

# Journal of Applied Research on Children: Informing Policy for Children at Risk

Volume 5  
Issue 1 *Family Well-Being and Social Environments*

Article 9

2014

## Examining the Potential Disconnect Between Parents' Perceptions and Reality Regarding the Physical Activity Levels of Their Children

Guy Faulkner  
*University of Toronto*, [guy.faulkner@utoronto.ca](mailto:guy.faulkner@utoronto.ca)

Vaeda Solomon  
*University of Toronto*, [vaeda.solomon@gmail.com](mailto:vaeda.solomon@gmail.com)

Tanya Berry  
*University of Alberta*, [tanyab@ualberta.ca](mailto:tanyab@ualberta.ca)

Sameer Deshpande  
*University of Lethbridge*, [sameer.deshpande@uleth.ca](mailto:sameer.deshpande@uleth.ca)

Amy E. Latimer-Cheung  
*Queen's University*, [amy.latimer@queensu.ca](mailto:amy.latimer@queensu.ca)

Follow this and additional works at: <https://digitalcommons.library.tmc.edu/childrenatrisk>  
See next page for additional authors

### Recommended Citation

Faulkner, Guy; Solomon, Vaeda; Berry, Tanya; Deshpande, Sameer; Latimer-Cheung, Amy E.; Rhodes, Ryan; Spence, John; and Tremblay, Mark S. (2014) "Examining the Potential Disconnect Between Parents' Perceptions and Reality Regarding the Physical Activity Levels of Their Children," *Journal of Applied Research on Children: Informing Policy for Children at Risk*. Vol. 5 : Iss. 1 , Article 9.

Available at: <https://digitalcommons.library.tmc.edu/childrenatrisk/vol5/iss1/9>

The *Journal of Applied Research on Children* is brought to you for free and open access by CHILDREN AT RISK at DigitalCommons@The Texas Medical Center. It has a "cc by-nc-nd" Creative Commons license" (Attribution Non-Commercial No Derivatives) For more information, please contact [digitalcommons@exch.library.tmc.edu](mailto:digitalcommons@exch.library.tmc.edu)



---

# Examining the Potential Disconnect Between Parents' Perceptions and Reality Regarding the Physical Activity Levels of Their Children

## Acknowledgements

This study was supported in part by a Canadian Institutes of Health Research (CIHR) operating grant.

## Authors

Guy Faulkner, Vaeda Solomon, Tanya Berry, Sameer Deshpande, Amy E. Latimer-Cheung, Ryan Rhodes, John Spence, and Mark S. Tremblay

## Introduction

Physical activity is associated with a range of health benefits in children and youth.<sup>1,2</sup> Despite the efficacy of regular physical activity in providing health benefits for children, growing evidence indicates that the fitness of Canadian children has deteriorated in the past few decades.<sup>3,4</sup> Currently, only 7% of Canadian children and youth (9% of boys and 4% of girls) accumulate at least 60 minutes of moderate to vigorous physical activity (MVPA) at least 6 days per week.<sup>5</sup> Since it has been shown that physical activity levels decline with age,<sup>6</sup> it is important that healthy physical activity habits are formed during childhood that may last into adulthood.

Because parental support plays an important role in the physical activity participation of children,<sup>7,8</sup> addressing parental beliefs and perceptions about their child's physical activity is a potentially important avenue for intervention.<sup>9</sup> Consistent with the tenets of models of health behavior, if people do not believe a problem exists, they are unlikely to try and change their behavior.<sup>10</sup> If parents are to facilitate access to more physical activity opportunities for their child, they may need to be aware of whether their child is sufficiently active or not. Yet, research demonstrates the majority of parents overestimate the physical activity of their children. In the UK, it was found that 80% of parents whose children were inactive, as measured by accelerometers, overestimated their children's physical

