career transitions and coping with grief and loss (for example, de-selection and retirement)
- balancing sport and study, employment and/or family life.

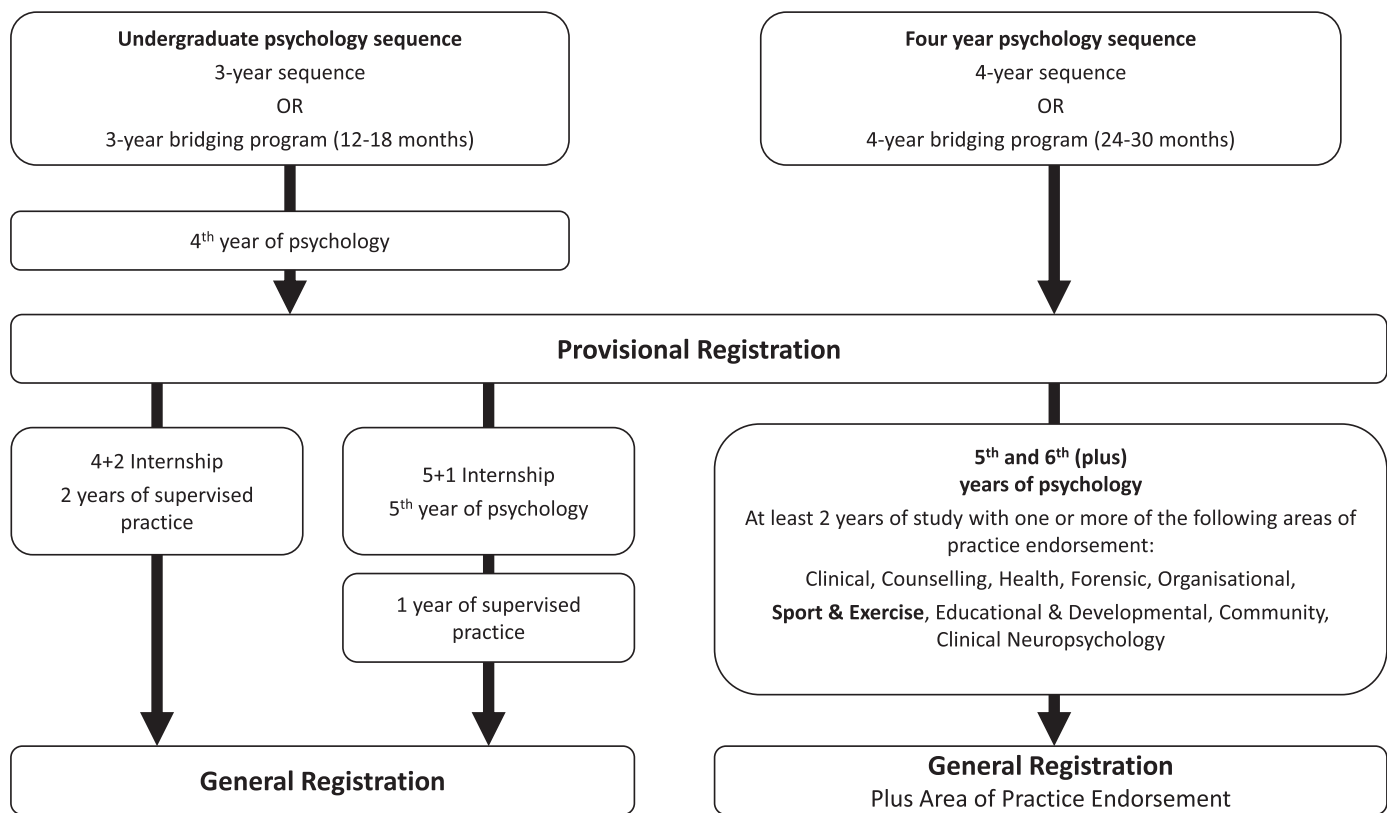


Fig. 2. Pathways to registration as a psychologist in Australia (see https://www.psychologycouncil.org.au/pathways_registration_psychologist).

Research trends in Australia

Physical activity and mental health

A key component of exercise psychology is mental health. This can be conceptualised as part of the second phase of the behavioural epidemiology framework where health outcomes of physical activity are identified.

