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Perspectives

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Integrating children's physical activity enjoyment into public health dialogue (United States)

Elizabeth Y. Barnett[1,*], Paul M. Ridker[2], Cassandra A. Okechukwu[1], and Steven L. Gortmaker[1]

[1]Department of Social and Behavioral Sciences, Harvard T.H. Chan School of Public Health, Boston, MA, USA and [2]Division of Preventive Medicine, Brigham and Women's Hospital, Boston, MA, USA

*Corresponding author. E-mail: lizzie@communicatehealth.com

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Summary

Physical activity engagement during childhood is associated with positive health outcomes in adulthood. Exercise and sport science research links physical activity enjoyment with physical activity adoption and maintenance, among other positive health behaviors. However, public health researchers rarely measure enjoyment or discuss its role in interventions or theory. In this paper, we present the rationale for bringing enjoyment to the forefront of public health dialogue and action to increase physical activity in children and across the life course. We outline five potential explanations for the lack of physical activity enjoyment research in public health, and offer solutions and action steps for each. Enjoyment research has the potential to improve people's health by working on multiple levels, from individuals to schools to public sectors, and could have positive implications for various health behaviors.

Keywords: children, physical activity, public health

INTRODUCTION

There is a strong body of evidence in public health research demonstrating that regular physical activity for children leads to positive health outcomes, such as an increase in physical fitness, a reduction in cardiovascular disease risk in adulthood and the development of overall healthier habits (Weintraub *et al.*, 2008; Drake *et al.*, 2012). Unfortunately, fewer than half of all children in the United States meet physical activity guidelines, which recommend that children accrue at least 1 h of moderate or vigorous physical activity each day (Office of Disease Prevention and Health Promotion, 2008; Troiano *et al.*, 2008). Furthermore, there is strong evidence that children's physical activity significantly declines as they enter adolescence (Troiano *et al.*, 2008; Gortmaker *et al.*, 2012). It is no surprise that this trend continues through adulthood; less than 5% of U.S. adults meet the national recommendation to obtain 30 min of physical activity per day (Troiano *et al.*, 2008).

The study of children's physical activity enjoyment provides a tremendous opportunity to influence physical activity uptake and maintenance on multiple levels, inspiring positive behaviors that promote lifelong health. Research in the field of sport and exercise psychology often cites physical activity enjoyment as an important predictor of

physical activity adoption and maintenance. Enjoyment of physical activity has been linked to intrinsic motivation to be active, physical activity adherence, self-efficacy and sustained engagement in physical activity programs (Wankel, 1970; Kendzierski and DeCarlo, 1991; Scanlan and Simons, 1992; Motl *et al.*, 2001; Moore *et al.*, 2009; Mullen *et al.*, 2011). Unfortunately, while public health research has demonstrated that regular physical activity can lead to better health outcomes, it rarely measures or prioritizes physical activity enjoyment, despite the fact that enjoyment has been linked to regular physical activity. When we searched the archives of the *American Journal of Public Health* for articles from 1911 through 2015, we found only five that contained the word 'enjoy' in the title (none contained 'enjoyment'), the most recent being from 1961. A broader search of the PubMed database of the National Library of Medicine indicated comparable results. Out of articles published through 2015, 68 819 contained the term 'physical activity' in the abstract or title, but only 446 of those also contained enjoyment. To put these results in context, self-efficacy, another predictor of physical activity, yielded 1922—over four times more articles.

Steps should be taken to better incorporate enjoyment research into public health theory, dialogue, and action. In this paper, we outline five challenges that we believe have limited physical activity enjoyment research to date in the public health sphere, provide examples, and offer solutions for each. In our discussion of the issues, we often refer to sports research because much of the work (both theoretical and methodological) that has been done on children's physical activity enjoyment comes from that field. However, enjoyment research has the potential to improve experiences of and opportunities for all different types of children's physical activity—including sports experiences, unstructured play, physical education classes, and active commuting.

