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## Moving adolescents for a lifetime of physical activity: shifting to interventions aligned with the third health revolution

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### ABSTRACT

Public health advocates have been calling for an intensified focus on early, middle, and late adolescence health behaviours due to both the short- and long-term health consequences. Hence, both the health-risk (e.g., alcohol consumption) and health-promoting (e.g., physical activity) behaviours of adolescents have been widely studied to better understand the underlying causes or determinants with an eye towards implementing more effective interventions. The success of these interventions, typically grounded in a risk-reduction/prevention-oriented intervention approach has been modest, especially those focused on health-promoting behaviours, such as physical activity. The purposes of this paper are to (1) conduct a conceptual critique of the risk-reduction/prevention-oriented approach underlying traditional adolescent physical activity interventions, and (2) examine the potential usefulness of an emerging person-based, development-oriented (PBDO) approach for enhancing the motivation and sustainability of adolescent physical activity. Within this PBDO perspective, emphasis is on adolescent growth and development as the starting point for initiating and sustaining physical activity. Implications of the PBDO approach for adolescent physical activity interventions are presented.

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Prevention; development; physical activity; adolescent; intervention; well-being

Adolescents have been a focal point of public health promotion as data from multiple sources suggest they are on a high-risk health behavioural trajectory for future chronic degenerative diseases and poor health outcomes (Mulye et al., 2009; Park, Scott, Adams, Brindis, & Irwin, 2014). Typically, these behaviours are categorised as health-risk (e.g., tobacco, alcohol, and illicit drug use) or health-promoting (e.g., physical activity and nutritious eating). Although there is certainly interdependence between and common causes of health-risk and health-promoting behaviours (Flay, 2002), the focus of this paper is on adolescent health-promoting behaviours with primary emphasis on physical activity, and, to a much lesser extent, dietary intake. These two health-promoting behaviours are often linked together. For example, sedentary adolescents have a lower consumption of fruits and vegetables than their physically active peers (Pearson & Biddle, 2011). The significant role of physical activity in adolescent health has sparked many interventions focused on decreasing sedentary behaviour and/or increasing movement. Thus, the primary purposes of this *conceptual review* are to (1) critique the philosophy and effectiveness of the traditional approach to adolescent physical activity interventions, and (2) based on that critique, discuss emerging ideas about adolescent development that show promise for enhancing the sustainable impact of future physical activity

interventions for this age group. At times in the paper, we use the broader terms ‘youth’ and ‘young people’ where appropriate, but the primary emphasis is on adolescents (ages 10–19).

Results from epidemiological research demonstrate strong relationships among regular physical activity, healthy eating, and the prevention of chronic diseases including heart disease, cancer, and stroke (Lichtenstein et al., 2006). Identified as an ‘epidemic’, obesity is a major risk factor for chronic disease and is associated with physical activity levels and food intake (Institute of Medicine, 2009). For adolescents aged 12–19 years, the prevalence of obesity has tripled since 1970, and for young people ages 6–19 nearly one in five are obese (Fryar, Carroll, & Ogden, 2014; Hales, Carroll, Fryar, & Ogden, 2017). This is significant because youth obesity tends to track into adulthood (Hayes, Dowd, MacDonncha, & Donnelly, 2019) and carries a heightened risk of immediate and future chronic diseases (e.g., cardiovascular disease, musculoskeletal disorders, type-2 diabetes, osteoarthritis, and several types of cancer) (Office of the Surgeon General, 2010; Panday, 2017). What is most concerning is that many of these health issues can develop earlier than adulthood in obese or overweight youth (Panday, 2017).

Much of the exponential increase in obesity rates can be attributed to physical inactivity among youth (Janssen et al., 2005), and, unfortunately, the greatest lifespan decline in physical activity occurs during adolescence. Adolescent physical activity decreases up to seven percent per year between the ages of 9–15 years (Brodersen, Steptoe, Boniface, & Wardle, 2007; Dumith, Gigante, Domingues, & Kohl, 2011). Sixty-two percent of children aged 9–13 years do not participate in any organised physical activity during non-school hours, and 22.6% do not engage in any free-time physical activity (Duke, Huhman, & Heitzler, 2003). Further, data from the National Health and Nutrition Examination Survey and National Youth Fitness Survey indicate that 75.2% of youth do not engage in moderate-to-vigorous physical activity for at least 60 minutes daily (Fakhouri et al., 2014). These physical activity rates continue to decrease as adolescents move into young or emerging adulthood (Strong, Parks, Anderson, Winett, & Davy, 2008). Similarly, adolescent fruit and vegetable intake is low. Results from the Youth Risk Behavior Survey (YRBS) indicate approximately nine percent and two percent of high school students meet daily fruit and vegetable recommendations, respectively (Moore, Thompson, & Demissie, 2017).

As such, according to Park et al. (2014), the quality of adolescent health ‘shows little to no progress on most key measures’ (p 12). Pertaining to the two health-promoting behaviours of interest in this paper, data indicate that millions of adolescents are not moving their bodies on a regular basis nor eating healthy foods at the recommended levels (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015). The situation is especially worrisome since these two behaviours are established in childhood (Anderssen, Wold, & Torsheim, 2005), track into adulthood (Hayes et al., 2019), and tend to cluster as a pattern (Jago et al., 2004).

