

A theoretical approach to segmenting children's walking behaviour

Journal:	<i>Young Consumers</i>
Manuscript ID:	YC-07-2014-00461.R1
Manuscript Type:	Research Paper
Keywords:	market segmentation, children, walking, Theory of Planned Behaviour, social marketing

A theoretical approach to segmenting children's walking behaviour

Introduction

While market segmentation is almost ubiquitously applied in commercial marketing (Cody, 2012), it has received less attention in marketing aiming to change behaviours for the benefit of individuals, communities and/or society (Raval and Subramanian, 2004; Walsh *et al.*, 2010). This is unexpected given market segmentation is considered a fundamental component of social marketing (Andreasen, 2002; National Social Marketing Centre, 2006), which aims to change the ideas and behaviours of target audiences for the social good (Peattie and Peattie, 2009). Growing pressure to demonstrate return on investment for social marketing programs (Evans-Lacko *et al.*, 2013), however, is likely to increase the focus on market segmentation as a means to ensure optimal resource allocation. That is, market segmentation is based on the principle that the efficiency and effectiveness of marketing can be optimised by identifying groups with similar needs and wants, selecting the group/s most aligned with organisational goals and targeting the group/s with a tailored offering (Dibb, 1998).

In particular, there has been limited examination and application of segmentation in marketing aiming to improve the health of children (exceptions McLeay and Oglethorpe, 2013; Olds *et al.*, 2013). This dearth of research is surprising given increasing concern regarding childhood obesity. Childhood obesity is now considered a foremost public health crisis in both developed and developing countries (Wang and Lim, 2012) owing to its growing prevalence and detrimental effects on children's physical and psychological health in the short and long term (see Reilly *et al.*, 2003; WHO, 2014). Since studies in commercial marketing highlight substantial differences between segments in the child, adolescent and

1
2
3 young adults markets (see Akturan *et al.*, 2010; Cody, 2012; Foscht *et al.*, 2010), continued
4
5 examination of the principle of market segmentation in social marketing aiming to improve
6
7 the health of children is arguably warranted. As such, application of the principle of market
8
9 segmentation within this context forms the focus of the present research.
10

11
12
13 Although a number of environmental and perinatal factors have been found to underlie
14
15 childhood obesity (Ebbeling *et al.*, 2002), increases in children's weight have coincided with
16
17 declines in active transportation, such as walking, to and from school (Salmon *et al.*, 2005).
18
19 Research shows that active transportation to school is associated with greater levels of
20
21 physical activity and lower levels of obesity while controlling for diet (Mendoza *et al.*, 2011).
22
23 Walking to and from school in particular may be a low cost (Rosenberg *et al.*, 2006), near
24
25 universally accessible means of reducing children's weight (Scott *et al.*, 2007) that can be
26
27 easily integrated into daily routine (Brophy *et al.*, 2011). As such, walk to school behaviour
28
29 forms the specific behavioural context of this research.
30
31
32
33
34
35

36 A further consideration is that theories of behaviour can enhance the value of market
37
38 segmentation by helping to identify factors that influence behaviour change for different
39
40 segments (Doner Lotenberg *et al.*, 2012). This proposition is consistent with evidence
41
42 showing that programs that promote the rejection of risky behaviours and the adoption of
43
44 protective behaviours are more likely to be effective if they are informed by theory (Gordon
45
46 *et al.*, 2006). Accordingly, the present research will extend existing literature by employing
47
48 the Theory of Planned Behaviour (TPB) (Ajzen, 1991) within the segmentation process to
49
50 provide additional insight for improving the health of children, particularly as it relates to
51
52 changing intentions to increase walking to/from school.
53
54
55
56
57
58
59
60

1
2
3 This study therefore contributes to the literature in two primary ways. First, it extends
4
5 research into market segmentation within social contexts. In particular, the research provides
6
7 insight into the validity of market segmentation within the context of positively changing the
8
9 physical activity behaviour of children. Further, by employing the TPB, this research
10
11 provides further empirical insight into the usefulness of theories of behaviour in market
12
13 segmentation. Specifically, it investigates the usefulness of the TPB factors (subjective
14
15 norms, attitude, perceived behavioural control and behavioural intentions) in identifying
16
17 distinct target segment groups.
18
19

20
21
22 The article is structured as follows. First, we provide a review of the marketing segmentation
23
24 literature within social contexts. Following this, the conceptual framework of the study is
25
26 outlined. Next, details of the methodology of the current research are presented. Last the
27
28 results of the research, along with their implications, are outlined.
29
30
31

32 33 34 **Using market segmentation in changing behaviours for social good** 35 36

37
38 Just as in commercial contexts, through systematic segmentation, marketers aiming to change
39
40 behaviour for social good can identify groups of individuals most in need (Donovan and
41
42 Henley, 2003) or most willing or able to make the desired behaviour change (Doner
43
44 Lotenberg *et al.*, 2012). Although it is acknowledged that there is debate about the ethicality
45
46 of a market segmentation approach (see Newton *et al.*, 2013), what remains uncontested is
47
48 that segmentation can increase the efficiency and effectiveness of social marketing efforts
49
50 (Andreasen, 2002; Kotler and Lee, 2008; McLeay and Oglethorpe, 2013). This is particularly
51
52 relevant given social marketing programs are often supported by only limited resources
53
54 (Newton *et al.*, 2013). Despite this, segmentation has only been applied in a few studies
55
56
57
58
59
60