CHALLENGE 1

Enjoyment is difficult to define. One challenge in enjoyment research is clearly defining the concept, and differences in opinion exist among researchers about the proper definition of enjoyment (McCarthy *et al.*, 2008). Most youth-focused sports research has defined enjoyment as 'a positive affective response to sport experience that reflects generalized feelings such as pleasure, liking and fun' (McCarthy *et al.*, 2008). However, this definition is limiting in that it expresses enjoyment merely as a positive affective response, failing to take into account two variables that have been shown to be strong predictors of enjoyment: the challenge of the activity and the skill of the individual performing the activity (Csikszentmihalyi, 1991; Engeser and Rheinberg, 2008; Abuhamdeh and Csikszentmihalyi, 2012). To address this shortcoming, some researchers liken enjoyment to 'flow,' a psychological state in which a person performing an activity feels cognitively efficient, motivated and happy (Csikszentmihalyi, 1991; Engeser and Rheinberg, 2008; Kimiecik and Harris, 2010; Abuhamdeh and Csikszentmihalyi, 2012). Flow is characterized by a feeling of full focus and involvement, and relies upon the consideration of challenge-skill balance (Csikszentmihalyi, 1991; Engeser and Rheinberg, 2008; Abuhamdeh and Csikszentmihalyi, 2012). However, both definitions fail to include social factors, such as socioeconomic status (e.g. being poor may affect access to resources that could enhance one's skill), and neither places enjoyment within the context of time (e.g. the perceived challenge of an activity may be different from 1 day to the next, or may change with practice).

SOLUTION 1

Clearly define the concept of enjoyment in research projects, and consider multiple levels of influence. Researchers studying physical activity enjoyment should be transparent about how they define the concept. Public health research could borrow from pre-established definitions, but then should situate enjoyment within multiple levels of influence and across time and space. For instance, peak physical activity enjoyment may take place when challenge and skill optimally intersect, but in public health, we recognize that this intersection depends upon the influence of intrapersonal issues, social environment, built environment and time.

Our proposed definition of enjoyment sits at the intersection of the common sports research definition and the psychology-based definition of enjoyment as 'flow.' As discussed in our paper on children's enjoyment of physical activity at a summer tennis camp, we conceptualize physical activity enjoyment as a positive affective response that reflects feelings of fun, excitement and interest at a particular time in a particular space. Furthermore, we assume that enjoyment is influenced by the perceived challenge of the activity and the perceived skill of the participant, as well as intrapersonal factors such as age, sex and race/ethnicity (Barnett *et al.*, 2017). This definition establishes enjoyment as both a positive affective response *and* a function of the skill-challenge balance of the individual performing the activity, while maintaining a public health perspective by acknowledging that context matters.

CHALLENGE 2

Enjoyment is perceived as being difficult to measure. A major challenge in enjoyment research is identifying the

most reliable, precise, reproducible and valid ways to measure it. Enjoyment is an intangible state that cannot be observed directly. However, public health research has successfully taken on the task of measuring other latent variables such as depression or anxiety. Arguably, the same approach to measurement and scale development used for phenomena such as these can be used for enjoyment.

In fact, reliable and valid measures of physical activity enjoyment do exist. For example, the 18-item PACES (Physical Activity Enjoyment Scale) consistently has been validated among children and adults (Kendzierski and DeCarlo, 1991; Motl *et al.*, 2001; Moore *et al.*, 2009; Mullen *et al.*, 2011). The Sport Enjoyment Scale, often used in sport and exercise science studies, has demonstrated construct validity and good reliability in various studies (Scanlan *et al.*, 1993; Grasten *et al.*, 2012). Furthermore, a simple three-item scale asking participants to circle a number from 1 (not at all) to 5 (very) to indicate how interesting, exciting, and fun the activity was, has shown high reliability ($\alpha = 0.88$) (Abuhamdeh and Csikszentmihalyi, 2009, 2012). Although construct validity has not yet been tested, this scale demonstrates content validity, as it was designed to reflect the conceptual definition of physical activity enjoyment. This scale only takes approximately 1 to 2 min to complete, and has the additional advantage of being readable and understandable for younger audiences. In one of our studies assessing enjoyment levels of 9–17 year-olds during activities held at a summer tennis camp, the reliability for this scale also was high ($\alpha = 0.88$; $\alpha = 0.93$ for girls; $\alpha = 0.84$ for boys) (Barnett EY, Ridker PM, Okechukwu CA, Barrett JL, Gortmaker SL, unpublished data, 2016). (Figure 1).