### **Paper’s paradigmatic focus**

The health behaviour trends highlighted in the previous section suggest that focused interventions from multiple sources are needed to help adolescents become interested in and *sustain* physical activity across the lifespan (Perry, Garside, Morones, & Hayman, 2012). This paper takes a bigger picture view as to why many well-intentioned interventions to date have been relatively ineffective in enhancing adolescent physical activity. We propose that a conceptual shift in perspective could make adolescent-based interventions more effective in fostering sustainable physical activity. It is not our intent to conduct a systematic or comprehensive review of interventions designed to promote adolescent physical activity, as this has been done quite well by others (e.g., Biddle, O’Connell, & Braithwaite, 2011; Kriemler et al., 2011; Metcalf, Henley, & Wilkin, 2012). Rather, our primary focus is on the meta or paradigmatic foundations underlying physical activity interventions.

A paradigm is a broad system of beliefs and values that directs both science and practice (Overton, 2015). Paradigms are slow to shift and when they do, the new paradigm typically includes terms and concepts from the replaced paradigm but they are seen in new or novel ways (Kuhn, 1970). For

example, Copernicus was called mad because he deemed earth as moving (new paradigm) rather than fixed (traditional paradigm). Scientists and practitioners are guided by paradigms – ways of believing and thinking – and see and do things in certain ways as a result of these views. Paradigm shifts occur when the dominant paradigm reaches crisis or can no longer solve the problems for which it was created (Ekkekakis, 2017). Initially, there can be resistance to developing or emerging paradigms because sometimes the new concepts or way of viewing the world may not initially help ‘at all with the problems that evoked the crisis’ (Kuhn, 1970, p. 154).

### Existing paradigm: risk-reduction, prevention-oriented approach

We begin with the supposition that the majority of adolescent physical activity interventions have utilized a disease-risk reduction/prevention-oriented approach embedded within a biomedical paradigm. This is to be expected in that the biomedical paradigm has dominated medicine for centuries and recent public health-promotion practices have followed suit (Antonovsky, 1996; Ekkekakis, 2017; Kimiecik, 2011, 2016). Emerging from the Cartesian revolution, the biomedical way of thinking is mechanistic, based in instrumental reasoning, characterising organisms as inherently stable, fixed, rational, and predictable (Capra, 1982; Overton, 2015). Max Weber referred to instrumental reasoning as a pattern of thinking focused on world mastery via the precise calculation of adequate means (see Buchanan, 2000 for further explanation). Within the health context, the biomedical model became dominant in Western society and led to what Breslow (2004) termed the first health revolution in the middle of the nineteenth century to combat the spread of communicable diseases via vaccines and social change.

The second health revolution occurred in the middle of the twentieth century and involved a biomedical approach to reducing premature mortality due to chronic degenerative diseases, such as heart disease. Expensive technological intervention and expert-based healthy living guidelines were the primary means of intervention. The biomedical model served its purpose in leading these two revolutions by contributing to the eradication or reduction of both communicable and chronic degenerative diseases, at least in the Western world. Breslow argues that the current situation now calls for a third revolution – building health as a resource for everyday life – in which people desire something beyond being free of disease, such as having the capability to do what one wants to do in life and resisting forces that impede that inner imperative. Breslow suggests that this third health revolution could be transformative for individuals and society and has already commenced without many healthcare professionals recognising it as such.

### Limits of risk-reduction/prevention-oriented approach

Within the third revolution, approaches to health entrenched in the biomedical model have some severe limitations. In a Cartesian/biomedical worldview, behaviours such as physical activity are considered lifestyle-based risk factors for a variety of chronic degenerative diseases. Prevention via adherence is central to this disease-based model of health (i.e., get adolescents to adhere to regular physical activity to reduce their risk factors and prevent disease). Katzmarzyk (2010) has suggested that allegiance to this ‘existing paradigm’, with its focus on biomedically-based guidelines for physical activity, has created ‘pandemic paradigm paralysis’ with a rush to increase levels of physical activity and the ‘widespread inability to envision alternative or new models of thinking’ (p. 2717). He proposes a shift to a physical inactivity paradigm and novel ways to ‘reduce widespread exposure to sedentary behaviors’ (p. 2723). Although this could be a paradigm shift, we suggest that this perspective still falls within a biomedical paradigm of changing certain behaviours (sedentary) within a risk factor/disease prevention approach.

Capra (1982) and others (e.g., Antonovsky, 1996; Buchanan, 2000; Kimiecik, 2011; Kimiecik & Lawson, 1996) claim that the risk-reduction/prevention approach views the body as a machine. Disease, which is defined as a disruption in the body’s biological processes, is divorced from emotions

and spirit. Thus, *the* focus of the biomedical model is on fixing what is wrong with the body (treatment) and/or on identifying ways to circumvent disease development (prevention). As an example, within the field of developmental science this model spawned prevention science (Catalano, Hawkins, Berglund, Pollard, & Arthur, 2002), which focused largely on targeting risk factors and emphasising deficits in youth. According to Catalano and colleagues, most prevention science interventions limit their focus to individual-level change and one or two risk factors, ignoring relational or holistic patterns between individuals, groups, context, and behaviours. The same could be said for biomedically-driven physical activity interventions. Physical activity and diet have been identified as major modifiable disease agents along with environmental determinants (Bouchard, Blair, & Haskell, 2012). Hence, scientists and practitioners operating within this belief system have attempted to find ways to change people's (of all ages) physical activity behaviour to help them delay or avoid the onset of chronic-degenerative disease (King, Stokols, Talen, Brassington, & Killingsworth, 2002). Importantly, the initial focus is on the behaviour rather than the person. This starting point is a significant flaw as Ekkekakis (2017, p. 85) suggests that 'possibly more than any other health behaviour, physical activity is disconnected from the awareness of its health benefits'.