The second National Survey of the Mental Health and Wellbeing of Australian Children and Adolescents, conducted 2013–2014, reported that a mental disorder was experienced by 14% of those aged 4–17 years, including major depressive and anxiety disorders (Lawrence et al., 2015). Other Australian data show 1.2 million mental health-related general practice (‘family doctor’) encounters annually for those in late adolescence and early adulthood (16–24 years), and this number increased by 21% during the 2000s (Australian Institute of Health and Welfare, 2011). The role of physical activity in the mental health of Australians is therefore important and is recognised by ESSA and other national agencies (Rosenbaum et al., 2018). “Increased access to dietary and exercise interventions in addition to evidence-based psychological and medical treatment for individuals experiencing mental illness” is endorsed by The Dietitians Association of Australia, ESSA, and APS (see https://www.essa.org.au/Public/Advocacy/Position_Statements.aspx).

A Delphi study and consensus statement by Lederman et al. (2016), on behalf of the Royal Australian and New Zealand College of Psychiatrists, stated how AEPs can contribute to a multidisciplinary mental health team. Examples were given of AEP-led interventions, including individualised lifestyle counselling and exercise programming, facilitating exercise programs, delivering education, conducting exercise assessments, using health coaching with individuals, working as part of a multidisciplinary team to promote physical activity, and provide training for mental health professionals concerning exercise in mental health set-

tings. However, the statement did say that AEPs are underutilised in mental health services.

In an ESSA commissioned review (Morgan, Parker, Alvarez-Jimenez, & Jorm, 2013), it was concluded that “there is a strong relationship between physical activity and mental health” (p. 69). Such a statement has been underpinned by an international literature in which Australia has played a key role. For example, in a meta-analytic review of reviews concerning moderate and high quality experimental evidence for depression and anxiety outcomes of physical activity in non-clinical populations, Rebar et al. (2015) reported a medium effect size (SMD = −0.50; 95% CI: −0.93 to −0.06) for physical activity and reduced depression. For anxiety, the effect was evident but more modest (SMD = −0.38; 95% CI: −0.66 to −0.11).

Rosenbaum et al. (2014) conducted a meta-analysis for physical activity and depression outcomes in those with mental illness. From 20 randomised controlled trials (RCTs), a large effect was found (SMD = 0.80). Rosenbaum et al. (2015) investigated whether the inclusion of physical activity as an adjunct to other mental health could be justified. They looked at depression, schizophrenia, anxiety disorders, post-traumatic stress disorder, and substance abuse. They concluded that physical activity is “a feasible, effective and acceptable adjunct to usual care for a variety of mental disorders” (p. 49). Moreover, they argued for greater investment in ways to increase physical activity for those with mental illness. Benefits to physical health outcomes were also highlighted as being important.

Australian-based researchers have also made a contribution to our understanding of whether physical activity is also associated with mental health in young people (Bailey, Hetrick, Rosenbaum, Purcell, & Parker, 2018; Biddle, Ciacconni, Thomas, & Vergeer, 2019; Lubans et al., 2016). For example, a meta-analysis of 16 trials by Bailey et al. (2018) concerning physical activity and depression symptoms revealed a large effect for physical activity in comparison to controls (SMD = −0.82, 95% CI = −1.02 to −0.61). A systematic re-

view of the underlying mechanisms for effects of physical activity on mental and cognitive health outcomes in youth was conducted by Lubans et al. (2016). They provided a conceptual model testing neurobiological, psychosocial, and behavioural mechanisms. They concluded that the strongest evidence was for psychosocial processes, including improvements in physical self-perceptions which accompanied enhanced self-esteem. But few studies addressed neurobiological and behavioural mechanisms.

Correlates of physical activity

A well-researched phase of the behavioural epidemiology framework concerns the determinants or correlates of physical activity. ‘Correlates’ are the factors that affect, or are thought to affect, participation in exercise and physical activity. They may involve individual, social, environmental, and policy factors, and will certainly not just be psychological in nature. ‘Determinants’ reflect factors that are thought to have ‘causal’ links to physical activity. Correlates has now become the standard term to use in the literature, mainly because it is recognised that many of the factors discussed are not, or may not be, true determinants (Bauman et al., 2012). In other words, data may show associations but causality cannot always be demonstrated or inferred (Biddle, Mutrie, Gorely, & Faulkner, 2021).