SOLUTION 2

Make measurement advances by further validating existing measures and developing new ones. Measurement is one of the most important areas to pursue in enjoyment research because if it is not measured well (or at all), we cannot know its significance. Although some validation studies have been conducted on existing physical activity enjoyment measures, additional studies assessing the reliability and validity of self-reporting enjoyment instruments would give researchers more clarity and confidence regarding the tools available for enjoyment research. Studying the temporal aspects of measurement (e.g. when did the enjoyment assessment take place—during or after the activity?) may help establish guidelines for which measures are most relevant for specific times. Good measures of enjoyment do exist, but so does the opportunity to create new ones. For example, physiological measures of enjoyment are unchartered territory. While the actual release of endorphins (like the ones believed to contribute to 'runner's high') is difficult to study, there are some proxies for endorphin release (Dunbar *et al.*, 2012). Validated measures would make enjoyment more accessible to researchers and would increase enjoyment's research popularity. Finally, establishing and developing related measures will contribute to the field. For example, the Australian Child Wellbeing Project measures the related construct of wellbeing, which encompasses relationships and feelings across multiple dimensions, including physical, environmental, social and emotional (Skattebol *et al.*, 2013). Enjoyment appears in the results of these wellbeing surveys across these dimensions—in the form of enjoying school and learning, enjoying time with family and friends, and participating in fun activities (Skattebol *et al.*, 2013). Projects such as this one that measure closely related variables will help to advance enjoyment measurement and research.

CHALLENGE 3

Major health behavior theories have not conceptually included enjoyment. Health behavior theories do not explicitly include enjoyment as a determinant of physical activity adoption and maintenance. Many health behavior theories underscore the importance of self-efficacy, which is the belief in a person's capability to produce given attainments (Bandura, 1977). In fact, self-efficacy is one of the most studied constructs in physical activity research, which has demonstrated a consistent relationship between self-efficacy and physical activity behavior (Heitzler *et al.*, 2010; Kuroda *et al.*, 2012). However, some research suggests that enjoyment is an even stronger predictor of physical activity behavior than self-efficacy (Lewis *et al.*, 2016).

While self-efficacy is a cognitive factor that influences behavior through beliefs in personal capabilities, enjoyment is an affective response that influences behavior through the experience or expectation of pleasure, liking, or fun (Bandura, 1977; McCarthy *et al.*, 2008; Lewis *et al.*, 2016). Self-efficacy and enjoyment are related in that an increase in one may result in an increase in the other, which then improves physical activity behavior (Lewis *et al.*, 2016). However, self-efficacy is not the same as enjoyment. For example, a standard self-efficacy assessment item may ask, 'How confident are you that you can perform 30 min of physical activity per day?' People may feel confident that they can exercise, but this does not necessarily translate to enjoyment.

ID #_____

Think about the activity you just completed. Then, circle a number to tell us what you thought about the activity.

1. How interesting was it?		
not at all interesting	1----------2----------3----------4----------5	very interesting
2. How exciting was it?		
not at all exciting	1----------2----------3----------4----------5	very exciting
3. How fun was it?		
not at all fun	1----------2----------3----------4----------5	very fun
4. How hard was it?		
very easy	1----------2----------3----------4----------5	very hard
5. How good were you at it?		
very bad	1----------2----------3----------4----------5	very good

(For researcher to complete) RA name: _____ Date: _____ Activity #: _____

Fig. 1: Activity enjoyment, challenge and skill assessment.

The exclusion of enjoyment is a huge limitation in health behavior theory.

SOLUTION 3

Incorporate the concept of enjoyment into existing health behavior theories. To conduct relevant and significant public health research and to produce successful and evidence-based public health interventions, we should ground our research in relevant theory. However, enjoyment research cannot be grounded in health behavior theory if enjoyment is an excluded concept. Future studies should find a place for enjoyment in existing theories, then attempt to test theoretical assumptions regarding the effects of enjoyment on physical activity adoption and maintenance.

