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This is the author's version of a work that was submitted/accepted for publication in the following source:

[Hamilton, Kyra, White, Katherine M., & Cuddihy, Tom](#)  
(2012)

Using a single-item physical activity measure to describe and validate parents' physical activity patterns.

*Research Quarterly for Exercise and Sport*, 83(2), pp. 340-345.

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<http://dx.doi.org/10.1080/02701367.2012.10599865>

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**Research Note**

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5 Validating and describing parents' physical activity patterns using a single-item physical  
6 activity measure tailored to current guidelines

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25 Key words: exercise, parenthood, validity testing, measurement

1           The accurate measurement of health-related physical activity (PA), which is often  
2 interpreted as either *150 minutes/week of at least moderate-intensity PA* (U.S. Department of  
3 Health and Human Services, 2008) or *at least 30 minutes of at least moderate-intensity PA on*  
4 *5 or more days* (Australian Government Department of Health and Ageing, 2005; Haskell et  
5 al., 2007), is critical for determining current PA levels and monitoring compliance with PA  
6 guidelines (Bauman, Phongsavan, Schoeppe, & Owen, 2006). Measurement instruments need  
7 to be valid, reliable, and practical (Sallis & Saelens, 2000). It has been noted that, to evaluate  
8 total levels of PA, it is necessary to include indicators of intensity, duration, frequency,  
9 energy expenditure, and type of activity (Bauman et al., 2006). These more comprehensive  
10 measures of PA, which often assess activity in a variety of domains, give a detailed  
11 assessment of people's activity levels (see e.g., Craig et al., 2003; International Physical  
12 Activity Questionnaire, 2005). However, these instruments may not be feasible to use when  
13 there are time constraints and/or limitations on research resources. Single-item PA measures,  
14 which have been examined against longer self-report measures of PA for evidence of validity,  
15 have been suggested as an alternative way of gathering information about people's PA  
16 (Milton, Bull, & Bauman, 2010). Brief single-item measures can reduce the burden on  
17 respondents as well as be more readily incorporated into other data collection systems where  
18 there may be a lack of knowledge about people's PA behavior (Milton et al., 2010). However,  
19 in their review of 14-single item measures, Milton et al. found that there is a lack of suitable  
20 single-item measures which allow for a classification of people's PA against current  
21 guidelines and a lack of validity testing of these tools against objective measurements.

22           Parents of young children are at risk for inactivity (Bellows-Riecken & Rhodes,  
23 2008); however, little is known about their PA-related behaviors. Furthermore, there is no  
24 consensus about a consistent standard of measure for assessing parental PA (Collins,  
25 Marshall, & Miller, 2007). Parents are a unique target group in relation to assessing PA as the

1 types of activities performed pre parenthood often change post parenthood; as such, leisure-  
2 time activities (e.g., sports) are frequently replaced with household (e.g., washing, cleaning)  
3 and childcare (e.g., bathing, feeding, playing with children, pushing prams) activities  
4 (Bellows-Riecken & Rhodes, 2008; Hamilton & White, 2010). Many self-report instruments  
5 do not assess household, childcare, and occupational activities inclusively (Sallis & Saelens,  
6 2000). Assessing this wider range of activities may provide a more accurate assessment of PA  
7 and, given that some of these activities (e.g., vacuum cleaning, washing windows, pushing  
8 prams) can be of sufficient intensity to confer health benefits that are associated with doing  
9 moderate-intensity activity (Brown, Ringuet, Trost, & Jenkins, 2001), should be considered  
10 when measuring parental PA (Ainsworth, 2000; Collins et al., 2007).