1
2
3 within social marketing (e.g. Fine, 1980; Gray and Bean, 2011; Rimal *et al.*, 2009; Walsh *et*
4 *al.*, 2010). These studies, however, show that not only do distinct market segments exist
5
6 within social contexts, but they have differential responses to social marketing programs
7
8 (Gray and Bean, 2011; Walsh *et al.*, 2010). Gray and Bean (2011) employ psychographic,
9
10 behavioural and demographic variables to segment the market and gain insight into the
11
12 responses of identified segments to hypothetical incentives to encourage household energy
13
14 conservation. Walsh *et al.* (2010), on the other hand, segmented the smoker market on the
15
16 basis of psychographic variables and found the segments responded differentially to social
17
18 advertising encouraging smoking cessation.
19
20
21
22
23

24
25 In particular, only a few empirical studies have examined market segmentation in social
26
27 marketing aiming to improve the health of children as it relates to targeting overweight and
28
29 obesity (exceptions McLeay and Oglethorpe, 2013; Olds *et al.*, 2013). Olds *et al.* (2013)
30
31 employed psychographic segmentation to identify three distinct segments of parents and their
32
33 children based on their attitude toward obesity. The attitudinal beliefs of these three segments
34
35 provided insights for the tailoring of anti-obesity social marketing initiatives in Australia.
36
37 McLeay and Oglethorpe (2013) examined demographic and psychographic variables to
38
39 identify four segments of Nigerian parents based on their knowledge of nutrition and diet, as
40
41 well as their food purchasing behaviour for their children. Both studies emphasise the
42
43 importance of a segmented social marketing approach to target obesity reduction, thereby
44
45 improving the health of children.
46
47
48
49
50

51
52 Specifically in the context of walk to school behaviour, there has been no previous attempt to
53
54 employ segmentation to generate market insights. Extant research focuses on examining the
55
56 demographic characteristics of the target audience that influence walk to school behaviour.
57
58
59
60

1
2
3 For instance, walking to and from school has been found to be less prevalent in girls (Yeung
4 *et al.*, 2008) and children from higher socio-economic backgrounds (Spallek *et al.*, 2006), but
5
6
7 more prevalent in older children (e.g. Rodriguez and Vogt, 2009; Yeung *et al.*, 2008). The
8
9 number of cars owned by the household and the distance to school are factors frequently
10
11 reported to negatively impact children's active transportation to school (e.g. Merom *et al.*,
12
13 2006; Timperio *et al.*, 2004). In addition to demographic factors, parental concern or
14
15 perceived risk with regard to road safety and unwelcome approaches by strangers has also
16
17 been found to reduce the instance of children walking to and/or from school (Merom *et al.*,
18
19 2006).
20
21
22
23

24
25 Given the limited research in the area, it is not surprising that few marketing programs aiming
26
27 to improve children's health are based on segmentation and targeting efforts. Two exceptions
28
29 are Power Play (see Keihner *et al.*, 2011) and Team Nutrition (see Levine *et al.*, 2002).
30
31

32 Power Play used ten grade-specific activities to target eating behaviours. For example, Grade
33
34 4 children made a plan to include at least five servings of fruit and vegetables in their day,
35
36 and Grade 5 children made a plan that incorporated fruit and vegetables and limited
37
38 unhealthy foods. In a similar way, Team Nutrition also used grade-specific activities for 1)
39
40 pre-kindergarten and kindergarten, 2) first and second grades, and 3) third through fifth
41
42 grades.
43
44
45

46
47 Overall, the limited examination and application of market segmentation, particularly as it
48
49 relates to improving children's health, highlights the need for further research in this domain.
50

51 This research aims to contribute to addressing this gap in the literature employing an
52
53 approach that utilises all four segmentation bases, namely demographic, geographic,
54
55
56
57
58
59
60

1
2
3 behavioural and psychographic (Dibb *et al.*, 2002), while simultaneously encompassing the
4
5 Theory of Planned Behaviour (TPB), which is discussed next.
6
7

8 9 10 **Conceptual framework**

11
12
13
14 The TPB has been previously employed to segment markets within social contexts such as
15
16 travel behaviour (see Anable, 2005). However, to the knowledge of the authors, the TPB has
17
18 not previously been applied by segmentation studies within the physical activity context.
19
20 Nevertheless, the TPB has been widely applied to improve understanding of the determinants
21
22 of physical activity (Scott *et al.*, 2007). A meta-analysis across 72 studies demonstrated the
23
24 explanatory power of TPB for this type of health behaviour (Hagger *et al.*, 2002). Since this
25
26 meta-analysis, Rhodes and Courneya (2003) have found that the TPB explained 32% of the
27
28 variance in adults' intentions to exercise and 28% of exercise behaviour, with the strongest
29
30 predictors in the model being attitude and perceived behavioural control. This suggests that
31
32 the TPB is a suitable framework for improving understanding of a market for the purpose of
33
34 changing physical activity behaviour.
35
36
37
38
39

40 The TPB posits that voluntary behaviour can be predicted based on the behavioural intention
41
42 of the individual. In turn, behavioural intention is proposed to be jointly determined by
43
44 positive attitude, subjective norms and perceived behavioural control. Attitude is a tendency
45
46 to evaluate or appraise a behaviour favourably or unfavourably (Ajzen, 1991). Attitude
47
48 comprises both instrumental (i.e. belief-based) and affective (i.e. emotion-based) components
49
50 (French *et al.*, 2005). Subjective norms relate to the individual's perception of whether
51
52 important reference groups support or reject the behaviour (Ajzen, 1991). Subjective norms
53
54 are formed by an individual's perception of the normative beliefs held by important others
55
56
57
58
59
60