activity levels.<sup>11</sup> Similarly, Corder and colleagues<sup>12</sup> reported that on the majority of days, parents overestimated their children's physical activity when they were actually inactive (not achieving physical activity guidelines). Notably, parent overestimation was higher for parents who reported more parent support for child physical activity. These authors suggest the burden of providing support (eg, transportation to and from physical activity events), may lead parents to assume their child is sufficiently active. Perhaps reflecting an effort justification effect,<sup>13</sup> the high effort exerted in providing support alleviates potential concerns that one's child may be inactive. In Canada, Colley et al<sup>14</sup> compared parent-reported and directly measured MVPA levels in children and found a large disparity between these two measures with parents reporting, on average, forty minutes more than was measured by accelerometer. A systematic review of differences in reported versus directly measured child physical activity found a consistent pattern of over-estimation of activity through parental report.<sup>15</sup>

This evidence suggests that strategies addressing parental overestimation of a child's participation in physical activity may thus be important in promoting physical activity for children.<sup>11,12</sup> This disconnect has recently been the focus of a mass media campaign in Canada. ParticipACTION, a national not-for-profit Canadian organization dedicated

to increasing physical activity in the Canadian population,<sup>16</sup> developed the Think Again campaign to influence children's physical activity through their parents. The campaign targeted mothers of children aged 5 – 11 years and included advertisements delivered over four two-month segments throughout 2011. The campaign was developed to increase awareness of others that it is likely their own children who are not active enough and to motivate mothers to take action to get their children more active. For example, in one public service announcement (PSA), a woman is standing against a grey backdrop and says, "My Justin swims at the community centre on the weekends. Of course he's active enough." She is then splashed with water and "Think Again" appears on the screen in large font, followed by a woman's voice reading the main message which is also shown on the screen - "fact is, kids need at least 60 minutes of physical activity per day. Every day." These and other ParticipACTION PSAs can be viewed at the ParticipACTION website.<sup>17</sup>

In a recent evaluation of these advertisements, Berry and colleagues<sup>18</sup> examined the relationship of mothers' intentions to support their child's physical activity with explicit believability and implicit agreement with the Think Again campaign, attention paid to the advertisement, attitudes, and concerns about physical inactivity. The results confirmed a disconnect existed between perception and reality

regarding physical activity levels of one's own children: only 15% of participants reported their children were active every day of the week, yet 64% believed their children got enough activity. Additionally, though participants quickly agreed that children's physical inactivity was a problem, they did not necessarily agree it was a problem for their *own* children. Further exploration and understanding of this disconnect is warranted given the important gate-keeping role parents may play for their children in facilitating physical activity.<sup>7</sup> Building on the work of Berry and colleagues,<sup>18</sup> the purpose of this study was to first qualitatively explore parents' perceptions of the Think Again advertisements in order to then examine the possible disconnect between perceptions and reality regarding their children's physical activity levels. Insights from such an investigation might inform future interventions that seek to reduce this disconnect.

## Methods

To address the aims of this research study, semi-structured interviews were conducted with 24 unrelated parents (12 mothers, 12 fathers) of children aged 5 to 11 years. This sample size was informed by research conducted by Guest, Bunce and Johnson,<sup>19</sup> exploring data variability and data “saturation” (the point at which no new information or themes are observed in data). Participants were recruited during their child’s physical activity class (swimming and tennis) at one University recreation center. Participation was voluntary and informed written consent was obtained from each participant prior to commencement of the study. Ethics approval to conduct this study was obtained from the University of Toronto’s Delegated Ethics Review Committee for the Faculty of Kinesiology and Physical Education.

Commentary on, and reactions to, a selected ParticipACTION “Think Again” advertisement (shown to parents during the interview) was first obtained by asking participants to identify the key messages presented, and to comment on the perceived potential of the clip to impact or change personal beliefs and behaviour regarding their children’s engagement in physical activity. The possible disconnect between parents’ perceptions and reality regarding their children’s physical activity levels was explored by asking participants to comment on the key

messages of the clip and on the perceived applicability of these messages to their children and family. This issue was further examined through the following questions: “Research suggests that there may be a disconnect between perception and reality regarding the physical activity levels of one’s own children – do you agree/disagree? Why?” Parents were then asked whether they thought their child was accumulating 60 minutes or more of physical activity each day of the week. They were then asked if they thought their child was sufficiently active every day. Interviews lasted approximately 30 minutes.