In order to integrate enjoyment into health behavior theory, it must be clearly defined. Following our comprehensive definition of physical activity enjoyment, we propose a multi-level understanding of the concept that could be incorporated into existing health behavior theories. For example, we know from public health research that socio-environmental context (e.g. neighborhood characteristics or parental social support) greatly influences health behaviors, both positively and negatively (Berkman and Kawachi, 2000; McCarthy *et al.*, 2008). Likewise, these layers shape one's experience and enjoyment of physical activity. If enjoyment is to have a place in health behavior theory, it should be regarded within multiple layers of influence (Figure 2). Consistent with other ecological models referenced in public health research, each level both influences and is influenced by other levels. We specify our conceptualization of enjoyment to help public health researchers begin to consider how and where it could be inserted into health behavior theory. For example, enjoyment could be integrated into social cognitive theory, a theory of human motivation that emphasizes the dynamic, reciprocal interplay between behavior, personal factors and the environment (Bandura, 1986). Some existing constructs of social cognitive theory are loosely related to enjoyment. For instance, the construct of 'emotional coping response' gets at mood states (e.g. anxiety) that can limit a person's ability to carry out a behavior. Enjoyment, on the other hand, taps into *positive* mood states that can *facilitate* a person's ability to carry out a behavior. The inclusion of enjoyment as a construct is a small change that would make a substantial difference in the availability of useful frameworks with which to understand physical activity behavior.

CHALLENGE 4

Most large-scale interventions do not prioritize enjoyment. A strategic focus on enjoyment research and theory could have implications in public health campaigns and interventions. Large-scale, national interventions are often theory-based, and are commonly informed by adult-focused health behavior theories like social cognitive theory or the transtheoretical model (Lewis *et al.*, 2016). Federal guidelines encourage adults to 'help [children] find activities that they enjoy and that are right for

LEVEL OF INFLUENCE	EXAMPLES OF LEVEL-SPECIFIC PHENOMENA THAT RELATE TO ENJOYMENT	EXAMPLES OF LEVEL-SPECIFIC QUESTIONS TO ASK WHEN DESIGNING A PHYSICAL ACTIVITY ENJOYMENT INTERVENTION FOR CHILDREN
INTRAPERSONAL	Attitudes, beliefs, physiological responses, demographic characteristics	How do children's attitudes towards the program affect their participation in it? How does one's physiology impact one's experience of the activity?
INTERPERSONAL	Social environment, social interactions, connectedness, support	How can children's friendships and relationships enhance the intervention?
ORGANIZATIONAL	Organizational climate, culture, resources (*e.g.*, health insurance), collective efficacy	Are school administrators supportive of this intervention? Who are the advocates and what pushback can be expected?
ENVIRONMENTAL	Built environment, neighborhood characteristics (*e.g.*, violence, air quality, access to parks), weather	What community resources could be accessed that could impact physical activity opportunities and enjoyment?
POLITICAL	Health, economic, social, and educational policies	What are the physical education requirements and limitations set forth by the school system? What policies are in place that may impact kids' experiences of physical activity?
TEMPORAL	Effects of aging, historical trends	How has physical activity among children changed over the past 10 years? What can we expect to happen in the future?

Fig. 2: Conceptual understanding of levels of influence on enjoyment.

their age,' yet because enjoyment is not included in these theories, it is overlooked in national initiatives (Office of Disease Prevention and Health Promotion, 2016). Many health behavior theories have become widely accepted by government agencies, which are eager to fit their programs to the tenets of predominant models. One of the key issues with applying current theories of health behavior to initiatives is the compartmentalization of 'types' of behaviors or 'stages' of change (Wellard, 2013). As a result, national initiatives may become outcome-focused (e.g. rewarding people with incentives when they exercise), rather than process-focused (e.g. creating an enjoyable environment for physical activity so people may become internally motivated) (Wellard, 2013). For example, the American Heart Association (AHA) established a 2020 impact goal to 'improve the cardiovascular health of all Americans by 20%' (Lloyd-Jones *et al.*, 2010). Consequently, the AHA identified and widely circulated 'Life's Simple 7,' a compendium of lifestyle steps that can result in health improvements (American Heart Association, n.d.-b). In this guide, enjoyment is not specified in any of the seven steps, and any information even tangentially related to enjoyment is difficult to retrieve. For instance, at three clicks away, from the 'Get Active' step to the 'Getting Active' subpage, and finally to a choice of eight articles, a reader could access one that is entitled '5 Steps to Loving Exercise . . . Or At Least Not Hating It' (American Heart Association, n.d.-a). Life's Simple 7 fails to integrate enjoyment into its principal lessons, which would have been simple enough. What if, under the 'Get Active Tips for Success,' the AHA encouraged people to learn to identify activities they enjoy, rather than to 'learn your resting heart rate'?