Interventions driven by the biomedical model tend to adopt prescriptive approaches to physical activity based on guidelines continually revised and updated by expert-based organisations, such as the CDC and American College of Sports Medicine (Ekkekakis, 2009, 2017). Although these guidelines for physical activity have changed over the years (see Pate, 2012), the primary focus is on how much is enough (i.e., frequency, intensity, duration) for reducing risk of disease (U.S. Department of Health and Human Services, 2018). This way of thinking has kept health and fitness promotion in the dominant mode of disease prevention (Antonovsky, 1996; Kimiecik, 2011; Segar & Richardson, 2014). Within this prevention science context (Kurtines et al., 2008), treating the adolescent as a rational object comprised of distinct lifestyle-based risk factors for disease needing to be changed lead to fragmented behavioural interventions designed to fix what's missing (Reyna & Farley, 2007). That is, this risk and protective factors approach (Schwartz, Pantin, Coatsworth, & Szapocznik, 2007) assumes that adolescents are missing some key social, physical, and cognitive skills and once they acquire these they will be less likely to smoke, use illicit drugs, binge drink alcohol, or partake in unsafe sex. Ekkekakis (2017; Ekkekakis & Zenko, 2016) has labelled this approach the *rational educational model* and suggests that the field of public health is in a paradigmatic crisis as a result of the model's failed application to exercise behaviour change. Generally, interventions grounded in these biomedical, prevention-oriented, rational educational models have demonstrated limited effectiveness in the short-term and further decreases in sustainable health behaviour change after six months to a year (Burt, 2002; Jackson, Geddes, Haw, & Frank, 2011; Reyna & Farley, 2007).

Similarly, multiple systematic reviews of child, adolescent, and youth physical activity interventions (e.g., Biddle, Petrolini, & Pearson, 2014; Kriemler et al., 2011; Marcus et al., 2006; Metcalf et al., 2012; Rhodes, Janssen, Bredin, Warburton, & Bauman, 2017; van Sluijs, McMinn, & Griffin, 2008) conclude that such interventions have had modest behavioural effects. Metcalf et al. (2012) note: 'strong evidence ... shows that physical activity interventions have little effect on the overall activity of children' (p. 6). For youth, Rhodes et al. (2017) summarise 'intervention effectiveness as inconclusive' (p. 959). Even in one of the reviews that concludes the studies were generally effective (Kriemler et al., 2011), the authors highlight a major problem: 'establishing the sustainability of these interventions and their effects as well as transferring these programmes into real-world settings' (p. 929). These reviewers, along with Biddle et al. (2011), observe that intervention effect sizes are small and little is known about sustaining long-term change. For instance, studies demonstrating increases in adolescent physical activity within the school day have not generalised to physical activity outside of the school setting (Haerens, De Bourdeaudhuij, Maes, Cardon, & Deforche, 2007; Love, Adams, & van Sluijs, 2019; Marcus et al., 2006; van Sluijs et al., 2008).

Adolescent physical activity interventions within a biomedical paradigm – disease prevention through the adoption of and adherence to physical activity – typically use various social-cognitive,

educational, or environmental adaptation strategies to change behaviour (Ekkekakis & Zenko, 2016). For example, school-based interventions have focused on such strategies as enhancing the quantity and quality of physical education via health education, physical activity breaks, providing more equipment (e.g., pedometers), after-school fitness and sport programmes, and computer-tailored feedback to enhance motivation (e.g., Sutherland et al., 2016). As indicated, the results of these studies in terms of sustainable behaviour change appear to be quite modest (Love et al., 2019). Certainly, conducting intervention research with youth is challenging (Sutherland et al., 2016), but from a paradigmatic perspective such risk-reduction/prevention-oriented approaches within a rational educational model to behaviour change may be limited within Breslow's notion of a third health revolution. Thus, the take away from these reviews of hundreds of child and adolescent physical activity interventions is that at the very least novel perspectives could be integrated into this work to align with the third revolution of health, reflecting adolescents' goals, desires, and ways of experiencing health as a resource for everyday living.

In sum, many of the physical activity interventions targeting adolescents are implemented within a biomedical paradigm. This is not too surprising in that it has been suggested that risk reduction and disease prevention models continue to dominate public health promotion and are more deeply entrenched in both research and practice than ever (Nettleton, 2006). As such, this biomedical world-view could be limiting intervention impact on the lives of adolescents due to misalignment with the third health revolution. Similar to medicine in which the patient-as-human-being has been neglected over many years (Ghane & Sweeny, 2013), the adolescent's *experience* of physical activity has been minimised. Table 1 summarises key elements of a risk-reduction, prevention-oriented approach in comparison to a person-based, development-oriented approach, which will be introduced and discussed in more depth in the next section. We are not suggesting that researchers conducting these very well-intentioned, high quality physical activity interventions consciously assume that adolescents have behavioural deficits (Starting Point) or need fixing (Primary Assumption). But embedded in a paradigm are values, beliefs, and cultural practices that shape and direct points of

**Table 1.** Comparison of adolescent physical activity intervention approaches.

	Risk-reduction, prevention-oriented	Person-based, development-oriented
Origins	<ul style="list-style-type: none"><li>• Cartesian philosophy</li><li>• Biomedical model</li></ul>	<ul style="list-style-type: none"><li>• Humanistic psychology</li><li>• Positive psychology</li><li>• Positive youth development</li><li>• Applied developmental science</li></ul>
Starting point	<ul style="list-style-type: none"><li>• Deficit-based</li><li>• What is wrong with you?</li><li>• Behaviour-focused</li></ul>	<ul style="list-style-type: none"><li>• Growth-based</li><li>• What is right about you?</li><li>• Person-focused</li></ul>
Primary assumption	Adolescents are rational objects and interventions are needed to fix personal troubles	Adolescents have an inherent agency to be directed towards positive well-being and health behaviours
Emphasis	Deterrence: Physical activity is a means for disease risk-reduction and prevention of unhealthy outcomes	Development: Experiencing core life goods leads to more sustainable healthy behaviours (e.g., physical activity)
Professional role	Expert with behaviour-specific knowledge	Collaborator with broad interest in positive well-being experiences
Change process	One-size-fits-all prescriptive programmes that seek to change thoughts, and feelings presumed to be connected to targeted behaviour	Provide autonomy-supportive environments to enhance self-discovery and self-expression experiences leading to identification of unique gifts and core passion
Limitations	<ul style="list-style-type: none"><li>• Too Simple</li><li>• Behaviour without meaning</li><li>• 'Can't see Forest for the Trees'</li></ul>	<ul style="list-style-type: none"><li>• Too complex</li><li>• Meaning without behaviour</li><li>• 'Can't see Trees for the Forest'</li></ul>