Early work on physical activity psychology and correlates was conducted by Lee and Owen (e.g., Lee, 1991; Lee & Owen, 1986; Owen & Lee, 1989). Alongside the seminal writings of Dishman, in the US (see Dishman, 1988), Lee and Owen were some of the first to systematically outline the links between exercise, psychology, and behaviour.

A number of systematic reviews of the literature concerning correlates of physical activity have been published. An influential early paper on adults emanated from Australia nearly 20 years ago (Trost, Owen, Bauman, Sallis, & Brown, 2002). This was updated and expanded by Bauman et al. (2012). Moreover, with the 2012 paper being published in *The Lancet* to celebrate the 2012 Olympic and Paralympic Games in London, it is likely to have been seen by a wider medical audience. These two papers are highly cited according to Scopus (at March 2021): Trost et al. with 1847 citations and Bauman et al. 1773 times. In the international review by Bauman et al., in addition to the usual categories of correlates (including psychosocial and behavioural), the paper also covered low-income and middle-income countries as well as genetic issues. They concluded that the next step in research was to “verify the causal role of consistent correlates ... to examine them in intervention trials and in generalizable samples” (p. 41).

Two key issues concerning correlates of physical activity for people in Australia concerns important ethnic/cultural and geographic factors. These concern indigenous and non-indigenous Australians, and the issue of rural and remote locations in a country of 25 million in some 7.7 million km². That said, 85% live in urban areas close to the coast.

According to the Australian Institute of Health and Welfare website (<https://www.aihw.gov.au/reports-data/population-groups/indigenous-australians/about>), 3.3% of the Australian population are indigenous (but varies by region), and often are referred to as ‘Aboriginal and Torres Strait Islander’ peoples. There is great diversity in culture and language between the many indigenous communities. Indigenous Australians tend to have poorer health than the non-indigenous population.

Gray et al. (2013) concluded that “the levels and impacts of physical inactivity are greater for indigenous people than they are for other Australians.” (p. 14). For example, in a recent review of barriers and facilitators of physical activity, including sport, for Aboriginal and Torres Strait Islander children and adolescents, May et al. (2020) reported only nine studies and a lack of good quality evidence. Many studies were cross-sectional, with small samples, and some states of the country were not represented. Motivations and barriers at the psychological level were similar to those reported by non-indigenous populations, including motivation, enjoyment, embarrassment, and perceptions of competence.

The authors concluded that the “barriers and facilitators of sport and physical activity ... indicate the importance of understanding the interactions between individual, community and cultural factors particularly in relation to the gender and geographic location of young Aboriginal and Torres Strait Islander Peoples” (p. 12). Similarly, in a review of qualitative studies investigating indigenous Australians’ perceptions of physical activity, four major themes emerged: family and community, culture and environment, sport, and gender differences (Dahlberg, Hamilton, Hamid, & Thompson, 2018). For example, women preferred family-focused activities and support for women’s sport. Moreover, sport was seen as influential in bringing communities together. Group, community, or family activities were desired forms of physical activity.

The geography and population demographics of Australia means that it can be common for studies of physical activity to feature samples from urban locations only. It is recognised that rural and remote communities have significant health challenges, including high prevalence of harmful health behaviours and mental health problems, alongside other challenges such as climate change and natural disasters, including bush fires (Roufeil, Gullifer, & Maybery, 2014). It is often thought that some additional barriers may exist for physical activity outside of large urban areas, including work, culture, transport, and facility availability.

A recent meta-analysis of 28 observational studies that investigated the levels of physical inactivity and sedentary behaviour in adults in rural Australia (Castrillon et al., 2020) showed that inactivity was higher in rural populations compared to those in urban areas. Sedentary behaviour was also greater. In a fact sheet from the National Rural Health Alliance (https://www.ruralhealth.org.au/sites/default/files/fact-sheets/Fact-Sheet-26-physical%20activity%20in%20rural%20australia_0.pdf), it is suggested that the diversity of rural communities means that single solutions are unlikely to succeed: “strategies and interventions need to take into consideration the local environment and circumstances, rather than using a one-size fits all approach.”