Another issue stems from the fact that health promotion campaigns and interventions are, by and large, organized and run by adults. Thus, it is not unusual for adults to modify adult-centered interventions for

children, or conduct adult-focused research on children (MacDougall *et al.*, 2004). Michelle Obama, First Lady of the United States from 2009-2017, launched the 'Let's Move!' campaign, which was 'dedicated to solving the challenge of childhood obesity,' and had a website that featured specific action steps for kids ('Let's Move! America's Move to Raise a Healthier Generation of Kids,' n.d.). The 'Take Action: Kids' page invited children to 'do their part [in solving the problem of childhood obesity], especially kids like you. By eating right and being active, you can be healthy and achieve your dreams' ('Let's Move! America's Move to Raise a Healthier Generation of Kids,' n.d.). While the action steps for kids did not mention enjoyment, it was referenced in the recommendations for active communities: 'Mayors and community leaders can promote physical fitness by… providing fun and affordable sports and fitness programs' ('Let's Move! America's Move to Raise a Healthier Generation of Kids,' n.d.). And, in 2015, Obama launched the '#GimmeFive challenge,' encouraging Americans to give high-fives when they witness someone making a healthy choice. Obama promoted this initiative by performing a group '#GimmeFive' dance and encouraging people to learn the steps. Promoting healthy messages with a fun activity was certainly a step in the right direction. However, the specific goals listed for children were still outcome-oriented (e.g. citing minutes of physical activity needed per day) and adult-focused, clearly highlighting obesity prevention rather than stressing enjoyment as a fundamental reason to be active.

SOLUTION 4

Recommend that leading health professionals and representatives highlight the role enjoyment can play in healthy living. Many public health campaigns encourage large groups to start exercising for a set amount of time. However, they often fail to include physical activity enjoyment (Teixeira *et al.*, 2012). Because enjoyment is linked to physical activity sustainment, including enjoyment as a prerequisite in the intervention development stage will increase the likelihood that people will sustain the activity after the campaign ends. Health professionals should be trained to promote intrinsic participation motives that contribute to enjoyment, such as social engagement, optimal challenge and skill development, since the presence of these motives is associated with increased physical activity and long-term maintenance (Teixeira *et al.*, 2012).

Health interventions geared towards children should meet children where they are—using *their* theories of physical activity and addressing *their* motivators and barriers. For example, what types of health-related programs do children enjoy, and why? What do children think about when they think about physical activity, play and sports? How do these concepts differ from exercise or fitness? How, if at all, do they link these terms with their health (MacDougall *et al.*, 2004)? Children tend to appreciate having the opportunity to voice their opinions; researchers can learn a great deal from these eager research participants (MacDougall *et al.*, 2004). For both children and adults, national health promotion initiatives should highlight—not obscure—the role that enjoyment can play in health behavior change. Healthy People 2020, the set of nationwide health promotion goals set by the U.S. Department of Health and Human Services, should incorporate enjoyment into its 10-year agenda for improving the health of Americans. Seeking to 'improve health, fitness, and quality of life through daily physical activity,' Healthy People 2020 emphasizes that physical activity levels are positively influenced by (1) the built environment (e.g. bike lanes and parks) and (2) legislative policies that improve access to facilities (Office of Disease Prevention and Health Promotion, n.d.). Enjoyment should be added to this list. The inclusion of enjoyment would encourage program planners, city planners and legislators to think more about processes and mechanisms at play in physical activity adoption and maintenance.

National initiatives can learn from smaller-scale interventions that underscore enjoyment and have shown evidence for positive effects on health behaviors. The late researcher Antronette Yancey consistently spotlighted enjoyment in her interventions, especially in her concept of 'instant recess,' as a feasible, scalable, physical activity promotion model: '[Recess] connotes fun and enjoyment, placing physical exertion in a positive and appealing light—eagerly anticipated and awaited, not dreaded as an obligation—play not work!' (Yancey, 2009). Another intervention, the Sports, Play, and Active Recreation for Kids (SPARK) program, a physical education curriculum that was designed to be enjoyable, demonstrated a significant increase in physical activity and fitness over 2 years in the intervention vs. control group (Sallis *et al.*, 1997). Tom Robinson and his research team have disseminated to school-aged children dance-based interventions, specifically created to make weight control fun ('Child Obesity and the Need for a Social Movement, 2016; Robinson *et al.*, 2003). He calls these 'stealth interventions,' meaning that the kids are having so much fun, they forget to notice they are exercising ('Child Obesity and the Need for a Social Movement, 2016). This 'stealth' approach could be used