1
2
3 towards the behaviour together with the extent to which the individual is motivated to comply
4
5 with these normative beliefs (Manning, 2009). Last, perceived behavioural control refers to
6
7 “peoples’ perception of the ease or difficulty of performing the behaviour of interest” (Ajzen,
8
9 1991, p. 183). It reflects individuals’ belief regarding their access to external resources and
10
11 opportunities needed to perform a behaviour.
12
13

14 15 16 **Method**

17 18 19 20 *Target population*

21
22 The target population for this research was caregivers (e.g. parents, grandparents, etc.)
23
24 responsible for getting a child to and/or from school in Victoria, Australia. About 20-25% of
25
26 Australian children are overweight or obese (Olds *et al.*, 2010). This study focused on
27
28 primary school children, typically aged between five and 12 years old, on the basis that
29
30 lifelong physical activity patterns are established in childhood and as such, early childhood
31
32 intervention is important to achieving long term improvements in health (Faulkner *et al.*,
33
34 2009). It was decided to focus on caregivers, rather than children themselves, given parental
35
36 control over younger children’s transportation to school (Carver *et al.*, 2010).
37
38
39
40
41
42

43 44 *Online survey*

45
46 An online survey was used to collect data. Online advertising was used to disseminate the
47
48 survey through multiple channels, including Facebook and Twitter. The survey took
49
50 approximately 10 minutes to complete and respondents were offered the equal chance of
51
52 winning one of twenty AUS\$30 gift cards for their participation. The online survey
53
54 comprised previously validated scales for the TPB constructs: subjective norms (Perugini and
55
56 Conner, 2000), perceived behavioural control (Rhodes and Courneya, 2003), attitude
57
58
59
60

1
2
3 (Norman and Conner, 2006; Scott *et al.*, 2007) and behavioural intention (Rundle-Thiele *et*
4 *al.*, 2013). The survey was pre-tested via an informal expert review with seven social
5
6 marketing researchers. On the basis of feedback, the readability of the introduction to the
7
8 survey was improved and the ordering of some questions altered. The study was given ethics
9
10 approval by the Human Research Ethics Committee (Approval no. MKT/27/13/HREC) at
11
12
13
14 (*institution withheld to preserve author anonymity*).

15 16 17 18 *Sample*

19
20 We collected a purposive sample of 512 caregivers of primary school children in Victoria,
21
22 Australia. Non-probability sampling is considered acceptable in exploratory research such as
23
24 this study (Malhotra, 2004). Further, the sample size is comparable to 40% of data-driven
25
26 segmentation studies in a systematic review, which contain between 200 and 500 sample
27
28 objects (Dolnicar, 2002). The sample comprised mostly employed (64.5%) mothers (87.8%).
29
30 The largest proportion of respondents was aged between 40 and 44 years old (31.1%) and had
31
32 achieved a trade certificate or diploma (31.8%). The children that formed the focus of the
33
34 survey were relatively evenly spread in terms of their age, from five years to 12 years old,
35
36 with the largest proportion of children being seven years old (18.7%). There was also an even
37
38 split in terms of the children's gender (female: 48.2%, male: 51.8%). Approximately 50%
39
40 (51.6%) of the sample reported that their child usually walked to or from school, with
41
42 approximately 20% walking to (22.6%) or from (19.9%) school five days a week. The
43
44 walking rate obtained by this study appears higher than results showing approximately 25%
45
46 of Australian children walked to school in 2003 (van der Ploeg *et al.*, 2008), although the
47
48 measurement compatibility across these two studies is unclear.
49
50
51
52
53
54
55
56
57
58
59
60

Analysis

First the reliability and validity of the TPB construct scales were examined. Specifically, a confirmatory factor analysis was undertaken in SPSS AMOS 21. After data cleaning, including listwise deletion of cases with missing values, a final sample size of 432 was achieved. Given the data was missing completely at random (Little's MCAR test $>.05$), listwise deletion of missing data was used since it does not introduce any bias into the data set (Allison, 2003). The measurement model demonstrated close fit to the data: $\chi^2 (80, n = 432) = 129.422$, Bollen-Stine $p < .05$; $\chi^2/df = 1.618$; CFI = .994; TLI = .992; RMSEA = .038; and SRMR = .0313. Further, the standardized factor loadings were all significant and above .70, with the exception of one perceived behavioural control item ($\Lambda = .692, p < .05$). The observed variables' squared multiple correlations (R^2) all exceeded .50, with the exception of the same perceived behavioural control item which again closely approached the cutoff ($R^2 = .479$). Moreover, All Cronbach's Alpha coefficients (see Table 1) exceeded .70. The perceived behavioural control item was retained on the basis that modifications to models should be done sparingly and only when theoretically plausible (Jackson *et al.*, 2009). Convergent validity was established since the composite reliabilities for each construct exceeded .70 and the average variance extracted (AVE) for each construct exceeded .50 (see Table 1). Since the squared correlation between each pair of constructs was less than the corresponding AVEs, this provides evidence of discriminant validity.