The audiotaped interviews were transcribed during the data collection phase by the second author. Following transcription, thematic analysis as outlined by Braun and Clarke<sup>20</sup> was used by the first and second authors to identify, name, categorize, and describe emergent phenomena. Throughout this coding process, a constant comparative method<sup>21</sup> was used to ensure that identified phenomena were compared to all others and either grouped in terms of broader themes related to parents’ reception, and reaction to the ParticipACTION PSAs in terms of understanding and perceived impact on beliefs and behaviour. Additionally, the aim of the analysis was to identify the common responses as to why there may be a disconnect between perception and reality

regarding the physical activity levels of one's own child. Quotes are used to illustrate themes with pseudonyms used in all cases.

## **Results**

### **Parents' Reception of and Reactions to ParticipACTION Public Service Advertisements**

Overall, 83% of parents (75% of mothers, 92% of fathers) liked the ParticipACTION PSAs. When asked to comment further on the PSAs, parents provided a multitude of commentary on aspects that they liked/disliked. For instance, parents who responded positively to the PSAs indicated they found the ads to be informative, concise, effective, straightforward, clear, interesting, entertaining, funny, and memorable. Zoe (mother of nine-year-old girl) commented: "I think it's [the PSA] effective because it's short and the message is really clear and it's attention-grabbing. It doesn't take a lot of your attention to absorb the message." Another parent, Henry (father of eight-year-old boy) remarked: "I think it [the PSA] was great! It was short, sweet, funny and impactful and good...something that you'd remember. It was well done." One parent, Anna (mother of eight-year-old girl) even indicated she liked the advertisement because of the light-hearted manner in which the information was presented: "It's [the PSA] positive and kind of funny.

There's no sense of blaming or shaming...it's just like 'Oh, 60 minutes a day'." Some parents also stated the advertisements reminded them of ParticipACTION PSAs that they had seen as children. Gabby (mother of seven-year-old girl) commented: "It [the PSA] reminds me of those old ParticipACTION ads I used to see when I was in grade school. I miss those ads."

Parents who responded negatively to the PSAs commonly indicated the advertisements were too brief, ineffective, exaggerated, and that they didn't anchor the claims presented. Sue (mother of eleven-year-old girl) commented: "It [the PSA] was totally ineffective. Everything was just exaggerated so much." Another parent, Dolores (mother of five-year-old boy) remarked: "I think it [the PSA] was too brief. It didn't have that much of an impact on me...the visual didn't leave an impression." Some parents also questioned the manner in which the parent figure in the PSAs was portrayed. For instance, Joe (father of eight- and eleven-year-old girls) commented: "I wonder about the characterization of the 'dumb' parent who doesn't know what is going on...I'm not sure that this is the most effective tactic for engaging parents." Further, one parent, Bill (father of eight-year-old boy) indicated that although PSAs effectively presented the information, they oversimplified the issue of increasing children's engagement in physical activity and neglected to take into consideration

social barriers faced by families: “The humour works and the message is understood but the advertisement and guidelines don’t answer the fundamental question which is access to programs.”

Some parents stated the PSAs made them feel good or relieved because their kids were achieving the physical activity recommendations presented. Hannah (mother of five- and ten-year-old boys) commented: “It [the PSA] made me feel relieved because I thought my kids were supposed to be getting an hour [of physical activity] a day. My kids are definitely covered so it makes me feel good, like I’m doing OK as a parent.” Other parents commented that seeing the advertisement made them feel bad or guilty because their children may not be getting the recommended dosage of physical activity per day. According to Greg (father of five-year-old boy): “It [the PSA] made me feel like a bad parent...in the winter time we have some activities during the week and we do some more outdoor things but a lot of time is spent inside so it wouldn’t be considered physical activity.” Similarly, some parents implied the PSAs made them feel stressed because of the challenges of scheduling additional physical activity into their family’s routine. Zoe (mother of nine-year-old girl) commented: “My first reaction was 'Oh jeeze, are we doing enough and what else should we be doing?' It [the PSA]

made me feel stressed out, that there's yet another thing we should be doing.”