11         However, there is inconsistency in the measurement of PA intensity where it is  
12 suggested that more comprehensive measurements of PA, which assess total PA across all  
13 domains, often result in the majority of populations meeting the recommended 150 minutes of  
14 moderate PA each week (Craig et al., 2003). Craig et al. suggest that many of these PA  
15 minutes may not be health enhancing as the intensities are considered equivalent to the basal  
16 levels of activity adult individuals would accumulate in a day. Thus, it is suggested that  
17 higher cut-off points (e.g., at least 1-hour or more/day of moderate-intensity activity over and  
18 above the basal level of activity; see International Physical Activity Questionnaire, 2005) be  
19 considered when describing PA using such instruments. Additionally, there is inconsistency  
20 in the measurement of PA frequency where many of these instruments assess PA in terms of  
21 minutes/week or MET-minutes/week and do not assess the 'regular' (i.e., performing PA on  
22 most days of the week) nature of PA that is a key component in current guidelines. Thus, it is  
23 often difficult to assess the number of days across a week for which PA of at least moderate-  
24 intensity is being performed which, according to the current Australian Government and

1 American Heart Association guidelines, should be most days or at least 5 days of the week  
2 (Australian Government Department of Health and Ageing, 2005; Haskell et al., 2007).

3 The main aim of this study was to provide validity evidence for a single-item PA  
4 measure tailored to current PA guidelines as outlined by the Australian Government and  
5 American Heart Association (see Australian Government Department of Health and Ageing,  
6 2005; Haskell et al., 2007) against two additional measures of PA: 1) a 7-day PA recall and 2)  
7 an objective measurement of PA (i.e., pedometer steps). Additionally, we aimed to analyse  
8 the single item by the separate components of the 7-day PA recall to examine which type or  
9 intensity level it is most related to and examine the ability of the three PA measures adopted  
10 in this study to detect differences between specific subgroups of our target population.

## 11 Method

### 12 Participants and Procedure

13 The current research was carried out between September 2009 and January 2010.  
14 Ethical clearance by the University Human Research Ethics Committee was granted.  
15 Participants were 458 parents ( $n = 252$  mothers,  $n = 206$  fathers) living in Australia, but  
16 predominately in the state of Queensland (91%) with at least one child under 5 years of age.  
17 All parents were independent of each other (i.e., they were not part of a couple). The majority  
18 (96%) of the parents were in a partnered relationship with 76% of the participants indicating  
19 they were of an Australian background (none of these participants indicted as an ‘other’  
20 option that they were of an Aboriginal and Torres Strait Islander background). There was a  
21 diverse range in the demographic factors of participants’ age ( $M_{age} = 35.54$ ,  $SD = 5.40$ ; range  
22 = 21–53 years), education level (university education = 53%, non-university education =  
23 47%), work status (full-time = 49%, not full-time = 51%), and number of children (< 3  
24 children = 75%,  $\geq 3$  children = 25%). Parents were recruited via various family/parenting  
25 networks including mothers’ and fathers’ groups, baby/toddler swim schools, and child play

1 centers as well as through the local Playgroup Association, one prominent day care  
2 association, two online parenting forums in Australia, and a major Australian University's  
3 Alumni association. The self-reporting of PA in the previous week was undertaken via  
4 telephone. A sub-sample of parents ( $n = 30$ ) were recruited to wear pedometers for a 1-week  
5 period. These parents were given a face-to-face demonstration on pedometer placement (i.e.,  
6 fastening of the pedometer to a belt or waistband of participants' pants in line with the right  
7 knee). Parents were asked to wear the pedometer, if possible, for all hours except while  
8 sleeping or bathing ( $M_{hours/day} = 14.07$ ,  $SD = 1.61$ ). All pedometers were concealed so that  
9 parents were unable to view the recording of their PA.

## 10 **Measures**

11 **Single-item physical activity measure.** Self-reported PA behavior was measured on a  
12 single-item scale that was tailored to current PA guidelines (see Australian Government  
13 Department of Health and Ageing, 2005; Haskell et al., 2007). The item assessed the number  
14 of days parents had engaged in at least a moderate-intensity PA in the intervening week (i.e.,  
15 "On how many days in the course of the past week (past 7 days) have you engaged in at least  
16 30 minutes of at least a moderate-intensity PA"). The target behavior was operationalized as  
17 "any activity that makes you breathe somewhat harder than normal (e.g., brisk walking,  
18 playing energetic games with children, sweeping, cleaning gutters, regular paced swimming  
19 or cycling, low-impact aerobics) to activities that make you breathe much harder than normal  
20 (e.g., heavy manual labour, moving heavy furniture, playing strenuous games with the  
21 children, high impact aerobics, running, fast bicycling)" of which could be "built up during  
22 the day with a variety of activities of at least 10 minutes in length, or done in one session".