Insert Table 1

After summing the scale items, following the procedures set out by Norusis (2011), two-step cluster analysis in SPSS 21 was used to reveal natural groupings in the data set (containing 512 respondents). Two-step cluster analysis is considered the most appropriate

1
2
3 technique for this study given its exploratory nature, specifically since neither the number nor
4
5 the members of the clusters are known (Chan *et al.*, 2006). Further, two-step cluster analysis
6
7 forms clusters based on both continuous and categorical data (Norusis, 2011). As such, two-
8
9 step cluster analysis has previously been applied in segmentation studies (e.g. Chan *et al.*,
10
11 2006; McLernon *et al.*, 2012). In the first step, original cases are grouped into pre-clusters
12
13 based on log-likelihood distance (Okasaki, 2007). In the second step, this is then reduced to
14
15 the best number of clusters on the basis of Schwartz's Bayesian information criterion (BIC)
16
17 (Norusis, 2011). The 14 variables selected for analysis covered the four bases of
18
19 segmentation (Dibb *et al.*, 2002): demographic (i.e. employment and education status,
20
21 income, age of the child and the caregiver, number of cars owned by the household, number
22
23 of children under the care of the respondent), geographic (i.e. approximate distance to
24
25 school), psychographic (i.e. subjective norms, perceived behavioural control and attitude) and
26
27 behavioural (i.e. walking behaviour and behavioural intentions). Chi-square and One-way
28
29 ANOVA tests were performed on the categorical and continuous variables respectively to
30
31 validate the significant differences among clusters.
32
33
34
35
36
37
38

39 **Results and discussion**

40
41
42 Three distinct clusters were revealed within the data set using 14 segmentation variables,
43
44 including the TPB variables (instrumental attitudes, affective attitudes, perceived behavioural
45
46 control, subjective norms and behavioural intentions). The silhouette coefficient, which is a
47
48 measure of cohesion and separation, was 0.1 (Norusis, 2011). This is comparable to other
49
50 market segmentation studies (see Lamont and Jenkins, 2013). Chi-square and One-way
51
52 ANOVA tests confirmed the clusters varied significantly across the 14 segmentation
53
54 variables, with the exception of caregivers' highest level of educational attainment ($\chi^2 =$
55
56
57
58
59
60

1
2
3 16.406, d.f. = 10, $p = 0.089$). This result is unsurprising given education's importance level
4
5 (Importance = 0.01), which was the lowest of all segmentation variables (refer to Table 2).
6
7 An importance rating of between 0.8 and 1.0 indicates the variable was highly important to
8
9 cluster formation, whereas a rating of between 0.0 and 0.2 indicates the variable was less
10
11 important (Norusis, 2011).
12
13

14
15
16 Four variables were found to be highly important to cluster formation in the present study:
17
18 distance to school (Importance = 1.00), current walk to/from school behaviour (Importance =
19
20 0.84), subjective norms (Importance = 0.53) and caregivers' intentions to increase their
21
22 child's walk to school behaviour (Importance = 0.23). The approximate distance between the
23
24 child's home and their school was the most important variable in defining the clusters. This is
25
26 consistent with research showing distance to school is an important factor in active
27
28 transportation to school (e.g. Merom *et al.*, 2006; Timperio *et al.*, 2004).
29
30
31

32
33
34 The three segments identified by the research were roughly equally sized. Segment 1, '*Short-*
35
36 *distance Frequent Walkers*' (37.8%), was slightly larger than segment 2, '*Long-distance Non-*
37
38 *Walkers*' (33.0%), and segment 3, '*Middle-distance Sporadic Walkers*' (29.2%). The results
39
40 showed the majority of *Short-distance Frequent Walkers* live less than 1km from the child's
41
42 school. Approximately 65% of the children within this segment reportedly walked to/from
43
44 school seven times per week on average. In contrast, children from the *Middle-distance*
45
46 *Sporadic Walkers* segment reportedly walked 2.7 times on average per week to/from school,
47
48 which is situated at a distance of less than 2km from home for most (54.9%). *Long-distance*
49
50 *Non-Walkers* live the greatest distance from school, with the majority (62.3%) living greater
51
52 than 5km from the school. Not unexpectedly, the children within this segment do not
53
54 typically walk to/from school (less than once on average per week). Further, the data shows
55
56
57
58
59
60

1
2
3 that on average, *Long-distance Non-Walkers* do not intend to increase the number of times
4
5 their children walk to/from school ($M = 1.9$, $SD = 1.6$). Similarly, neither *Short-distance*
6
7 *Frequent Walkers* ($M = 3.8$, $SD = 2.2$) nor *Middle-distance Sporadic Walkers* ($M = 3.9$, $SD =$
8
9 2.2) have positive intentions to increase the number of times their children walk to/from
10
11 school.
12

13
14
15
16 *Insert Table 2*
17

18
19
20 Moreover, the results showed that *Short-distance Frequent Walkers* on average hold a very
21
22 strong belief that people important to them would approve of their child walking to/from
23
24 school ($M = 5.7$, $SD = 1.2$). This belief was weaker for *Middle-distance Sporadic Walkers* (M
25
26 $= 4.5$, $SD = 1.6$). In contrast to the other two segments, *Long-distance Non-Walkers* believed
27
28 that people important to them would disapprove of their child walking to/from school ($M =$
29
30 3.1 , $SD = 1.6$), which may be attributable to the greater distance to school for the majority of
31
32 this segment. Specifically, there may have been greater perceived concern over road safety
33
34 given the distance, a factor identified in extant research as significantly influencing walk to
35
36 school behaviour (Merom *et al.*, 2006). In addition, these findings appear to be consistent
37
38 with the predictions of the TPB when taken together with the average walk to school
39
40 behaviour of children in the segments (see Ajzen, 1991). That is, it seems the more or less
41
42 supportive each segment perceives others to be of their children walking to school
43
44 corresponds to higher or lower levels of walking behaviour in the segment. Although
45
46 empirically testing this relationship is beyond the scope of this study, future research could
47
48 test this proposition within this behavioural context.
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 *Long-distance Non-Walkers* perceived the least, on average, control over their child's walk to
4 school behaviour ($M = 4.4$, $SD = 2.2$) compared to *Middle-distance Sporadic Walkers* ($M =$
5 5.7 , $SD = 1.4$) and *Short-distance Frequent Walkers* ($M = 5.9$, $SD = 1.3$). Again this finding
6
7 appears to be consistent with the TPB, with greater perceived control corresponding to higher
8
9 walk to school behaviour across the segments (Ajzen, 1991). In addition to the greater
10
11 distance to school, this result may be attributable to the fact that the *Long-distance Non-*
12
13 *Walkers* comprises the highest proportion of employed individuals (81.2%). Full time
14
15 employment may have negatively impacted this segment's belief regarding their access to
16
17 sufficient time to facilitate their child walking to/from school. In contrast, *Middle-distance*
18
19 *Sporadic Walkers* are mostly engaged in home duties (55.7%).
20
21
22
23
24
25
26