Though the majority of parents stated the advertisements had no potential to change or impact current beliefs, some believed the advertisements facilitated belief and behaviour change and remarked that the PSAs enabled reflection on their children's physical activity levels and also served as a reminder of the benchmarks for their children's physical activity. For instance, Mary (mother of eleven-year-old girl and nine-year-old boy) commented: “I think people will look at that [the PSA] and start questioning and evaluating whether their kids get enough physical activity and I think that that's important for belief and behaviour change – that reflection.” Another parent, Sally (mother of eight- and six-year-old boys) stated: “They're [my children] already in programs and classes but it [the PSA] might serve as a reminder...just having that benchmark of an hour to work towards...I might change my behaviour and try to include some more physical activity into their routines.” Other parents explained that the limited potential of the PSAs to stimulate belief and behaviour change was as a result of their convictions already being consistent with the messages promoted by the PSAs, and the belief that their children were already sufficiently active. However, these parents did agree the PSAs were a

good reminder of recommended physical activity levels for their children.

For instance, Dolores (mother of five-year-old boy) commented:

No, I don't think it's going to personally change my beliefs because I've always believed physical activity is important even before seeing this ad or any ad. My kid is already very active to begin with so I don't think it'll change my practice in terms of how I encourage my child because he's already doing it but it's just a good reminder of what the guidelines are and that you're doing a good job or you need to do a bit more.

### **Parents' Disconnect Between Perception and Reality**

Despite the large proportion of parents that responded positively to the PSAs, only 42% (33% of mothers, 50% of fathers) identified the disconnect between parents' perceptions and reality regarding their children's physical activity levels as a key message in the advertisements. Conversely, all parents identified the current recommendation of at least 60 minutes of MVPA per day as a key message in the PSAs. As was intended by the advertisement, some parents indicated that seeing the advertisement facilitated reflection on whether or not their kids were achieving the recommended physical activity guidelines. For example, Mark (father of five- and eight-year-old girls) remarked: "It [the PSA] made me reflect on whether they're getting enough exercise. They may be

getting 60 minutes a day but I'm not really sure." Forty-two percent of the parents believed their children were meeting current physical activity guidelines. Irrespective of this, the majority of the parents (71%) reported their children were sufficiently active (see Table 1).

	<b>Mothers, % of mothers</b>	<b>Fathers, % of fathers</b>	<b>Total # of parents</b>	<b>% of entire sample of parents</b>
<b>Quantity of P.A.</b>				
60 mins or more/day	5 (42%)	5 (42%)	10	42%
<60 mins/day or 60 mins on some days of the week	3 (25%)	5 (42%)	8	33%
Not sure/Not indicated	4 (33%)	2 (17%)	6	25%
<b>Total %</b>	<b>100</b>	<b>101</b>		<b>100</b>
<b>Sufficiency of P.A.</b>				
Sufficiently Active	9 (75%)	8 (67%)	17	71%
Not Sufficiently Active	1 (8%)	3 (25%)	4	17%
Not sure/Not indicated	2 (17%)	1 (8%)	3	13%
<b>Total %</b>	<b>100</b>	<b>100</b>		<b>101</b>

**Table 1.** Self-reported quantity and sufficiency of child physical activity

All parents interviewed in this study indicated they did not believe that their perceptions and the reality regarding their children's physical activity levels were askew, which in itself may be a demonstration of the disconnect under discussion. For instance, Sally (eight- and six-year-old boys) commented: "I think I have a pretty good idea of how much physical activity my kids get. I might not be around them all the time but I know how their days are organized so I have a pretty fair idea of how much physical

activity they're getting." Parents did, however, agree that this disconnect was a reality for many other parents in general and offered possible explanations for its occurrence.