23 **7-day physical activity recall.** The 7-day PA recall instrument measured moderate  
24 and vigorous PA behavior. Questions have been raised as to whether parenthood does, in fact,  
25 affect people's PA or whether it is simply a methodological issue in the way PA is being

1 measured where many self-report instruments do not assess household, childcare, and  
2 occupational activities inclusively (Sallis & Saelens, 2000). Our 7-day PA recall, therefore,  
3 incorporated aspects from the International Physical Activity Questionnaire (IPAQ, Craig et  
4 al., 2003) and the Australian Women's Activity Survey (AWAS; Fjeldsoe, Marshall, &  
5 Miller, 2009). Both the IPAQ and AWAS have acceptable measurement properties  
6 comparable to that of other established PA self-reports (see Craig et al., 2003; Fjeldsoe et al.,  
7 2009). Parents' total PA was assessed from minutes spent in moderate and vigorous activity  
8 relating to the domains of employment, childcare, household, transport, and planned activities  
9 over the previous week (e.g., "Over the past week, did you do any employment related  
10 activities of vigorous effort", "During the last 7 days, on how many days did you do vigorous  
11 physical activities as part of your employment work", "How much time did you usually spend  
12 on one of those days doing vigorous physical activities as part of your employment work").  
13 Only values of 10 or more minutes of activity were included in the calculation of scores.  
14 Domain total scores were calculated by multiplying the number of days by the time self-  
15 reported in each intensity range, with total PA calculated by summing each of the domain  
16 total scores. It is suggested that more comprehensive measurements of PA often result in the  
17 majority of populations meeting the recommendations and, therefore, are not necessarily  
18 health enhancing (Craig et al., 2003). Thus, to assist in the describing of parents' PA patterns,  
19 we also calculated a measure for Health Enhancing PA (HEPA) which included the summing  
20 of total scores in the domains of transport and planned activities (Fjeldsoe et al., 2009).

21 **Pedometer steps.** An objective measure of PA was used on a sub-sample of the  
22 population ( $n = 30$ ) in which total number of steps taken, via pedometer recordings, in the  
23 intervening week was measured. Pedometers are unobtrusive and convenient for participants.  
24 They measure vertical movement, are less costly, and have been shown to have less error than  
25 heart rate monitors and some accelerometers (Eston, Rowlands, & Ingledew, 1998). Some

1 pedometers are limited in that they are unable to measure intensity, duration, or frequency of  
2 activity and cannot store information other than total counts. However, when taking into  
3 consideration the intermittent activity patterns of parents and the public health emphasis on  
4 promoting the accumulation of daily physical activity, these limitations are seen as acceptable  
5 (Eston et al., 1998). The Walk4Life pedometer used in the current study has shown to be both  
6 reliable and valid in measuring adults' habitual PA (Crouter, Schneider, Karabulut, & Bassett,  
7 2003; Schneider, Crouter, & Bassett, 2004).

### 8 **Statistical analysis**

9 Data analyses were performed using SPSS v17 and assumed alpha of 0.05. Means and  
10 Pearson's correlation coefficient was used to describe the single-item PA measure and  
11 pedometer steps. Given the significant skew in the 7-day PA recall data (according to the  
12 Kolmogorov-Smirnov tests), median values were used for descriptive purposes. Spearman's  
13 correlation coefficient (which is a distribution free test) was used to assess the concurrent  
14 validity between this measure and the single-item tool. Coefficient values of  $<0.2$  were  
15 considered weak, 0.21-0.4 fair, 0.41-0.6 moderate, 0.61-0.8 strong, and 0.81-1.0 very strong  
16 correlations (Milton et al., 2010). Further tests were conducted to examine the ability of each  
17 of the PA measures to detect differences between specific subgroups that are likely to (or have  
18 in previous research) differ(ed) in their level of PA (e.g., gender, ethnicity, education, number  
19 of children, work status). T-tests were performed to examine differences between means of  
20 each of the subgroups and PA (as measured by the single-item and pedometer steps) and  
21 Mann-Whitney tests were performed to examine differences between the medians of the  
22 subgroups and PA (as measured by the 7-day recall measure).