view, thinking, and doing without people necessarily being consciously aware of these guiding forces (Bargh, 2014; Hagger & Chatzisarantis, 2014). To highlight this point, the late novelist David Foster Wallace (Krajeski, 2008) began his commencement speech at Kenyon College with a story about fish:

There are these two young fish swimming along, and they happen to meet an older fish swimming the other way, who nods at them and says, 'Morning, boys, how's the water?' And the two young fish swim on for a bit, and then eventually one of them looks over at the other and goes, 'What the hell is water?'

As Wallace goes on to explain, the most obvious realities are the most difficult to see when operating within a dominant paradigm; we are not always aware of the water in which we are swimming or how it may influence our approaches to and design of research and practice. Kuhn (1970) argues that when a field reaches crisis or experiences anomalies, novel approaches begin to appear causing a blurring of the dominant paradigm; a transition period develops, and, ultimately, a reconstruction of views and approaches takes place forming a new paradigm.

### Emerging paradigm: person-based, development-oriented approach

The primary catalyst for this paper comes from data that demonstrate interventions targeting adolescent physical activity have been minimally effective. Perhaps *crisis* is too strong but certainly there appears to be a pattern of results that is much less than desired. From a metatheory perspective, the primary paradigm within which these interventions are conducted could be a reason for their limited impact. In this section, we present some ideas grounded in an emerging paradigm that may provide promise and possibility for future intervention work relating to adolescent physical activity. We do not claim ownership of this perspective as we have synthesised ideas from a variety of sources. Further, we acknowledge that our biases lead us to believe that a paradigm transition is underway in the area of youth development – whether this shift will integrate with, supplement, or replace present approaches to adolescent physical activity interventions, only time will tell. Our main intent in this section is to provoke thought and discussion relating to how we go about helping adolescents with their well-being and health behaviours, focusing primarily on physical activity.

#### Person-based, development-oriented approach

We begin with the observation that the *meaning* of human behaviour has been largely ignored within a risk-reduction, prevention-oriented approach to health behaviour change across all age groups (Ekkekakis, 2009; Kimiecik, 2010; Segar & Richardson, 2014). According to some writers, even 'psychology has neglected experience for the sake of behavior' (Csikszentmihalyi, 1982, p. 13). Of course, meaningfulness is very subjective (Heintzelman & King, 2013). Within a Cartesian/biomedical paradigm that emphasises the body, behaviour, reductionism, and efficiency, subjective experience or an individual's inner life is considered too complex, too subjective, or irrelevant for inclusion in change processes. Following this rational model, any intervention within the risk-reduction, prevention-oriented approach begins and ends with the behaviour (e.g., physical activity, dietary intake, smoking cessation, etc.). And yet meaning – based on one's inner experience – has been shown to play a very significant role in people's behaviours across many different contexts, such as economics and health (e.g., Karlsson, Lowenstein, & McCafferty, 2004; Segar & Richardson, 2014). A relevant example comes from a study adopting a narrative approach to understanding adolescent girls' physical activity (Knowles, Niven, & Fawkner, 2014). In analysing the stories of 14 girls, the authors conclude that their physical activity experiences and embodied processes underlie the relationship between psychological processes and physical activity behaviour and choices.

At the dawn of the new millennium, Seligman and Csikszentmihalyi (2000) wrote a seminal piece formalising positive subjective experience into the field of positive psychology in which they recognised that building competency, not correcting weakness or deficits, was where 'major strides' in

fostering health and well-being would occur. They called for a science of ‘human strength whose mission will be to understand and learn how to foster these virtues in young people’ (p. 7). Since that time, many scholars and disciplines have attempted to answer this call, leading to a multitude of perspectives and practices. For instance, positive psychology (PP), applied developmental science (ADS), and positive youth development (PYD) are all models or approaches to human experience under the umbrella term of *development*. However, as Kuhn (1970) warned, developing paradigms typically create a blurring or chaotic state. Thus, under the guise of youth development a variety of similar terms have been utilised, many of which are not easily discernible.

Though explicitly and meticulously exploring the conceptual similarities and differences of the PP, ADS, and PYD approaches are beyond the scope of this paper, within each perspective terms such as thriving, flourishing, developmental assets, and character strengths are assumed to be essential to understanding the lives of all adolescents in varying life contexts (e.g., academic performance, health behaviours). Briefly, as stated by Seligman and Csikszentmihalyi (2000, p. 5), the aim of positive psychology (PP) is ‘building positive qualities’ and is focused on ‘valued subjective experience’. Applied developmental science (ADS) assumes the ‘potential for change represents a fundamental strength of human development’ across the lifespan (Lerner, Lerner, Bowers, & Geldhof, 2015, p. 608). Over the last two decades within youth development, PYD has emerged as a new science reflecting a more positive, holistic, and developmentally-based approach (Damon, 2004; Larson, 2000; Lerner, Phelps, Forman, & Bowers, 2009; Lerner et al., 2015). In fact, Hoyt, Chase-Lansdale, McDade, and Adam (2012) have labelled this movement a paradigm shift, in which the focus has moved from one of deterrence to that of development (see Table 1). Newman (2019) recently summarised this reshuffling in social work prevention and intervention science, stating that historically ‘the focus of youth research and programming was on *fixing* broken youth through a problem-focused approach’ as youth and their *deficits* were viewed as problematic, social ills ‘who were regarded as problems that had to be managed’ (p. 7). However, now PYD-based approaches are often strengths-based, with the goal of supporting autonomy and promoting empowerment as a way to enhance learning, growth, and development within a biopsychosocial framework.