Olson and co-workers (Olson, Ireland, March, Biddle, & Hagger, 2020; Olson, March, Brownlow, Biddle, & Ireland, 2019; Olson, March, Clough, Biddle, & Ireland, 2019) studied the ‘peri-urban’ environment in Australia. This is more urbanised and densely populated than outer-regional and remote settings, but is outside of the major cities. From interviews, for example, factors identified as affecting physical activity were the natural environment, weather, distance, accessibility and walkability. Characteristics such as community spirit were identified as supportive of active lifestyles whereas a lack of public transport was a barrier (Olson, March, Brownlow, et al., 2019). In a survey of 271 Australians living in peri-urban areas, it was found that autonomous motivation was an important correlate of physical activity intentions and behavioural automaticity (Olson et al., 2020). This supports the view that social cognitive variables may need to be studied alongside variables from dual-process frameworks that account for more automatic forms of processing (Biddle et al., 2021; Brand & Cheval, 2019; Brand & Ekkekakis, 2018).

Australian researchers have made an important contribution to the study of the correlates of physical activity. However, more is needed on important contextual factors, such as different populations and environmental settings.

Psychological theory

Psychological theory plays an important role in exercise psychology, and more recently in the development and implementation of behaviour change through interventions (Michie et al., 2018). However, not all interventions are theory-based, nor do they explicate the theoretical mechanisms underpinning behaviour change (Plotnikoff, Morgan, Lubans, Rhodes, & Costigan, 2014).

In Australia, two theoretical approaches have received significant attention in recent years. The first approach is that of motivation, and especially Self-Determination Theory (SDT). Prominent authors include

the late Nikos Chazisaris, usually writing with Martin Hagger, as well as Chris Lonsdale, Nikos Ntoumanis, James Dimmock, and Ben Jackson. For example, SDT has been used as the theoretical basis for intervention work designed to increase physical activity in Australian school children (Lonsdale et al., 2019) and work has been conducted using SDT principles to analyse exercise-based messaging (Dimmock et al., 2020). Moreover, Ntoumanis has been a significant player in two recent large meta-analyses of SDT (Ntoumanis et al., 2020; Sheeran et al., 2020).

A leading researcher in the field of SDT has been Martin Hagger, with significant research output during his tenure in Australia (he currently works in the US). Hagger's contribution has been in theoretical integration, including work on the Theory of Planned Behaviour, SDT, as well as ego depletion and common sense illness perceptions (Hagger & Chatzisarantis, 2014; Hagger et al., 2016; Hagger, Wood, Stiff, & Chatzisarantis, 2010).

Another theoretical area of rising significance is that of 'habit'. Again, Hagger has been prominent (Hagger, 2019), as has Australian-based research by Rebar et al. (2016). This topic is likely to grow in the next decade as limitations of purely social-cognitive approaches are recognised.

Physical activity behaviour change

It was not common to see much said about social marketing approaches to the promotion of physical activity in the public health and exercise literature in the 1970s and 1980s. Social marketing is where principles and methods of marketing are applied to socially desirable goals, in this case physical activity. However, an important chapter by Australians Donovan and Owen (1994) brought such an approach into the international literature and widened approaches considered by exercise researchers.

Australia was at the forefront of mass media campaigns to promote physically active lifestyles. For example, the "Life. Be in It" campaign achieved national and international recognition and success from its inception in the last 1970s. Extensive TV coverage featured an overweight Australian male cartoon character 'Norm'. However, while fund raising and local initiatives still use this campaign, national funded ceased in 1981.

With the widespread use of social and other media, Australia has adapted the successful 'This Girl Can' initiative from the UK. The Australian state of Victoria has been running this initiative for 3 years and it has a strong psychological focus, including self-efficacy and affect. For example, the 3rd year report states that "the campaign evolved to focus on the importance of how activity makes women feel. Our research showed that when women shift from thinking about how they look when they exercise to how they feel when they move, it helps to moderate the fear of judgement and foster more enjoyable and sustained activity patterns" (see <https://mk0thisgirlcanfhvkpe.kinstacdn.com/wp-content/uploads/2020/11/TGC-Year-3-Report.pdf>).