### 23 **Results**

24 As shown in Table 1, the average number of days parents self-reported they performed  
25 PA of at least a moderate intensity was 3.04 ( $SD = 2.05$ ) with an average of 46516.07 ( $SD =$



1 19134.44) steps being taken over the 1-week period. There was no significant difference in  
2 the number of PA days self-report on the single-item measure between those parents wearing  
3 and not wearing pedometers,  $t(456) = .90, p = .367$ . The median total amount of moderate and  
4 vigorous PA self-reported across all domains was 420 minutes, with parents accumulating a  
5 median of 100 minutes of HEPA over the previous week. Fathers engaged in more total  
6 median minutes of moderate and vigorous PA than mothers.

7 Concurrent validity of the single-item PA measure was assessed against the self-report  
8 PA measure of 7-day PA recall and the objective PA measure of pedometer steps (see Table  
9 2). The results revealed a moderate correlation ( $r_s = 0.51, p < .001$ ) between the single-item  
10 and 7-day PA recall and a very strong correlation ( $r = 0.81, p < .001$ ) between the single-item  
11 and pedometer steps. Content validity of the single-item PA measure was assessed also  
12 against the specific domains and intensity levels of the 7-day PA recall. The results revealed  
13 that the single-item was most strongly related to planned activities ( $r_s = 0.51, p < .001$ ) with  
14 fair to moderate correlations revealed between the single-item and both the intensity levels.

15 Table 3 reports on the ability of each of the PA measures adopted in the current study  
16 to detect differences between specific subgroups of our target population. As shown in table  
17 3, across the total sample, no significant differences were revealed between the subgroups of  
18 gender, age, ethnicity, education, number of children, and work status and parents' PA as  
19 measured by the single-item and pedometer steps. Significant differences between gender,  
20 education, and work status and total PA as measured by the 7-day PA recall were revealed.  
21 The results indicate that fathers compared to mothers, those with a non-university degree  
22 education compared to a university degree education, and those working full-time compared  
23 to not working full-time performed significantly more total minutes of moderate and vigorous  
24 PA across the 1-week period.

25 **Discussion**

1           There is a lack of suitable single-item measures which allow for a classification of  
2 people's PA against current guidelines as outlined by the Australian Government and  
3 American Heart Association (Australian Government Department of Health and Ageing,  
4 2005; Haskell et al., 2007). Furthermore, there is a paucity of information about parental PA  
5 patterns. Thus, we aimed to examine the validity of a single item scale that was tailored to  
6 current PA guidelines.

7           We found that parents, on average, were engaging in at least 30 minutes of at least a  
8 moderate-intensity PA on 3 days of the week. This finding supports the scant literature  
9 suggesting that many parents are not meeting current PA guidelines (i.e., performing 5 days  
10 or more of at least a moderate-intensity PA). Using a more comprehensive measure of PA, a  
11 7-day PA recall which assessed activity in the domains of employment, childcare, household,  
12 transport, and planned activities, we found that parents' total median level of moderate and  
13 vigorous PA exceeded the recommended amount of PA (i.e., 150 minutes/week; U.S.  
14 Department of Health and Human Services, 2008). However, more comprehensive  
15 measurements of PA often result in the majority of populations meeting the recommended  
16 minutes per week of moderate PA and, therefore, is not necessarily health enhancing (Craig et  
17 al., 2003). Thus, we investigated parents' HEPA which assessed PA across the domains of  
18 transport and planned activities (Fjeldsoe et al., 2009) and found that parents median amount  
19 of HEPA activity was only 100 minutes across the 1-week period. Overall, these findings  
20 highlight both mothers and fathers as lacking regular activity to gain health benefits and the  
21 importance for further investigations into factors that influence parental PA.