Taken together, youth development is foundationally grounded in the idea of human plasticity. This capacity to show systematic change within varying contexts is a key belief derived from ecological systems (Bronfenbrenner, 1995) as well as relational developmental systems (Overton, 2015) metatheories. These metatheories include the idea that, through dynamic bidirectional relations between the individual and his/her environment, individuals are active producers of their own development (Lerner et al., 2015; Schwartz et al., 2007).

Therefore, while PP, ADS, and PYD have slightly different origins and emphases, for the remainder of this paper we use the term *person-based, development-oriented* (PBDO) approach as an umbrella term encompassing aspects from each of these perspectives for the purpose of understanding and promoting healthy living in adolescents. Again, Table 1 highlights some of the elements of a PBDO approach. Certainly, varying degrees of this approach are presently guiding the science of adolescent health behaviour change (e.g., autonomy-supportive environments to enhance adolescent physical activity). But in its purest paradigmatic form, PBDO *always* begins with the person, not the behaviour. It is assumed that adolescents have an inherent agency to be directed towards positive well-being (broadly defined), and that by developing and experiencing core life goods (e.g., eudaimonia, self-determination, self-expression) will develop and sustain healthy lifestyles. The subsequent two sections provide conceptual ideas and empirical evidence supporting a relationship between a PBDO approach and adolescent health-risk and health-promoting behaviour.

### **PBDO approach and adolescent health-risk behavior**

As summarised in Table 1, a main assumption guiding PBDO work is that the promotion of inner strengths, positive psychological functioning, or positive well-being of adolescents can prevent



health-compromising and/or promote health-enhancing behaviours (Flay, 2002; Schwartz et al., 2007). PBDO-based studies conducted to date provide some support for this claim, particularly in regard to health-risk behaviours. For example, a study grounded in self-determination theory (SDT; Deci & Ryan, 2000) demonstrated that adolescents with strong extrinsic aspirations or goals (e.g., image) were more likely than students with intrinsic goals (e.g., personal growth) to engage in risk-oriented behaviours (Williams, Cox, Hedberg, & Deci, 2000). The 'Five C's' (Schwartz et al., 2010; Zimmerman, Phelps, & Lerner, 2008) of positive youth development – competence, confidence, connection, character, and caring – have been found to delay initiation of substance use and sexual activity. In a sample of emerging adults, eudaimonic well-being – positive life purpose and meaning – was negatively related to frequency of marijuana use, inhalant use, prescription drug use, and riding with an impaired driver (Schwartz et al., 2011). Hoyt et al. (2012) found that positive well-being in adolescence was strongly related to participation in less risky behaviours, including binge drinking, cigarette smoking, marijuana use, and other illicit drug use in young adulthood.

From an intervention perspective, a systematic review by Jackson et al. (2011) found that PBDO-based programmes, such as HealthWise (Caldwell et al., 2004) and Positive Action (Flay & Allred, 2010), were most promising in reducing multiple health-risk behaviours in young people. HealthWise is a classroom-based programme that focuses on enhancing positive leisure life skills as a means to reduce sexual risk reduction and substance abuse. The idea is to curb boredom by helping youth develop leisure interests and make healthy, meaningful choices in one's free time (Smith et al., 2008). Adolescents with the highest levels of leisure-related intrinsic motivation had the lowest odds of partaking in health-risk behaviours (Caldwell, Patrick, Smith, Palen, & Wegner, 2010). Positive Action is a comprehensive school- and community-based programme grounded in a broad theory of self-concept that emphasises positive thoughts, feelings, and behaviours. Intervention studies over many years have demonstrated a connection between character development and reduction in health-risk behaviours, ranging from bullying to violence to smoking cessation (Flay & Allred, 2010; Lewis et al., 2016).

In contrast to a risk-reduction/prevention-oriented intervention approach, these kinds of PBDO-based interventions do not start with the notion of trying to change adolescents' health-risk behaviours through health education and rational decision-making, although some PBDO approaches include this as a component. Rather, the approach is more holistic and distal – starting with the person, not the behaviour – focusing on individual strengths more so than deficits, and incorporating positive well-being as a catalyst to growth and development leading to sustained behaviour change. Thus, PBDO-based programmes do not begin with an assumption that something is wrong with adolescents or that they are weak or immoral to be attracted to health-compromising behaviours (Burt, 2002). Instead, the end goal is prevention of health-risk behaviours through the purported protection or buffering of personal growth and development. This integrative approach is one that Schwartz et al. (2007) suggest is possible due to overlap between deterrence and development.

In sum, evidence exists to support the PBDO approach for deterring adolescents' participation in health-compromising behaviours. But, as indicated at the beginning of this paper, physical inactivity and low-quality diet are also major public health concerns that appear resistant to change. Can a PBDO approach enhance adolescent physical activity and healthy eating?