in national interventions, for children and adults alike. A major limitation of outcome-focused interventions—those same ones that fail to include enjoyment—is they may not be appropriate for children. For example, initiatives grounded in value-expectancy theories would assume that people are rational actors in their health-related decisions, but for most children, motivation to be active stems from physical or emotional states (e.g. feeling energized or happy), not logic (e.g. health protection or weight control) (O'dea, 2003). While an adult may be motivated to lose weight via a strict weight loss program, this approach is not appropriate for children except for those with severe obesity (Wellard, 2013). Adults may be familiar with health benefits of physical activity (e.g. weight loss or heart health), but these are likely not at the forefront of children's minds. In fact, it could be detrimental for children's long-term sustainment of physical activity if they are encouraged to play for the sake of 'keeping in shape' rather than play for the sake of playing. In research and practice, we should acknowledge the influence of enjoyment in children's initial experiences of physical activity, not only because enjoyment may improve their experience in the present state, but mainly because it plays a fundamental role in their experience of physical activity across the life course (Wellard, 2013).

CHALLENGE 5

Researching enjoyment may be seen as frivolous or confusing. Enjoyment research may be dismissed as trivial 'fun'; the term itself may delegitimize its seriousness as a research topic (Wellard, 2013). Indeed, it is difficult to prioritize physical activity enjoyment within the public health context when issues related to poverty, for instance, can preclude or encumber physical activity and/or enjoyment. However, physical activity enjoyment research can have large-scale implications at organizational (e.g. physical education programs at schools) and public policy (e.g. strategic planning for public recreational facilities) levels.

Another issue that precludes researchers from tackling enjoyment may be that enjoyment is not outcome-specific, which could be confusing for those interested in studying it. Enjoyment of physical activity is associated with a range of positive health consequences, and thus is not usually pinpointed as a predictor of one particular outcome. Although much public health attention has been allotted to physical activity's effect on childhood obesity, little focus has been given to predictors of physical activity adoption, which also can lead to prevention of excess weight gain and improved overall health. In fact, the growing emphasis on specific outcomes such as obesity (i.e. the 'obesity epidemic') perhaps further undermines enjoyment research because it shifts the focus from physical activity as recreation to physical activity as a structured weight loss program. The fact that enjoyment could be studied as a predictor or an outcome may further confuse researchers— should we investigate what leads to enjoyment, or what results from it?

SOLUTION 5

Strategically include enjoyment in the public health research agenda to begin documenting its antecedents and consequences. In order to further develop an understanding of enjoyment's impact on health behavior, we must diversify the portfolio of enjoyment studies. First, enjoyment can and should be studied both as a predictor and an outcome; we should ask not only how enjoyment leads to sustained physical activity, but also ask what leads to enjoyment. Second, while quantitative studies are necessary to test interventions and assess measurement techniques, qualitative approaches (e.g. ethnographies) could help clarify attitudes around physical activity and enjoyment. Children need opportunities to experience different types of activities so they can make their own judgments about what feels enjoyable; as this happens, researchers should be ready to capture individual stories, which can help explain some nuances that quantitative studies may miss. Children have the right to be 'properly researched'; in other words, children should be participants in research that is about them, and researchers should use methods that make it easy for children to express their attitudes, experiences, and perspectives (Beazley *et al.*, 2009). This rights-based approach is especially important in children's physical activity enjoyment research, since it relies on the participation of communities and the engagement of children.