22           In assessing the concurrent validity of the single-item measure, we found a moderate  
23 and very strong correlation between the single-item and 7-day PA recall (0.51) and pedometer  
24 steps (0.81), respectively. Single-item PA measures, in general, are found to exhibit moderate  
25 correlations with longer self-report measures of PA and weaker correlations with objective

1 measures, such as accelerometers (Milton et al., 2010). Thus, the concurrent validity of the  
2 single-item measure is within the range of previous studies assessing the validity of single-  
3 item tools against longer self-report measures but stronger than those assessed against  
4 objective measurements. These findings support previous research that suggest single-item  
5 PA measures are an acceptable tool for assessing people's PA levels (Milton et al., 2010).  
6 Furthermore, our single-item measure was most strongly related to the planned activities  
7 domain (as measured by the 7-day PA recall) and had fair to moderate correlations with each  
8 of the PA intensity levels (i.e., moderate and vigorous). These findings suggest that the single-  
9 item is tapping physical activities of both moderate and vigorous intensity and better taps  
10 parents' perceptions of more structured type activities (e.g., walking for exercise, social  
11 sports, running). The findings, therefore, provide evidence for the content-related validity of  
12 the single-item PA measure and suggest that the measure may be a useful and practical tool  
13 for assessing parents' PA, especially given that the measure is measuring more those activities  
14 that are considered health enhancing (i.e., planned type activities and activities of a moderate  
15 and vigorous intensity; Fjeldsoe et al., 2009). Thus, for those groups where more  
16 comprehensive self-report or more objective measures are not practical or financially viable,  
17 this single-item measure may be particularly useful.

18 In examining differences between each of the PA measures and specific subgroups  
19 that are likely to (or have in previous research) differ(ed) in their level of PA (e.g., gender,  
20 age, ethnicity, education, number of children, work status), we found little support for the  
21 ability of the single-item and pedometer steps to detect any differences. These findings  
22 suggest that the single-item measure may still lack the ability to detect more subtle differences  
23 among parents with young children or, alternatively, suggest that parenthood is the key factor  
24 affecting PA levels. Total minutes spent doing moderate and vigorous PA (as measured by the  
25 7-day PA recall), however, was able to detect significant differences between the subgroups

1 of gender, education, and employment. The findings revealed that fathers performed more PA  
2 than mothers, which supports the current literature (Bellows-Riecken & Rhodes, 2008).  
3 Education and employment were also found to differ significantly. However, contrary to  
4 expectations, those with a non-university degree compared to a university degree and those  
5 working full-time compared to not working full-time were found to perform significantly  
6 more PA. Together, these results could be explained by a cluster of adults in active jobs (i.e.,  
7 males employed in more manual labouring type jobs) and suggest that differences between  
8 subgroups of people, as measured by more comprehensive measures of PA that assess total  
9 PA across several domains, might only be assessing PA patterns of adults across multiple life  
10 contexts (see Rovniak et al., 2010).

11 Several limitations of this study should be noted. First, the single-item measure only  
12 assessed frequency of a defined intensity; therefore, it is difficult to assess the duration of PA  
13 performed other than spending at least 30 minutes a day. Second, the objective measurement  
14 of PA (i.e., pedometer steps) was only assessed on a sub-sample of the participants who may  
15 have been more aware of the activity in which they were participating. Furthermore, although  
16 the sub-sample did not differ from the total sample on PA levels as measured by the single-  
17 item, caution should be taken in interpreting the evidence for the validity of the single-item  
18 compared to the objective measure due to the low sample of parents wearing pedometers.  
19 Future research, then, should continue to examine the single-item measure against objective  
20 measurements and, in particular, using objective measures that assess intensity and duration  
21 of activity. Third, the majority of participants in the current study were in a partnered  
22 relationship and of an Australian background which may limit transferability of the data  
23 across different family characteristics and cultural groups. Fourth, we only assessed parents'  
24 moderate and vigorous PA over a 1-week period and it is not established whether the single-  
25 item measure has the ability to detect changes in people's PA overtime, which is important