### ***PBDO approach and adolescent health-promoting behavior***

Researchers have begun to examine the potential antecedent influence of PBDO concepts, such as thriving, flourishing, or positive well-being, on adolescent as well as adult physical activity and healthy eating behaviours (e.g., Boehm, Vie, & Kubzansky, 2012; Kimiecik & Horn, 2017). At the most general or global level, a PBDO approach refers to the notion that each individual has a central inner force that produces broad patterns of behaviours and experiences. Within this meta-theoretical foundation, theoretical models or frameworks that incorporate these global, central tendencies do exist.

Grounded in SDT, the hierarchical model of intrinsic and extrinsic motivation (Vallerand & Lalande, 2011) purports that global or general motivation, reflecting broad dispositions, can be both affected by and influence contextual and situational motivation. This model incorporates reciprocity, that is, global intrapersonal dispositions (e.g., autonomy) can impact situational affect, cognition, and specific behaviours and vice versa (situational to global). In the hierarchical model, it is theorised that compared to general or global motivation, contextual and specific motivational orientations are more reliably related to specific health behaviours. One intervention study found support for this relationship in that people who were more self-determined at a general level adopted a more self-determined orientation (contextual) for healthy eating, and, in fact, reduced intake of total dietary fat and saturated fat (Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004).

The strength model of self-control (Hagger, Wood, Stiff, & Chatzisarantis, 2009) focuses on one's ability to exert control over the self and is conceptualised as a global, non-specific resource. This strength-energy model has demonstrated that a generalised level of self-control influences physical activity behaviour, and that enhancing self-regulation skill can increase physical activity behaviour (Hagger et al., 2009). In addition, within the strength model, trait self-control – an individual's capacity to exert self-control – has been shown to influence healthy eating behaviour (Hankonen, Kinnunen, Absetz, & Jallinoja, 2014). These results align with research demonstrating that people with enhanced core executive functioning (e.g., selective attention) have greater self-regulation capacity and engage in more healthful behaviours, including physical activity (Buckley, Cohen, Kramer, McAuley, & Mullen, 2014).

Sonstroem's (1997) exercise and self-esteem model, which advocates reciprocal determinism of specific to general aspects of the self, ranges from physical training to global self-esteem. Although the dominant research approach based on this model has utilised a bottom-up perspective (examination of the effects of physical activity on various aspects of the physical self), Sonstroem (1997, p. 19) does note that global self-esteem is 'a powerful determinant in people's behaviour. We tend to act as our conception of self dictates to us'. He suggests that this top-down relationship is particularly strong with respect to self-esteem and participation in health-promoting behaviours. As mentioned earlier, the Positive Action programme is based on this relationship and its curriculum is designed to foster a positive social-emotional, intellectual-, and physical-self (Flay & Allred, 2010). A matched-pair, cluster-randomized controlled trial of youth in grades 3–8 utilising this programme revealed favourable programme effects on healthy eating and exercise (Bavarian et al., 2016).

At its extreme, the PBDO approach is based on the notion that if adolescents begin to feel better about their lives in a holistic, general well-being sense (e.g., enhanced meaning and purpose) and develop positive social-emotional skills, they will be more naturally attracted to, and likely to participate in, health-promoting behaviours (Bavarian et al., 2016; Boehm et al., 2012; Kimiecik, 2010). Some studies have examined the relationship between adolescents' positive inner processes at a general level and specific health-promoting behaviours, such as physical activity and healthy eating. Carvajal (2012) examined the predictive utility of adolescents' global positive expectancies (GPE), operationalised as dispositional optimism and hope, relating to their health-risk and health-enhancing behaviours. Higher initial levels of GPE predicted healthier food choices and greater physical activity over time. Importantly, GPE did decrease over time suggesting the plasticity and changeability of these global expectancies in youth. In a prospective study, Hoyt et al. (2012) measured positive well-being by asking adolescents a number of questions about themselves (e.g., level of happiness, hopefulness, life enjoyment). The researchers then examined the effects of this positive well-being composite over time on specific health-risk and health-promoting behaviour and found that adolescents who perceived positive well-being had a more positive health behaviour profile. Also, McDade et al. (2011) demonstrated that adolescents who rated their chances to attend college exercised more in early adulthood. What this research is beginning to reveal is that how adolescents feel about themselves plays a role in their health-promoting behaviour. In essence, the more that youth can be themselves and express and experience who they want to be, the more likely they will be motivated to take care of themselves and experience healthier outcomes (Kimiecik, 2016; Ryff & Singer, 2008).

Healthy behaviours, such as eating fruits and vegetables each day and moving one's body regularly, become more connected to one's purpose and meaning in a life well lived.

As these research studies suggest, the PBDO approach shows promise for enhancement of physical activity and healthy eating behaviours in adolescents. But what are the core inner processes of this more general/distal approach that might guide adolescents to adopt and sustain these health-promoting behaviours? Although space limits an in-depth discussion, Ryff and Singer (1998) suggest three main core features of a life well lived: leading a life of purpose, quality connections with others, and positive self-regard and mastery. Ryan, Huta, and Deci (2008) propose that eudaimonic living – a state of being true to one's self and maximising unique strengths – focuses individuals on what is intrinsically worthwhile to human beings, which would lead to enhanced vitality and self-determination, reflected through intrinsic motivation. These global, inner processes – eudaimonia, subjective vitality, and intrinsic motivation – may also be involved in adolescents' health-promoting behavioural routines. For instance, adults with heightened vitality are more likely to apply their energy to behaviours and activities, such as physical activity, that are 'good' for them (Lewis, Kimiecik, Horn, Zullig, & Ward, 2014). If one approaches life with self-expressive purpose (eudaimonic), he or she has more self-directed energy (subjective vitality) to be physically active in ways that connect to healthy living. Also, studies have shown that more autonomous motives for eating healthy elicits more intrinsic need-satisfying experiences, producing more vitality and sustained healthy eating (Verstuyf, Patrick, Vansteenkiste, & Teixeira, 2012).