The notion of 10,000 steps per day has become well-known. While there are debates about the number itself, it is an easy and well-recognised target to aspire to. A prominent initiative in Australia was the '10,000 Steps Rockhampton' campaign started in the early 2000s (Brown, Mummery, Eakin, & Schofield, 2006). The essentials of this community-wide intervention are summarised in Table 1.

Initial results suggested a high level of awareness of the initiative, and that uptake of pedometers and physical activity was more marked in women than men (Brown et al., 2006). But this initial campaign in a regional town in Queensland has now been adopted more widely through the state and funded by Queensland Health. The project website (see <https://www.10000steps.org.au/articles/about-us/>) states that "489,073 members have logged a grand total of more than 254 billion steps and continue to add an average of 43 million steps a day!" Professor Corneel Vandelanotte and his colleagues at Central Queensland University continue this valuable project, and include wider initiatives in workplaces as well as the community.

Other settings for physical activity promotion in Australia have included schools. For example, Lonsdale et al. (2019) focussed on increasing moderate-to-vigorous physical activity (MVPA) during school physical education lessons. The theoretical framework adopted was SDT: "we ... employed self-determination theory tenets to design an intervention that would ... help teachers learn strategies that would motivate students over the long term by increasing perceptions of autonomy, competence and belongingness" (p. 341). In a large trial with 1421 students from 14 schools, only modest success was reported for MVPA, with the authors suggesting further online teacher training might be beneficial.

In an interesting study reported by Lubans et al. (2020), 670 older adolescents in schools were recruited into the 'Burn 2 Learn' RCT. This tested the effectiveness of what was described as a 'time-efficient' method of teacher-facilitated high-intensity exercise breaks. Unsurprisingly, physical fitness improved for these students, but no effects were noted between the high-intensity group and controls for mental or cognitive outcomes.

Another innovative study in Australia has involved school aged children and their fathers (Morgan et al., 2019). However, a key focus was on the fathers, giving the intervention a novel angle. In one report from the 'Healthy Dads Healthy Kids' (HDHK) project, 189 fathers and 306 children showed positive changes in weight status after weekly practical and theoretical sessions, and with 12-month retention.

Finally, Vandelanotte et al. (2018) have led important work concerning e- & m-health. For example, one study tested whether a Web-based computer-tailored intervention could be enhanced by integrating Fitbit activity trackers. Eight online modules were delivered with 243 Australian adults taking part. Those with Fitbits increased their total physical activity and MVPA compared with those without.

In conclusion, Australian physical activity researchers have made significant contributions to intervention research, including work on social marketing and mass media, in schools, with parents, and using technology.

Sedentary behaviour

Sedentary behaviour has been defined as behaviours during waking hours that incur low energy expenditure involving sitting, lying or reclining (Tremblay et al., 2017). The area has developed rapidly over the past two decades, and much of the progress has been driven by Australian researchers, such as David Dunstan, Genevieve Healy, Neville Owen, and Jo Salmon. Using the behavioural epidemiology framework, Australians have made huge contributions to research concerning sedentary behaviour overall (Owen et al., 2020; Owen, Healy, Matthews, & Dunstan, 2010; Zhu & Owen, 2017), as well through research on measurement (Healy et al., 2008; Owen, 2012; Winkler et al., 2016), health outcomes (Dempsey et al., 2020; Dunstan et al., 2012; Owen et al., 2020), correlates (Owen et al., 2011; Salmon, Tremblay, Marshall, & Hume, 2011), interventions (Gardiner, Eakin, Healy, & Owen, 2011; Healy et al., 2017), and translation (Healy, Goode, et al., 2016), with some being very early in the development of this field (e.g., Salmon, Owen, Crawford, Bauman, & Sallis, 2003).

Initial research efforts focused on health outcomes of sedentary behaviour, including links to cardiometabolic health, use of large data sets to analyse patterns and health outcomes, including AusDiab (e.g., Dunstan et al., 2005) and the Australian Longitudinal Study of Women's Health (e.g., Tay, Moran, Harrison, Brown, & Joham, 2020), and use of measurement devices. While early work on correlates and interventions in sedentary behaviour were evident in Australia (e.g., Gardiner et al., 2011), few discussed psychological correlates of such behaviours (but see Salmon et al., 2003).