Parents cited over-reliance on the school system and environment for the physical activity needs of their children coupled with the inability to monitor kids' activities throughout the day as possible causes for this disconnect. Despite the inability to directly observe their children's behavior, parents may assume that their kids are accumulating physical activity throughout the day during break periods (recess and lunch) and through physical activity classes during these breaks/classes. For instance, Sharlene (mother of six-year-old boy) commented:

I think that if kids are school-aged, parents assume that school takes care of everything. So they think that their kid had gym class and was out running at recess, when really the child might not be running at recess, he might just be sitting there. So you really can't assume that the school is going to take care of everything; but I think some parents do.

Similarly, Gabby (mother of seven-year-old girl) commented: "Especially as parents are busy and kids are at school or at after school programs – that's a whole chunk of the day where parents aren't there to see what their kids are doing. So it's easy to assume they're getting enough physical activity during the day."

Most parents cited time and job constraints as *the* barrier to their kids' involvement in physical activity. According to Anna (mother of eight-year-old girl):

It [the PSA] is a good reminder especially in the winter. But because of the time and work commitments and coming home in the dark and stuff, it probably won't change my behaviour. I think the hour is a good message but it's a challenge to fit that hour in. After work you have to make dinner, help kids with homework... you're tired, you don't want to go to the park...if I leave it to the end it probably won't happen.

Similarly, Zoe (mother of nine-year-old girl) commented:

If I look at myself, for instance – I'm very busy and it's a lot to take in, and we're still relying on schools and the curriculum to take on most of the responsibility for their [kids'] activeness...Families are really busy and we're really maxed-out, so even if there's something we'd like to add, figuring how to do that is going to be really challenging.

Another parent, Mary (mother of eleven-year-old girl and nine-year-old boy) remarked: "It [the PSA] probably makes parents think about if their kids are active enough. But it would be really helpful to provide tips and suggestions to parents. Parents now are busier than ever – two income families and not a lot of free time. So how do you keep your kids active?" For many parents, making *more* time for their child to be physically activity was seen as a considerable challenge.

Parents also cited possible misconceptions about the intensity of physical activity recommended by the guidelines and a failure to attend to key physiological indicators of MVPA. It is possible that parents may consider all types of physical activities towards the quota recommended by the guidelines without consideration for the intensity and duration of the physical activities engaged in, which can lead to a disconnect between perception and reality. For instance, Dolores (mother of five-year-old boy) commented:

Some people might say it has to be sports related...you have to be involved in tennis or gymnastics. But I feel that if you go for a walk with your child after dinner, just around the park, that's another definition. So I think that leaves the definition open as to what physical activity is. I think if your child is moving in some capacity, then it counts towards the guidelines.

Parents may also fail to pay attention to key physiological indicators of MVPA such as increased heart rate and sweating, and may assume that their kids are meeting recommended levels of physical activity even in the absence of these markers. Gabby (mother of seven-year-old girl) commented, "I think there's a general lack of awareness of what moderate-vigorous physical activity is...all of the physiological markers like raised heart rate and sweating etc." Similarly, parents may consider

their kids' engagement in "active" video games towards the recommendations even though these games may not operate at the intensity recommended by the guidelines. Sharlene (mother of six-year-old boy) commented: "Parents may also be misled into thinking that their kids get enough physical activity by putting them in front of "active" video games, but the kids are barely doing anything and aren't even breaking a sweat."

Parents also suggested that perceptions and reality often differ and this disconnect is not restricted to the physical activity levels of one's kids. For instance, Peter (father of ten- and eight-year-old girls) said:

...our perceptions and reality are often askew, so I think that there's a concept – the negativity bias...if something goes bad during the day you're more aware of it than the many good things that have happened that day, so you're focussed on that. I think that you can have that same sort of effect here where if your kid is out for 45 minutes running around in the street, you think 'okay, they've got physical activity' but this perception of physical activity could spread for a number of days without the reality that they were active for one day and four or five days have gone by and they weren't active. We often choose to see what we want to see and sometimes it takes a jolt to see what is actually going on.