Although at some point these global, intrinsic processes are considered to be a more permanent part of one's personality, ADS suggests that youth and adolescents have potential for positive and adaptive self-development via the concept of plasticity (Lerner, Fisher, & Weinberg, 2000). In addition, Nota, Soresi, Ferrari, and Wehmeyer (2011) suggest that self-determination 'plays a critical role in the process of individuation and in the successful transition from adolescence to adulthood' (p. 246). In essence, adolescents who develop a strong sense of autonomy, competence, and relatedness should have a more integrated perception of the self, supportive of one's inherent tendencies toward psychological growth and development (Ryan & Deci, 2008; Soenens & Vansteenkiste, 2011; Standage, Gillison, Ntoumanis, & Treasure, 2012). From a PBDO perspective, adolescents who experience this way of living would be motivated to move their bodies as a way to connect with or enhance this intrinsic inner force. As an example, findings from a study on adolescent boys and girls demonstrated that those high in positive well-being, encompassing global levels of autonomy, competence, relatedness, and vitality, were more physically active and ate more green salad and vegetables while drinking less sugar-sweetened beverages than those low in well-being (Kimiecik & Horn, 2017). At the situational level of analysis, Dishman, McIver, Dowda, Saunders, and Pate (2015) found autonomous motivation for physical activity more strongly related to movement behaviours in middle school students than controlled motivation.

We are specifically proposing that positive inner processes (such as eudaimonia, vitality, and intrinsic motivation) at the global or dispositional level of human experience have a significant effect on adolescent health-promoting behaviours such as physical activity and healthy eating. We certainly do not claim that eudaimonia, vitality, and intrinsic motivation are the only aspects of this health-enhancing inner core, but they are a good starting point to further explore the impact of positive well-being on adolescent physical activity and healthy eating. For example, Teixeira, Patrick, and Mata (2011) point out that sustaining health behaviour change over the long-term requires a *psychological energy* that can be felt at a deep personal level in congruence with all parts of the self. Due to deeper and clearer self-meaning, it may be that positive well-being is an essential inner force for directing and sustaining behaviour change (Kimiecik & Teas, 2019).

## Implications

The goal of this paper has been to provoke thought about how we go about studying and intervening in the lives of adolescents pertaining to healthy living. Specifically, from a metatheory

perspective, we have presented two approaches – risk-reduction/prevention and person-based/development. Risk-reduction/prevention is grounded in a biomedical model and the PBDO approach fits under the PP, ADS, PYD umbrella. With an eye on paradigm, we analysed the health-behaviour change approaches to intervention work with adolescents, and noted that paradigm shifts are messy but necessary, leading to potential integration or separation of ideas and approaches to understanding and solving the problem (i.e., adolescent physical activity). Emerging from this analysis are implications for future work, or, at the very least, some things to consider when studying and enhancing adolescent well-being and their health-promoting behaviour.

Key questions should be asked: What is the status of risk-reduction/prevention-oriented interventions focused on changing adolescent physical activity? Can a more holistic development-oriented approach be integrated with a prevention-oriented approach? It could be that creative integration of both deterrence and development approaches into adolescent physical-activity interventions will enhance their effectiveness. Some of this kind of work has been conducted by including PBDO-type variables as mediators of change within physical activity interventions. For instance, enjoyment has been found to be both a mediator and moderator of adolescent physical activity within school-based physical activity interventions (Dishman et al., 2005; Schneider & Cooper, 2011). Although physical activity enjoyment – typically defined as a positive affective response encompassing generalised feelings of pleasure, liking, and fun – can have many sources (i.e., personal mastery, perceptions of competence, positive social interaction), one broad source is intrinsic factors, such as autonomy (Teixeira et al., 2011). Results from cross-sectional and prospective studies with adolescents, emerging adults, and adults show that autonomous motivation is linked to health behaviours (Ng et al., 2012). For instance, Amorose, Anderson-Butcher, Newman, Fraina, and Iachini (2016) found in a sample of high school athletes that a relatively high level of self-determined motivation for sport and physical activity was associated with autonomy support from at least two of coaches, fathers, and mothers.

Few adolescent physical activity interventions have integrated PBDO-type constructs (e.g., eudaimonia) into their design, but some have blended traditional health education classes (prevention) with autonomy-supportive environments (development). For example, the LEAP intervention utilised choice-based physical education and activities that adolescent girls may enjoy and demonstrated an eight percent increase in vigorous physical activity compared to control schools (Pate et al., 2005). Another study examined the impact of a sport-based PYD summer camp intervention on physical activity among socially vulnerable youth. Results demonstrated that the independent effects and interaction between staff and parent autonomy support significantly predicted both physical activity self-efficacy and health and fitness intentions (Anderson-Butcher et al., *in press*). Relatedly, Kulinna's (2013; Kulinna, Brusseau, Cothran, & Tudor-Locke, 2012) school-based intervention studies found that only in those schools where the personnel designed *their own* programmes did students' physical activity within and outside the school increase. Supporting these findings, results of an intervention with college students demonstrated that more young people were physically active in a programme that supported their need for autonomy (Chatzisarantis, Hagger, Kamarova, & Kawabata, 2012).