27
28 Although all three segments possessed a positive instrumental attitude toward walking to
29
30 school behaviour, *Short-distance Frequent Walkers* held the strongest belief that walking to
31
32 school was beneficial, good and valuable ($M = 6.7$, $SD = 1.0$). *Short-distance Frequent*
33
34 *Walkers* also held the strongest belief that walking to school was exciting, pleasant and
35
36 enjoyable ($M = 6.2$, $SD = 0.9$). Given that the children of this segment demonstrated the most
37
38 frequent walk to school behaviour, this finding also appears consistent with the TPB's
39
40 specification that positive attitude toward the behaviour leads to performance of the
41
42 behaviour. Interestingly, however, *Long-distance Non-Walkers* possessed a more positive
43
44 instrumental and affective attitude than *Middle-distance Sporadic Walkers* even though their
45
46 children walked to/from school less often. This finding contradicts previous research showing
47
48 attitudes, relative to subjective norms and perceived behavioural control, have the most
49
50 pervasive influence on intentions to engage in physical activity (Hagger *et al.*, 2002) and
51
52 walking (Eves *et al.*, 2003; Scott *et al.*, 2007). This suggests that other factors, such as
53
54 distance to school, may be repressing walk to school behaviour for *Long-distance Non-*
55
56
57
58
59
60

1
2
3 *Walkers* despite positive attitudes being held by this segment. Further, more broadly, this
4
5 finding highlights the possibility of variation in the capacity of behavioural theories, such as
6
7 the TPB, to explain and predict the behaviour across segments within a broader target
8
9 audience and provides an important avenue for future research.
10
11

12 13 14 **Implications** 15 16 17

18 The present research extends research in market segmentation within social marketing. In
19
20 particular, by employing the TPB, this research provides further empirical insight into the
21
22 potential for inclusion of behavioural theories within the process of market segmentation.
23
24 Specifically, the study demonstrates the usefulness of the TPB factors (subjective norms,
25
26 attitude, perceived behavioural control, and behavioural intentions) in identifying distinct
27
28 segments. This result provides empirical evidence supporting the value of employing
29
30 behavioural theories in market segmentation (Doner Lotenberg *et al.*, 2012), with three of the
31
32 four highly important segmentation variables in this study representing TPB constructs. In
33
34 contrast, demographic factors typically investigated in active transportation research, such as
35
36 the number of cars owned by the household, the age of the child and the socio-economic
37
38 status of caregivers (e.g. Merom *et al.*, 2006; Rodriguez and Vogt, 2009; Spallek *et al.*, 2006;
39
40 Yeung *et al.*, 2008), were not found to be as important in segmenting the market.
41
42
43
44
45
46

47 The research provides insight into the validity of market segmentation within the context of
48
49 positively changing the physical activity behaviour of children. Three distinct segments of
50
51 caregivers were identified in the study, each with unique attitudes toward and beliefs about
52
53 their primary school children walking to/from school. The existence of distinct segments may
54
55 provide additional insight to the finding that most programs report only a small level of
56
57
58
59
60

1
2
3 effectiveness or a slight increase in children's active transportation to school (Chillón *et al.*,
4
5 2011). That is, it is possible that these programs may be having a differential effect on
6
7 distinct segments within the market, consistent with extant literature in social marketing
8
9 (Gray and Bean, 2011; Walsh *et al.*, 2010), possessing a greater effect in some segments than
10
11 others and confounding the overall program effect. This proposition should be tested in future
12
13 research.
14
15