Similarly, parents may have a skewed or unrealistic concept of time, especially as it applies to the physical activity of their kids, which can

contribute to this disconnect. Sally (mother of eight- and six-year-old boys) commented: “I think that unless you actually clock it, you don’t realize how much 60 minutes actually is. Parents see their kids doing a little bit of physical activity and assume it’s enough; but 60 minutes is a lot of time.”

The physical appearance and stature of children may also serve to reinforce this disconnect. One parent, Hannah (mother of ten- and five-year-old boys) indicated:

If I found out that they [my kids] actually needed more [physical activity] I don’t think I would be concerned because from their physical appearance I’m confident that they’re healthy and not even close to being overweight in any sense of the word. In that case I’d question the guidelines if they didn’t seem to be lining up with my own observations.

## **Discussion**

PSAs represent one strategy for communicating health messages to the general public. The Think Again PSA was generally well-received by the parents in this study. Those parents who commented favorably on the PSAs indicated they found the ads to be informative, effective, clear, and memorable. However, parents were less optimistic that such PSAs could promote belief and behaviour change. Repeated exposure to such messaging is clearly required within a broader social marketing campaign

that also seeks to provide opportunities and solutions in helping families get more active.<sup>10,22</sup>

Most notably, our findings highlight the potential challenge in effectively addressing parental overestimation of children's physical activity. Though some parents thought the PSAs facilitated reflection on their children's physical activity levels, the majority believed that their children were engaged in sufficient amounts of physical activity each day even though their children were not necessarily meeting physical activity guidelines. Greater efforts might be needed to convey the basis of the guidelines and the importance of meeting the guidelines. The majority of parents also believed they could accurately identify the physical activity levels of their children, but that *other* parents may have some difficulty.

Using an experimental paradigm, Berry and colleagues<sup>18</sup> found similar results and they suggest that a process of cognitive dissonance<sup>13</sup> may be occurring. In the face of time demands, cognitive dissonance for parents may be reduced by denying physical inactivity is a problem for their own child. This hypothesis remains plausible in explaining the current results. For parents who felt their children were sufficiently active, the most common response was that even if they wanted their child to be more active there was not enough time in the day for this to happen.

An alternative explanation draws from Third-Person Perception (TPP) theory. According to TPP, individuals perceive greater influence of media exposure on others in society more than themselves and people they know.<sup>23,24</sup> TPP has been supported in a variety of public health contexts<sup>25</sup> although we are not aware of its application in the context of physical activity promotion. Communication scholars argue that TPP exists because of the optimistic bias individuals hold toward their existing beliefs<sup>25</sup>; these beliefs are perceived to be strong and impregnable, thus forming a solid defence against the persuasive attempts of communication efforts, especially when compared to others in society. Notably, knowledge may accentuate TPP.<sup>25</sup> That is, the more knowledgeable individuals are about the issue than others, the more individuals believe the media will influence others.

Since parents have explicit control over most aspects of their children's lives,<sup>11</sup> this disconnect remains a critical challenge for promoting physical activity if parents do not perceive the need for their children to participate in additional daily physical activity. One issue is the expectation that children are receiving doses of physical activity in school and recreation settings. This should not be unreasonable given the range of potential physical activity opportunities during the school day and the after school period. In elementary schools in Ontario, Canada, for example,

there is the Daily Physical Activity Policy that mandates 20 minutes of moderate to vigorous physical activity daily.<sup>26</sup> However, an analysis of schools in Toronto found that fewer than half of the participating children were provided with DPA every day and not a single child engaged in sustained MVPA for 20 minutes or more.<sup>27</sup> Similarly, and as highlighted by the key message of the Think Again campaign, levels of MVPA are often higher during free-play than during organized or structured activity sessions.<sup>28</sup> In one study in British Columbia, it was found that children spent less than 13% of their time in MVPA during physical education.<sup>29</sup> Increasing actual engagement in physical activity during these structured opportunities remains a pressing research and practice need. Parents may also have an important advocacy role to play in reaching out to their children's school to push for complete implementation school-based physical activity policies.