1 given that the effectiveness of PA interventions rely on the accurate measurement of PA  
2 behavior (Bauman et al., 2006). Finally, the PA of only one parent from each family was  
3 assessed. Taking a multilevel approach may yield better measures of parental PA as the  
4 influence of family-level factors above and beyond that of individual-level factors can be  
5 assessed. A multilevel approach allows for compositional effects of parents' PA to be  
6 assessed (i.e., the extent to which differences in parents' PA are because of the family  
7 contexts in which they live).

## 8 **Conclusions**

9 In conclusion, we found support for the scant research which suggests parents are a  
10 group at risk for inactivity. Specifically, parents on average are engaging in only 3 days/week  
11 of at least moderate-intensity PA of at least 30 minutes duration and are only accumulating a  
12 median of 100 minutes of HEPA. These figures fall far short of current PA recommendations.  
13 We were also able to provide some evidence to support the concurrent validity of the single-  
14 item PA measure which was tailored to current guidelines. This brief PA tool may be useful  
15 for examining the PA behavior of parents who are a very busy and time-pressed population.

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## References

- 1  
2 Ainsworth, B. E. (2000). Issues in the assessment of physical activity in women. *Research*  
3 *Quarterly for Exercise and Sport*, 71, S37-S42.
- 4 Australian Government Department of Health and Aging. (2005). *An active way to better*  
5 *health: national physical activity guidelines*. Retrieved from  
6 [http://www.health.gov.au/internet/main/publishing.nsf/Content/phd-physical-activity-](http://www.health.gov.au/internet/main/publishing.nsf/Content/phd-physical-activity-adults-pdf-cnt.htm/$File/adults_phys.pdf)  
7 [adults-pdf-cnt.htm/\\$File/adults\\_phys.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/phd-physical-activity-adults-pdf-cnt.htm/$File/adults_phys.pdf)
- 8 Bauman, A., Phongsavan, P., Schoeppe, S., & Owen, N. (2006). Physical activity  
9 measurement - a primer for health promotion. *Promotion & Education*, 13, 92-103.  
10 doi:10.1177/10253823060130020103
- 11 Bellows-Riecken, K. H., & Rhodes, R. E., (2008). A birth of inactivity? A review of physical  
12 activity and parenthood. *Preventive Medicine*, 46, 99-110.  
13 doi:10.1016/j.ypmed.2007.08.003
- 14 Brown, W., Ringuet, C., Trost, S., & Jenkins, D. (2001). Measurement of energy expenditure  
15 of daily tasks among mothers of young children. *Journal of Science and Medicine in*  
16 *Sport*, 4, 379-385.
- 17 Collins, B. S., Marshall, A. L., & Miller, Y. D. (2007). Physical activity in woman with young  
18 children: How can we assess “anything that’s not sitting”? *Women & Health*, 45, 95-  
19 116. doi:10.1300/J013v45n02\_06
- 20 Craig, C. L., Marshall, A., Sjöström, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., ...  
21 Oja, P. (2003). International Physical Activity Questionnaire: 12-country reliability  
22 and validity. *Medicine & Science in Sports & Exercise*, 35, 1381-1395.  
23 doi:10.1249/01.MSS.0000078924.61453.FB