These types of interventions grounded in autonomy, intrinsic motivation, and enjoyment could be the next generation of physical activity interventions for adolescents. We suggest that this is where the adoption of a PBDO approach can serve as a catalyst to push the boundaries of designing and testing adolescent-focused interventions relating to physical activity and other health behaviours. Certainly, the integration of development within prevention-oriented physical activity interventions, as outlined above, has been a useful next step. But working from a PBDO framework (see Table 1 to review guiding principles) frees up the field to create and test other intervention possibilities. For instance, how useful is a global (distal) approach for enhancing physical activity as compared to a more contextual (proximal) intervention approach? Most adolescent interventions have been proximal: the primary focus is on trying to change a specific *behaviour*, utilising a comprehensive physical activity-based programme, and measuring intervening variables that

assess motivation for that behaviour (e.g., self-regulation for physical activity). A distal intervention approach would emphasise the *person* as the starting point via global inner processes (e.g., autonomy, eudaimonia, subjective vitality) and examine changes in those processes as they relate to adopting and maintaining health-promoting behaviours. As suggested throughout this paper, there is enough evidence to serve as a foundation to continue to test these PBDO-based approaches in a more systematic fashion.

Importantly, these PBDO interventions for enhancement of adolescents' positive well-being can not only target individuals directly (e.g., activities/classes for enhancing intrapersonal processes), but also indirectly through environmental change and community-building approaches (Dzewaltowski et al., 2009). Many factors influence the development of both positive well-being and physical activity behaviour. A review of adolescent physical activity interventions demonstrated that a combination of multiple factors (e.g., policy, environment, social networks, intrapersonal) within an ecological perspective was the most effective approach for promoting youth physical activity (Perry et al., 2012). However, as Whitley, Massey, Camiré, Boutet, and Borbee (2019) discovered in their systematic review of sport-based youth development interventions, there is much left to be desired in terms of the research used to examine and understand such factors.

Pure PBDO programmes linked to health-promoting behaviours for adolescents are rare. This is not surprising considering the emphasis on the long-term effects of health-risk behaviours for young people. But consider an intervention study (Schwartz, Kurtines, & Montgomery, 2005) that examined the effectiveness of a self-discovery identity exploration process for emerging adults. Grounded in Freire's (1973) transformative pedagogy where facilitator and participants learn together in a group collaborative process, the experience was specifically designed to enhance flow, personal expressiveness, and self-actualisation. Although this study did not examine connections between the intervention experience and health behaviours, both quantitative and qualitative findings show that the intervention was successful in affecting these self-discovery, identity-exploration processes. Similarly, Ruini et al. (2009) were able to enhance psychological well-being of high school students with a six-session, school-based intervention focused on positive emotions, autonomy, and life purpose. And Freire, Lima, Teixeira, Araujo, and Machado (2018) demonstrated positive effects with adolescents in a similar type of intervention. These kinds of studies are beginning to show that adolescents, as well as adults (Boehm et al., 2012), can be moved toward experiencing optimal psychological functioning and positive well-being. This is significant in and of itself. The next step in the process would be to conduct similar kinds of positive well-being interventions and examine their impact on health-promoting behaviours, such as physical activity and diet. The various work cited and highlighted throughout this paper would hypothesise that when the intervention context emphasises positive well-being, health-enhancing behaviours will be positively impacted.

Lastly, PBDO approaches should be designed to provide opportunities for individual self-discovery and self-expression in safe, positive, and fun environments. Similar to the facilitator's role in experiential learning pedagogy used in sport for youth development (Newman, Alvarez, & Kim, 2017), the facilitators in PBDO interventions aim to introduce opportunities where youth can experience what it feels like to be themselves, to be expressive in a way that fits them, and to help and support their peers throughout the process (see Table 1). When young people are asked what they find most enjoyable about positive well-being programmes, they cite those that are 'activity oriented', provide substantial opportunities for 'peer interaction', 'choice' and 'structure', 'being outdoors', and utilising 'high school or college students' as facilitators (DuBois, Lockerd, Reach, & Parra, 2003). These are good guidelines to keep in mind when developing and testing positive well-being experiences for youth and adolescents. As is evident, the idea of helping adolescents find and experience their own strengths and gifts is not easy. Larson (2006) has made us aware of this 'intentionality paradox', which is the dilemma faced by adults in trying to keep ownership for the activities in the hands of the youth at the same time trying to keep the activities on track.

## Conclusions

As pointed out throughout this paper, the findings of prospective studies have gone beyond a correlational relationship to show that positive well-being predicts frequency of physical activity for adolescents at later points in time (e.g., Carvajal, 2012; Hoyt et al., 2012; McDade et al., 2011). This longitudinally-based link is especially relevant as research indicates that youth who do exercise regularly are less likely to smoke cigarettes or marijuana than their less-active peers (Terry-McElrath, O'Malley, & Johnston, 2011). If it can be demonstrated that interventions conducted within the PBDO approach do, in fact, provide young people with enhanced inner resources that lead to a more physically active lifestyle, they may be even more likely to flourish and thrive as they avoid 'negative trajectories that might otherwise lead to impaired functioning' (Schwartz et al., 2010, p. 208).

We are at the very beginning stage of an emerging paradigm for enriching the lives of youth and adolescents. A PBDO approach could be part of what Breslow (2004) labelled the third revolution of health, where the focus transcends disease, and people view and experience health as a resource for everyday life. At the heart of this revolution is the implication that perhaps we slow down in our rush to help adolescents change behaviours, such as physical activity and healthy eating, and shift to exploring *with them* how they want to experience their day now – and in the future. Do they want to swim across the lake? Do they want to learn to draw? Do they want to swish a ball through a net? Do they want to invent an app or robot? Or do they just want a means to express what's burning inside them? Helping adolescents begin the journey to experience who they want to be is the real health revolution. As they engage in this self-expressive process more youth could create deeper meaning and vitality in their day and discover for themselves that physical activity may feed and nourish the life they want to live. When that happens, it should be easier for them to start and keep moving for a lifetime.

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