In recent years, much greater emphasis has been placed on behaviour change, with a strong focus on workplace (Healy, Eakin, et al., 2016) and school settings (Salmon, Arundell, et al., 2011). Typically, such approaches include individual, organisational, and environmental inter-

Table 1

Summary of intervention elements for the 10,000 steps Rockhampton community intervention (Brown et al., 2006).

Strategy	Description
Marketing	• Use of media, including print, radio and TV • Mail outs to organisations, newsletters, emails • Built a brand • Seek out in-kind support
Health professionals	• GP clinics provided with promotion materials (posters, brochures, pedometers) and brief training in physical activity counselling • Other health professionals encouraged to promote the initiative
Environmental supports	• Working with the city council to improve the local environment (e.g., creating or repairing key footpaths) • Also erecting '10,000 Steps' signs, and distributing maps to encourage walking • Promote dog walking • Creation of a Local Physical Activity Task Force to involve community members

vention strategies (see Salmon, Hesketh, Arundell, Downing, & Biddle, 2020). The latter might involve a change in office or classroom furniture through the use of sit-to-stand or elevated work surfaces. Alongside this, psychological approaches have been used and have included education, self-monitoring, and self-efficacy. This wider approach reflects how Australian researchers have undertaken studies in both physical activity and sedentary behaviour from a wider, multi-disciplinary approach, rather than just rely on individual psychology alone.

Organisations

The organisations of ESSA and APS were discussed earlier in the paper. ESSA is the lead-body for Accredited Exercise Physiologists, and APS for Sport and Exercise Psychologists. But other organisations in Australia are worthy of note to provide further academic and professional context.

In addition to ESSA, those interested in physical activity can be affiliated with Sports Medicine Australia (SMA). According to its website, SMA is the “peak national multi-disciplinary member organisation that provides leadership in the areas of sports exercise and medicine, sports injury, physical activity, sports exercise and science, and the healthy performance and participation of Australians in physical activity and sport” (<https://sma.org.au/about-sma/>). The SMA annual conference has a strong emphasis on physical activity for health, with exercise psychology topics featuring on a regular basis through submitted presentations and keynote lectures.

A new organisation was established in 2020 – the Australasian Society for Physical Activity (ASPA). This has a mission “to provide a forum for researchers, practitioners and policy makers to advocate, network, build capacity, and share expertise and experiences and hear about the latest research and practice in physical activity in Australasia”. It has the overall aim “to advance knowledge and integration of physical activity into health, education, urban planning and transport practice and policies across all levels of government and non-government organisations in the Australasian region in order to benefit the health and wellbeing of all communities across Australia, New Zealand and South East Asia” (see: <https://aspactivity.org/about/>). ASPA seems to have a strong focus on behaviour and implementation, thus psychology will play a key role in this multidisciplinary organisation.

Reflecting the broader field of behavioural medicine is the Australasian Society of Behavioural Health and Medicine (ASBHM). This is the equivalent of national and international societies of behavioural medicine (e.g., Society of Behavioral Medicine, UK Society for Behavioural Medicine, International Society of Behavioral Medicine). ASBHM “aims to serve the needs of all health-related disciplines concerned with the integration of behavioural and biomedical sciences” (<https://www.asbhm.com/about-asbhm/>).

Guidelines

Australia has been a leading country for the development of physical activity guidelines with early work stemming from the late 1990s (Egger, Donovan, Swinburn, Giles-Corti, & Bull, 1999). The latest version for adults, in 2014, states that physical activity should be 150–300 min per week of MVPA. The upper level was also suggested in the US in 2008 for ‘additional benefits’, and has now been widely adopted (Bull et al., 2020; Piercy et al., 2018). In addition, Australia has moved to the 24-h model of movement in their guidance for pre-school and school-aged children and adolescents. This is where physical activity recommendations are made alongside those for sedentary behaviour and sleep (Okely et al., 2017). Interestingly, Australian researchers and health professionals have questioned how feasible the current guidelines are for limiting young people’s use of screen-based media (Houghton et al., 2015).