- 1 Crouter, S. E., Schneider, P. L., Karabulut, M., & Bassett, D. R. (2003). Validity of 10  
2 electronic pedometers for measuring steps, distance and energy cost. *Medicine &*  
3 *Science in Sports & Exercise*, 35, 1455-1460.
- 4 Eston, R. G., Rowlands, A.V., & Ingledew, D. K. (1998). Validity of heart rate, pedometry,  
5 and accelerometry for predicting the energy cost of children's activities. *Journal of*  
6 *Applied Physiology*, 84, 362-371.
- 7 Fjeldsoe, B. S., Marshall, A. L., & Miller, Y. D. (2009). Measurement properties of the  
8 Australian Women's activity survey. *Medicine & Science in Sports & Exercise*, 41,  
9 1020-1033. doi:10.1249/MSS.0b013e31819461c2
- 10 Hamilton, K., & White, K. M. (2010). Understanding parental physical activity: meanings,  
11 habits, and social role influence. *Psychology of Sport and Exercise*, 11, 275-285.  
12 doi:10.1016/j.psychsport.2010.02.006
- 13 Haskell, W., Lee, I., Pate, R., Powell, K. E., Blair, S. N., Franklin, B. A., ... Bauman, A.  
14 (2007). Physical activity and public health: Updated recommendation for adults from  
15 the American College of Sports Medicine and the American Heart Association.  
16 *Circulation*, 116, 1081-1093. doi:10.1161/CIRCULATIONHA.107.185649
- 17 International Physical Activity Questionnaire. (2005). Guidelines for data processing and  
18 analysis of the International Physical Activity Questionnaire (IPAQ). Retrieved from  
19 <http://www.ipaq.ki.se/scoring.pdf>
- 20 Milton, K., Bull, F. C., & Bauman, A. (2010). Reliability and validity testing of a single-item  
21 physical activity measure. *British Journal of Sports Medicine*, 45, 203-208.  
22 doi:10.1136/bjism.2009.068395
- 23 Rovniak, L. S., Sallis, J. F., Saelens, B. E., Frank, L. D., Marshall, S. J., Norman, G. J., ...  
24 Hovell, M. F. (2010). Adults' physical activity patterns across life domains: Cluster  
25 analysis with replication. *Health Psychology*, 29, 496-505. doi:10.1037/a0020428

1 Sallis, J. F., & Saelens, B. E. (2000). Assessment of physical activity by self-report: Status,  
2 limitations, and future directions. *Research Quarterly for Exercise and Sport*, 71, S1-  
3 S14.

4 Schneider, P. L., Crouter, S. E., & Bassett, D. R. (2004). Pedometer measures of free living  
5 physical activity: comparison of 13 models. *Medicine & Science in Sports & Exercise*,  
6 36, 331-335.

7 U.S. Department of Health and Human Services (2008). *2008 physical activity guidelines for*  
8 *Americans*. Retrieved from <http://www.health.gov/paguidelines/pdf/paguide.pdf>

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## 1 Table 1

2 *Descriptive Profile of Parents' Physical Activity-related Behaviors*

	Total sample ( <i>N</i> = 458)	Mothers ( <i>n</i> = 252)	Fathers ( <i>n</i> = 206)
PA-related behavior	<i>M</i>	<i>M</i>	<i>M</i>
Current guidelines (days/wk) - Number of days across a 1-week period on the single-item measure	3.04	2.94	3.16
7-day PA recall measure (mins/wk)	Median ( <i>M</i> )	Median ( <i>M</i> )	Median ( <i>M</i> )
Total activity <sup>a</sup>	420 (592.97)	385 (513.04)	480 (691.32)
Health enhancing physical activity <sup>b</sup>	100 (152.77)	115 (144.20)	90 (163.31)
Domains & Intensities (mins/wk) <sup>c</sup>			
Employment	- (128.04)	- (42.07)	- (233.82)
Child care	80 (144.04)	75 (148.25)	90 (138.87)
Domestic activities	120 (168.12)	90 (178.52)	120 (155.32)
Transport	- (45.62)	- (46.16)	- (44.95)
Planned activities	60 (107.15)	60 (98.05)	60 (118.36)
Moderate	280 (395.67)	270 (369.08)	280 (428.38)
Vigorous	115 (200.63)	90 (147.22)	178 (266.35)
Pedometer steps (# of steps/wk) – Total number of steps across a 1-week period	Total sample ( <i>N</i> = 30)	Mothers ( <i>n</i> = 19)	Fathers ( <i>n</i> = 11)
	<i>M</i>	<i>M</i>	<i>M</i>
	46516	47613.16	44621.09