16
17
18 For social marketers working toward improving children's physical activity levels,
19
20 particularly walk to school levels, this research provides market insights. The study identifies
21
22 three distinct market segments that could be targeted by social marketing programs. In
23
24 comparison to *Short-distance Frequent Walkers*, there exists a greater need to increase walk
25
26 to school behaviour for the *Middle-distance Sporadic Walkers* and if possible, the *Long-*
27
28 *distance Non-walkers* segments. *Long-distance Non-walkers* are the second largest segment;
29
30 however, they tend to live further than 5kms from school. This poses a significant
31
32 environmental barrier to walking to school (e.g. Merom *et al.*, 2006) and may be reducing
33
34 this segment's perceived behavioural control, which is the lowest of the three segments.
35
36 Social marketing programs could focus on creating opportunities for *Long-distance Non-*
37
38 *walkers* to walk a part of the distance to school. A walking school bus, for instance, could be
39
40 initiated starting 1km from school from a central point like a train station. Such strategies
41
42 should increase the segment's perceived behavioural control, which reflects individuals'
43
44 beliefs regarding access to resources and opportunities needed to perform a behaviour (Taylor
45
46 *et al.*, 2005), and subsequently, lead to higher levels of walk to and from school behaviour
47
48 according to the TPB (Ajzen, 1991).
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 *Middle-distance Sporadic Walkers* mostly live less than 2kms from school and possess, on
4
5 average, a more positive intention to increase their child's walk to school behaviour. Based
6
7 on the analysis, social marketing programs could target the subjective norm perceptions of
8
9 *Middle-distance Sporadic Walkers*, as well as their attitude, to encourage increased walk to
10
11 school behaviour in line with the TPB (Ajzen, 1991). The social norms approach could be
12
13 employed to change this segment's social norm perceptions regarding children walking to
14
15 and from school. The social norms approach corrects misperceptions about, or increases the
16
17 saliency of, the social norms surrounding the target behaviour typically through traditional
18
19 media (Burchell *et al.*, 2013). In terms of attitude, it may be beneficial for programs to focus
20
21 on augmenting *Middle-distance Sporadic Walkers'* belief that walking to school is beneficial
22
23 and enjoyable specifically, given their mean affective attitude score was the lowest of all
24
25 three segments.
26
27
28
29
30
31

32 **Conclusion**

33
34
35
36 This research aimed to further investigate the applicability of market segmentation within
37
38 social contexts related to improving the health of children. The results showed three distinct
39
40 market segments within the walk to school context that were clearly defined by the TPB
41
42 constructs. Caregivers within these segments possessed significantly different beliefs and
43
44 attitudes towards their primary school children walking to/from school. However, given the
45
46 purposive sampling technique employed by this exploratory study, the generalisability of the
47
48 results is limited. A larger scale study is recommended to extend our understanding and to
49
50 permit generalisability. Furthermore, whether the segments identified by this research
51
52 respond to social marketing programs differently was not investigated. A longitudinal
53
54 research design is recommended to permit an examination of response for each of the
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

segments identified in the current study to a social marketing intervention targeting walking behaviour for school children. Nevertheless, this study provides a basis for future research investigating the applicability and usefulness of market segmentation in marketing aiming to change the physical activity behaviours of children, an important focus given the increasing prevalence and consequence of childhood obesity.

For Peer Review

References

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
- Ajzen, I. (1991), "The theory of planned behaviour", *Organizational Behavior and Human Decision Processes*, Vol. 50, pp. 179-211.
- Akturan, U., Tezcan, N. and Vignolles, A. (2011), "Segmenting young adults through their consumption styles: A cross cultural study", *Young Consumers*, Vol. 12 No. 4, pp. 348-360.
- Allison, P. (2003), "Missing data techniques for structural equation modelling", *Journal of Abnormal Psychology*, Vol. 112 No. 4, pp. 545-557.
- Anable, J. (2005), "Complacent car addicts' or 'aspiring environmentalists'? Identifying travel behaviours segments using attitude theory", *Transport Policy*, Vol. 12, pp. 65-78.
- Andreasen, A.R. (2002), "Marketing social marketing in the social change marketplace", *Journal of Public Policy & Marketing*, Vol. 21 No. 1, pp. 3-13.
- Brophy, S., Cooksey, R., Lyons, R., Thomas, N., Rodgers, S. and Gravenor, M. (2011), "Parental factors associated with walking to school and participation in organised activities at age 5: Analysis of the millennium cohort study", *BMC Public Health*, Vol. 11, pp. 14-23.
- Burchell, K., Rettie, R. and Patel, K. (2013), "Marketing social norms: Social marketing and the 'social norm approach'", *Journal of Consumer Behaviour*, Vol. 12, pp. 1-9.
- Carver, A., Timperio, A., Hesketh, K. and Crawford, D. (2010), "Are children and adolescents less active if parents restrict their physical activity and active transport due to perceived risk?", *Social Science & Medicine*, Vol. 70, pp. 1799-1805.
- Chan, M.F., Chung, L.Y.F., Lee, A.S.C., Wong, W.K., Lee, G.S.C., Lau, C.Y., Lau, W.Z., Hung, T.T., Liu, M.L. and Ng, J.W.S. (2006), "Investigating spiritual care perceptions

- 1
2
3 and practice patterns in Hong Kong nurses: Results of a cluster analysis”, *Nurse*
4
5 *Education Today*, Vol. 26, pp. 139-150.
- 6
7 Chillón, P., Evenson, K., Vaughn, A. and Ward, D. (2011), “A systematic review of
8
9 interventions for promoting active transportation to school”, *International Journal of*
10
11 *Behavioral Nutrition and Physical Activity*, Vol. 8, pp. 10-27.
- 12
13
14 Cody, K. (2012), “BeTWEEN two worlds: Critically exploring marketing segmentation and
15
16 liminal consumers”, *Young Consumers*, Vol. 13 No. 3, pp. 284-302.
- 17
18
19 Dibb, S. (1998), “Market segmentation: Strategies for success”, *Marketing Intelligence &*
20
21 *Planning*, Vol. 16 No. 7, pp. 394-406.
- 22
23
24 Dibb, S., Stern, P. and Wensley, R. (2002), “Marketing knowledge and the value of
25
26 segmentation”, *Marketing Intelligence & Planning*, Vol. 20 No. 2, pp. 113-119.
- 27
28
29 Dolnicar, S. (2002), “A review of data-driven market segmentation in tourism”, *Journal of*
30
31 *Travel & Tourism Marketing*, Vol. 12 No. 1, pp. 1-22.
- 32
33
34 Doner Lotenberg, L., Schechter, C. and Strand, J. (2012), “Segmentation and targeting”, in
35
36 Hastings, G., Angus, K. and Bryant, C. (Eds.), *The SAGE Handbook of Social*
37
38 *Marketing*, Sage Publications, London, pp. 125-136.
- 39
40
41 Donovan, R.J. and Henley, N. (2003), *Social Marketing: Principles and Practice*, IP
42
43 Communications, East Hawthorn, Victoria.
- 44
45
46 Ebbeling, C., Pawlak, D. and Ludwig, D. (2002), “Childhood obesity: Public-health crisis,
47
48 common sense cure”, *The Lancet*, Vol. 360 No. 9331, pp. 473-482.
- 49
50
51 Evans-Lacko, S., Henderson, C., Thornicroft, G. and McCrone, P. (2013), “Economic
52
53 evaluation of the anti-stigma social marketing campaign in England 2009-2011”, *The*
54
55 *British Journal of Psychiatry*, Vol. 202, s95-s101.
- 56
57
58
59
60