Further compounding low levels of MVPA during the school day are the barriers parents are faced with in engaging their children in physical activity such as time and job commitments. Reliance on structured, supervised programmes may actually exacerbate time challenges. Future educational campaigns could adopt a family regulatory approach<sup>30</sup> in promoting strategies that may overcome the time and scheduling barriers parents face. For example, planning as a family for physical activity in

terms of “when,” “where,” “how,” and “what” physical activity will be performed. Providing advice on how to effectively monitor a child’s physical activity, alerting parents to the physiological indicators of MVPA, providing examples of MVPA for children, and emphasizing engagement in low-cost and unstructured physical activity (eg, active school travel) and play may also be beneficial.

This study is not without limitations that should be acknowledged. The sample of parents was recruited based on convenience from children’s organized, fee-paying activity classes at a university recreation centre. Thus, it is likely the parents were from at least middle class backgrounds and predisposed to supporting their child to be physically active. While a disconnect between perceptions and reality regarding a child’s physical activity levels might be heightened among those who provide physical activity support,<sup>12</sup> the generalizability of the findings is limited. Future research is needed with a more heterogeneous sample of parents. Additionally, since no objective measure of children’s physical activity was undertaken in this study, we cannot ascertain the accuracy of parental estimation of their child’s physical activity.

## **Conclusions**

The Think Again PSAs were described as having an important role to play in increasing awareness of physical activity guidelines and stimulating reflection in some parents regarding the physical activity levels of their children. More creative approaches will be needed in addressing the disconnect in perceptions between sufficient and recommended levels of physical activity. Future social marketing campaigns will need to be tailored to help families close the gap.

## References

1. Janssen I, LeBlanc AG. Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *Int J Behav Nutr Phys Act.* 2010;7(1):40.
2. Timmons BW, Leblanc AG, Carson V, et al. Systematic review of physical activity and health in the early years (aged 0-4 years). *Appl Physiol Nutr Metab.* 2012;37(4):773-792.
3. Craig CL, Shields M, Leblanc AG, Tremblay MS. Trends in aerobic fitness among Canadians, 1981 to 2007-2009. *Appl Physiol Nutr Metab.* 2012;37(3):511-519.
4. Tremblay MS, Shields M, Laviolette M. (2010). Fitness of Canadian children and youth: Results from the 2007-2009 Canadian Health Measures Survey. *Health Reports.* 2010;21(1):7-20.
5. Colley RC, Garriguet D, Janssen I, Craig CL, Clarke J, Tremblay MS. Physical activity of Canadian children and youth: accelerometer results from the 2007 to 2009 Canadian Health Measures survey. *Health Reports / Statistics Canada, Canadian Centre for Health Information.* 2011;22(1):15-24.
6. Hallal PC, Andersen LB, Bull FC, Guthold R, Haskell W, Ekelund, U. Lancet Physical Activity Series Working Group. Global physical activity