3 *Note.* <sup>a</sup>Total time in minutes across all domains self-reported on the 7-day recall measure. <sup>b</sup>Time in  
4 minutes across the transport and planned activity domains self-reported on the 7-day recall measure.  
5 <sup>c</sup>Time in minutes self-reported on the 7-day recall measure across the different PA domains and  
6 intensities.

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1 Table 2  
 2 *Concurrent and Content Validity Analysis of the Single-item Physical Activity Measure against 7-day*  
 3 *Physical Activity Recall and Pedometer Steps*

7-day PA recall measure (mins/wk)	Total sample ( <i>N</i> = 458)	Mothers ( <i>n</i> = 252)	Fathers ( <i>n</i> = 206)
	<i>r<sub>s</sub></i>	<i>r<sub>s</sub></i>	<i>r<sub>s</sub></i>
Total activity <sup>a</sup>	0.51***	0.53***	0.48***
Health enhancing physical activity <sup>b</sup>	0.59***	0.66***	0.53***
Domains & Intensities (mins/wk) <sup>c</sup>			
Employment	0.14**	0.18**	0.13 <sup>†</sup>
Child care	0.27***	0.33***	0.19**
Domestic activities	0.15**	.014**	0.18**
Transport	0.28***	0.26***	0.32***
Planned activities	0.51***	0.57***	0.44***
Moderate	0.39***	0.42***	0.37***
Vigorous	0.51***	0.52***	0.49***
Pedometer steps (# of steps/wk)	Total sample ( <i>N</i> = 30)	Mothers ( <i>n</i> = 19)	Fathers ( <i>n</i> = 11)
	<i>r</i>	<i>r</i>	<i>r</i>
	0.81***	0.85***	0.77***

4 *Note.* <sup>a</sup>Total time in minutes across all domains self-reported on the 7-day recall measure. <sup>b</sup>Time in  
 5 minutes across the transport and planned activity domains self-reported on the 7-day recall measure.

6 <sup>c</sup>Time in minutes self-reported on the 7-day recall measure across the different PA domains and  
 7 intensities.

8 <sup>†</sup>*p* = .07. \*\**p* < 0.01. \*\*\**p* < 0.001.

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1 Table 3  
 2 *Differences in Physical Activity Levels between Sub-samples of Parents as Measured by the Single-*  
 3 *item Physical Activity Measure, Pedometer Steps, and the 7-day Physical Activity Recall*

Demographic characteristics	Single-item PA		Pedometer steps		7-day PA recall <sup>a</sup> (Total minutes PA)	
	<i>M</i>	<i>t</i>	<i>M</i>	<i>t</i>	<i>M<sub>rank</sub></i>	<i>z</i>
Gender		-1.14		0.41		-2.55*
Mother	2.94		47613.16		213.82	
Father	3.16		44621.09		245.44	
Age		-0.55		-0.16		-1.28
< 40 years	3.01		46368.68		231.87	
≥ 40 years	3.15		4857.50		245.44	
Children		1.50		-1.44		-0.16
< 3 children	3.12		44581.15		232.34	
≥ 3 children	2.79		59093.00		214.85	
Education		-1.69		1.33		-3.16**
No university degree	2.86		46534.15		248.27	
University degree	3.19		45483.00		209.31	
Ethnic background		-1.43		-1.33		-0.16
Not Australian	2.79		38934.63		228.73	
Australian	3.11		49272.95		227.10	
Work		-0.48		0.31		-2.36*
Not full-time	2.99		47621.33		214.13	
Full-time	3.08		45410.80		243.42	

4 *Note.* <sup>a</sup>Total time in minutes across all domains self-reported on the 7-day recall measure.

5 \**p* < 0.05. \*\**p* = 0.01.

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