- 1
2
3 Eves, F., Hoppe, R. and McLaren, L. (2003), "Prediction of specific types of physical activity
4 using the Theory of Planned Behavior", *Journal of Applied Biobehavioral Research*,
5 Vol. 8 No.2, pp. 77-95.
6
7
8
- 9
10 Faulkner, G. E. J., Buliung, R. N., Flora, P. K. and Fusco, C. (2009), "Active school
11 transport, physical activity levels and body weight levels of children and youth: A
12 systematic review", *Preventative Medicine*, Vo. 48, pp. 3-8.
13
14
15
- 16 Fine, S. H. (1980), "Toward a theory of segmentation by objectives in social marketing",
17 *Journal of Consumer Research*, Vol. 7 No. 1, pp. 1-13.
18
19
20
- 21 Foscht, T., Maloles, C., Schloffer, J., Chia, S-L. and Sinha, I. (2010), "Banking on the youth:
22 The case for finer segmentation of the youth market", *Young Consumers*, Vol. 11 No.4,
23 pp. 264-276.
24
25
26
- 27 French, D. P., Sutton, S., Hennings, S. J., Mitchell, J., Wareham, N. J., Griffin, S.,
28 Hardemand, W. and Kinmonth, L. (2005), "The importance of affective beliefs and
29 attitudes in the theory of planned behavior: Predicting intention to increase physical
30 activity", *Journal of Applied Social Psychology*, Vol. 35 No. 9, pp. 1824-1848.
31
32
33
34
35
- 36 Gordon, R., McDermott, L., Stead, M. and Angus, K. (2006), "The effectiveness of social
37 marketing interventions for health improvement: What is the evidence?", *Public
38 Health*, Vol. 120 no.12, pp. 1133-1139.
39
40
41
42
- 43 Gray, D. M. and Bean, B. (2011), "Can social marketing segmentation initiatives be used to
44 increase household electricity conservation?", *Journal of Nonprofit & Public Sector
45 Marketing*, Vol. 23 No. 2, pp. 269-305.
46
47
48
- 49 Hagger, M. S., Chatzisarantis, N. L. D. and Biddle, S. J. H. (2002), "A meta-analytic review
50 of the theories of reasoned action and planned behaviour in physical activity: Predictive
51 validity and the contribution of additional variables", *Journal of Sport & Exercise
52 Psychology*, Vol. 24, pp. 3-32.
53
54
55
56
57
58
59
60

- 1
2
3 Jackson, D., Gillaspay, J. and Purc-Stephenson, R. (2009), "Reporting practices in
4
5 confirmatory factor analysis: An overview and some recommendations", *Psychological*
6
7 *Methods*, Vol. 14, pp. 6-23.
- 8
9
10 Keihner, A. J., Meigs, R., Sugerman, S., Backman, D., Garbolino, T. and Mitchell, P. (2011),
11
12 "The Power Play! Campaign's school idea & resource kits improve determinants of
13
14 fruit and vegetable intake and physical activity among fourth- and fifth-grade children",
15
16 *Journal of Nutrition Education and Behavior*, Vol. 43 No. 4S2, pp. 122-129.
- 17
18
19 Lamont, M. and Jenkins, J. (2013), "Segmentation of cycling event participants: A two-step
20
21 cluster analysis method utilizing recreation specialisation", *Event Management*, Vol.
22
23 17, pp. 391-407.
- 24
25
26 Levine, E., Olander, C., Lefebvre, C., Cusick, P., Biesiadecki, L. and McGoldrick, D. (2002),
27
28 "The team nutrition pilot study: Lessons learned from implementing a comprehensive
29
30 school-based intervention", *Journal of Nutrition Education and Behaviour*, Vol. 34 No.
31
32 2, pp. 109-116.
- 33
34
35 Malhotra, N. K. (2004), *Marketing Research: An Applied Orientation*, Education Inc., Upper
36
37 Saddle River, NJ.
- 38
39
40 Manning, M. (2009), "The effects of subjective norms on behaviour in the theory of planned
41
42 behaviour: A meta-analysis", *British Journal of Social Psychology*, Vo. 48, pp. 649-
43
44 705.
- 45
46
47 Mcleay, F. and Oglethorpe, D. (2013), "Social marketing, parental purchasing decisions, and
48
49 unhealthy food in developing countries: A Nigerian typology", *Journal of Consumer*
50
51 *Behaviour*, Vol. 12, pp. 232-242.
- 52
53
54 McLernon, D. J., Powell, J. J., Jugdaohsingh, R. and Macdonald, H. M. (2012), "Do lifestyle
55
56 choices explain the effect of alcohol on bone mineral density in women around
57
58
59
60