Report cards

Australia – through ‘Active Healthy Kids Australia’ (see <https://www.activehealthykidsaustralia.com.au/about/>) is part of an international network producing national report cards for physical activity. Using national data, where available, grades are assigned to different behaviours and outcomes (overall physical activity levels; organised sport and physical activity participation; physical activity in schools; screen time; active transport; physical fitness; movement skills), as well as influencing factors (family and peers; school; community and built environment; strategies and investment). An ‘A’ grade is the highest and reflects a majority of children being active or meeting the criterion (>80%). Grades then decline through B, C, D, and F, while some could be graded as ‘INC’ to reflect lack or inappropriateness of data. Grades were also rated for ‘confidence’ in arriving at the assessment, ranging from ‘substantial’ or ‘minimal’ concerns about the data.

Returning to an earlier comment where many see the Australian stereotype of fit and active children (and adults) in sport, on beaches, or in communities, the report cards paint a much more pessimistic picture. The latest 2018 card grades are shown in Fig. 3, with five of the behavioural assessments rated a lowly ‘D’, and only one assessment achieving an ‘A’ grade (community and built environment). Overall physical activity levels were rated only ‘D(-)’, and this has not changed since the 2014 report card. This puts Australia in the bottom half of the other countries submitting report cards. Rather few grades changed from 2014 to 2018, suggesting that much more needs to be done to increase the facilitators and active behaviours of young Australians.

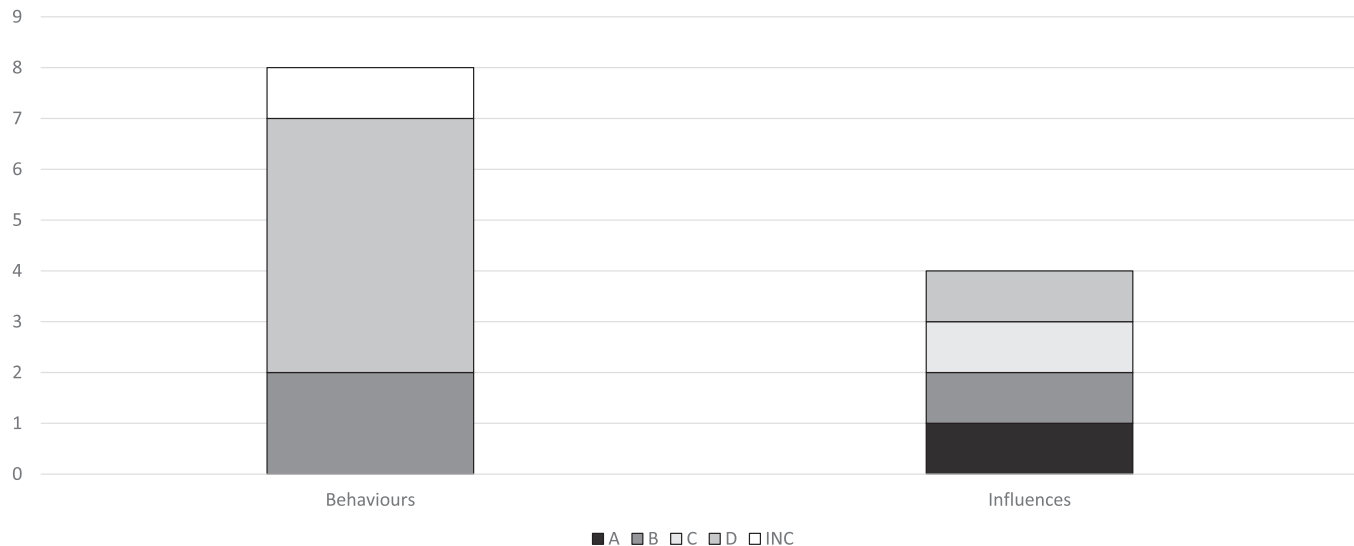


Fig. 3. Grades from the 2018 Australian physical activity report card for children and youth.

Conclusions

Australia has contributed greatly to the study of physical activity and exercise behaviours within a health-related context. I believe it has ‘punched above its weight’ for a nation with a small population and has had considerable international influence. However, the data suggest that Australia, like many high-income countries, has significant challenges in raising current low levels of physical activity and changing associated non-communicable diseases and indicators of well-being. While exercise psychology can contribute to this, Australia seems to have rather few specialists in this field, but rather has significant strength in behavioural epidemiology, behavioural medicine, and public health. If exercise psychology can be integrated into these broader fields, this will serve Australia well.

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