Third, we need to utilize various types of quantitative study designs. We should embark upon straightforward randomized controlled trials to collect evidence that enjoyment really matters. One recent study randomized participants to either 'fun' or 'exercise' (Werle *et al.*, 2014). The 'fun' group was told the purpose of the activity was to do something fun, while the 'exercise' group was told that the purpose was to exercise, but both groups were assigned to follow the same one-mile walking route. In this study, researchers found that the framing of exercise as fun positively influences subsequent healthier eating. The design of and lessons from this study could serve as an example for research investigating other health outcomes, such as physical activity sustainment. Interventions with a long-term follow-up

would be beneficial in assessing how physical activity enjoyment in childhood may increase physical activity levels in adulthood. We should develop intervention evaluation research that demonstrates the effects when physical activity is accompanied by enjoyment. Further, with a well-executed longitudinal study, researchers could detect developments or changes in the population's physical activity enjoyment, and may build a better picture of how enjoyment shifts across the life course.

CONCLUSION

There is plenty of evidence for the health benefits of physical activity. Given the decline in physical activity from childhood to adolescence and through adulthood, strategies should be developed to cultivate and facilitate regular physical activity participation. Enjoyment research not only fills a gap in public health literature, but also is a crucial piece of the health behavior change puzzle. The problems and solutions outlined in this paper are interrelated. All need to be addressed to further the enjoyment research agenda. We cannot have a valid measure without a clear definition, and we cannot show significant impact without a good measure. We cannot create interventions without underlying theory, and we cannot build interventions and test theoretical concepts without well-defined research objectives. It is clear that nationwide surveillance data is needed in the area of physical activity enjoyment; without systematically collecting, analysing and interpreting enjoyment-related data, we cannot design, implement and evaluate enjoyment-related physical activity initiatives.

Physical activity enjoyment research can have significant and positive impacts in public health and in clinical settings, for both children and adults. For instance, enjoyment research could better inform how clinicians 'prescribe' physical activity for their patients. As research continues to demonstrate the importance of enjoyment in physical activity behavior, clinicians may be more thoughtful about physical activity prescription, helping their patients identify which types of activities resonate with them. They may ask questions such as, 'What activities does the patient report enjoying?'

Lessons learned from physical activity enjoyment research could be applied to other health promotion efforts. For example, how can enjoyable experiences or fun-focused interventions maximize the adoption or maintenance of positive health behaviors, such as healthy eating, sun protection, or stress management? Furthermore, physical activity enjoyment research could lead to broader enjoyment research that informs clinical and public health strategies seeking to overcome or reduce the risk of *negative* health behaviors that have 'enjoyable' qualities, such as smoking or overeating.

Establishing a clear research agenda for enjoyment does not necessitate studying it in isolation. In fact, widening the scope and encouraging cross-disciplinary collaboration with those whose work explores closely connected constructs (e.g. fun, pleasure, leisure, and play) would add value to enjoyment research. For example, in a study on fun in physical education, the authors note that fun, like enjoyment, can act as a motivator to be active; they also provide a well-rounded review of the various meanings and definitions of fun, noting the similarities and differences other researchers and educators have explored between fun, enjoyment, pleasure and play (O'Reilly *et al.*, 2001). This sort of research contributes to the solution to our initial challenge—that enjoyment is difficult to define. Moreover, there are research parallels to physical activity enjoyment in many other fields, such as play in occupational therapy, creative therapy in rehabilitation studies and pleasure in nutrition. First, play therapy research, like enjoyment research, is seeking to validate its worth (Couch *et al.*, 1998). As researchers and clinicians try to legitimize this field, it is clear that valid and reliable play assessments are needed, as well as more studies that explore and reinforce the effectiveness of play in occupational therapy (Couch *et al.*, 1998). Second, just as research links physical activity enjoyment with positive health behaviors, research on creative therapies (such as art therapy)—which can enhance patients' enjoyment levels during rehabilitation—demonstrates improvements in physical functions and in quality of life (Kongkasuwan *et al.*, 2016). Finally, just as enjoyment is under-researched, especially in relation to health, so is the related construct of pleasure. Similar to how enjoyment can inform our perceptions of health behaviors and our approach to physical activity interventions, pleasure also can inform our perceptions of health behaviors, including our approach to nutrition interventions (Coveney and Bunton, 2003).

By focusing on the development of enjoyment-related theories and methodologies, we can establish a research field that fully engages with enjoyment—one that explores related concepts, and one that makes connections across disciplines and fields, such as occupational health, rehabilitation therapy and physical education. Considering the impact that enjoyment research can have on multiple health behaviors—at multiple levels—enjoyment should be at the forefront of public health research and dialogue. It's time for public health to have some serious fun.

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