- levels: surveillance progress, pitfalls, and prospects. *Lancet*. 2012;380(9838):247-257. doi:10.1016/S0140-6736(12)60646-1
7. Trost SG, Loprinzi PD. Parental influences on physical activity behavior in children and adolescents: A brief review. *AJLM*. 2011;5(2):171-181.
  8. Welk GJ. The youth physical activity promotion model: A conceptual bridge between theory and practice. *Quest*. 1999;51:5-23.
  9. Rhodes RE, Berry T, Craig CL, et al. (2013). Understanding parental support of child physical activity behavior. *Am J Health Behav*. 2013;37(4):469-477.
  10. Bauman A, Bowles HR, Huhman M, Heitzler CD, Owen N, Smith BJ, Reger-Nash B. Testing a hierarchy-of-effects model: Pathways from awareness to outcomes in the VERB campaign 2002-2003. *Am J Prev Med*. 2008;34(6Suppl):S249-S256.
  11. Corder K, van Sluijs EMF, McMinn AM, Ekulund U, Cassidy A, Griffin, SJ. Perception versus reality: awareness of physical activity levels of British children. *Am J Prev Med*. 2010;38(1):1-8.
  12. Corder K, Crespo N., van Sluijs EM, Lopez NV, Elder JP. Parent awareness of young children's physical activity. *Prev Med*. 2012;55(3):201-205.
  13. Festinger L. *Cognitive dissonance*. Stanford, CA: Stanford University Press; 1957.

14. Colley RC, Wong SL, Garriguet D, Janssen I, Connor-Gorber S, Tremblay MS. Physical activity, sedentary behaviour and sleep in Canadian children: Parent-reported versus direct measures and relative associations with health risk. *Health Reports / Statistics Canada, Canadian Centre for Health Information*. 2012;23(2):45-52.
15. Adamo KB, Prince SA, Tricco AC, Connor-Gorber S, Tremblay MS. A comparison of indirect vs. direct measures for assessing physical activity in the pediatric population: a systematic review. *Int J Pediatr Obes*. 2009;4(1):2-27.
16. Latimer AE, Murumets K, Faulkner G. ParticipACTION: The national voice of physical activity and sport participation in Canada. In: Marcus B, ed. *The American National Physical Activity Plan*. Human Kinetics. In press.
17. ParticipACTION. "Think Again" advertisements.  
<http://www.participaction.com/about/our-advertising-campaigns>. Updated 2013. Accessed June 3, 2013.
18. Berry T, Craig C, Faulkner G, et al. Mothers' Intentions to Support Children's Physical Activity Related to Attention and Implicit Agreement with Advertisements. *Int J Behav Med*. Prepublished November 16, 2012, doi:10.1007/s12529-012-9279-5

19. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. *Field Methods*. 2006;18(1):59-82.
20. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77-101.
21. Glaser B, Strauss A. *The discovery of grounded theory*. Chicago: Aldine; 1967.
22. Finlay SJ, Faulkner G. Physical activity promotion through the mass media: inception, production, transmission and consumption. *Prev Med*. 2005;40:121-130.
23. Davison WP. The third-person effect revisited. *IJPOR*. 1996;8(2):113-119.
24. Perloff RM. The third-person effect: A critical review and synthesis. *Media Psychol*. 1999;1:353-378.
25. Chapin J. Youth perceptions of their school violence risks. *Adolescence*. 2008;43(171):461-471.
26. Ontario Ministry of Education. Daily physical activity in schools: Guide for school boards. [http://www.edu.gov.on.ca/eng/teachers/dpa\\_boards.pdf](http://www.edu.gov.on.ca/eng/teachers/dpa_boards.pdf). Updated 2006. Accessed June 3, 2013.
27. Stone MR, Faulkner GE, Zeglen-Hunt L, Cowie-Bonne J. The Daily Physical Activity (DPA) policy in Ontario: is it working? An examination

using accelerometry-measured physical activity data. *CJPH*. 2012;103(3):170-174.

28. Trost SG, Rosenkranz RR, Dzewaltowski D. Physical activity levels among children attending after-school programs. *Med Sci Sports Exerc*. 2008;40(4):622-629.

29. Nettlefold L, McKay HA, Warburton DE, McGuire KA, Bredin SS, Naylor PJ. The challenge of low physical activity during the school day: at recess, lunch and in physical education. *Br J Sports Med*. 2011;45(10):813-819.

30. Rhodes RE, Naylor PJ, McKay HA. Pilot study of a family physical activity planning intervention among parents and their children. *J Behav Med*. 2010;33(2):91-100.