- 1
2
3 menopause?", *The American Journal of Clinical Nutrition*, Vol. 95 No. 5, pp. 1261-
4
5 1269.
6
7 Mendoza, J., Watson, K., Nguyen, N., Cerin, E., Baranowski, T. and Nicklas, T. (2001),
8
9 "Active commuting to school and association with physical activity and adiposity
10 among US youth", *Journal of Physical Activity & Health*, Vol. 8 No. 4, pp. 488-495.
11
12
13 Merom, D., Tudor-Locke, C., Bauman, A. and Rissel, C. (2006), "Active commuting to
14 school among NSW primary school children: Implications for public health", *Health &*
15
16
17
18
19
20
21 National Social Marketing Centre (NSMC). (2006), "Social marketing benchmark criteria",
22 available at: <http://www.thensmc.com/sites/default/files/benchmark-criteria-090910.pdf>
23 (accessed 30 June 2014).
24
25
26
27 Newton, J., Newton, F.J., Turk, T. and Ewing, M.T. (2013), "Ethical evaluation of audience
28 segmentation in social marketing", *European Journal of Social Marketing*, Vol. 47 No.
29
30
31
32
33 9, pp. 1421-1438.
34
35 Norman, P. and Conner, M. (2006), "The theory of planned behaviour and binge drinking:
36 Assessing the moderating role of past behaviour within the theory of planned
37
38
39
40
41
42
43 Norusis, M. (2007), *SPSS 15.0 Advanced Statistical Companion*, Prentice Hall, Chicago, Ill.
44
45 Okazaki, S. (2007), "Lessons learned from i-mode: What makes consumers click wireless
46 banner ads?", *Computers in Human Behavior*, Vol. 23 No. 3, pp. 1692-1719.
47
48
49
50
51
52
53
54
55
56
57
58
59
60
- Olds, T., Tomkinson, G., Maher, C. and Ferrar, K. (2010), "Trends in the prevalence of
childhood overweight and obesity in Australia between 1985 and 2008", *International
Journal of Obesity*, Vol. 13 No. 1, pp. 57-66.

- 1
2
3 Olds, T., Thomas, S., Lewis, S. and Petkov, J. (2013), "Clustering of attitudes towards
4
5 obesity: A mixed methods study of Australian parents and children", *International*
6
7 *Journal of Behavioral Nutrition and Physical Activity*, Vol. 10, pp. 117-128.
8
9
10 Peattie, K. and Peattie, S. (2009), "Social marketing: A pathway to consumption reduction",
11
12 *Journal of Business Research*, Vol. 62 No. 2, pp. 260-268.
13
14 Perugini, M. and Conner, M. (2000), "Predicting and understanding behavioral volitions: The
15
16 interplay between goals and behaviours", *European Journal of Social Psychology*, Vol.
17
18 30, pp. 705-731.
19
20
21 Raval, D. and Subramanian, B. (2004), "Cultural values-driven segmentation in social
22
23 marketing", *Journal of Nonprofit & Public Sector Marketing*, Vol. 12 No. 2, pp. 73-85.
24
25 Reilly, J., Methven, E., McDowell, Z., Hacking, B., Alexander, D., Stewart, L. and Kelnar, C.
26
27 (2003), "Health consequences of obesity", *Archives of Disease in Childhood*, Vol. 88,
28
29 pp. 448-752.
30
31
32 Rhodes, R. E. and Courneya, K. S. (2003), "Investigating multiple components of attitude,
33
34 subjective norm, and perceived control: An examination of the theory of planned
35
36 behaviour in the exercise domain", *The British Journal of Social Psychology*, Vol. 42,
37
38 pp. 129-146.
39
40
41 Rimal, R., Brown, J., Mkandawire, G., Folda, L., Bose, K. and Creel, A. (2009), "Audience
42
43 segmentation as a social-marketing tool in health promotion: Use of the risk perception
44
45 attitude framework in HIV prevention in Malawi", *American Journal of Public Health*,
46
47 Vol. 99 No. 12, pp. 2224-2229.
48
49
50 Rodriguez, A. and Vogt, C. A. (2009), "Demographic, environmental, access and attitude
51
52 factors that influence walking to school by elementary school-aged children", *Journal*
53
54 *of School Health*, Vol. 79 No. 6, pp. 255-261.
55
56
57
58
59
60

- 1
2
3 Rosenberg, D., Sallis, J., Conway, T., Cain, K. and McKenzie, T. (2006). Active
4
5 transportation to school over 2 years in relation to weight status and physical activity.
6
7 *Obesity*, Vo. 14 No. 10, pp. 1771-1776.
8
9
10 Rundle-Thiele, S., Russell-Bennett, R., Leo, C. and Dietrich, T. (2013), “Moderating teen
11
12 drinking: combining social marketing and education”, *Health Education*, Vol. 113.5,
13
14 pp. 392-406.
15
16 Salmon, J., Timperio, A., Cleland, V. and Venn, A. (2005), “Trends in children’s physical
17
18 activity and weight status in high and low socio-economic areas of Melbourne,
19
20 Victoria”, *Australian and New Zealand Journal of Public Health*, Vol. 29 No. 4, pp.
21
22 337-341.
23
24
25 Scott, E. J., Eves, F. F., French, D. P. and Hoppé, R. (2007), “The theory of planned
26
27 behaviour predicts self-reports of walking, but does not predict step count”, *British*
28
29 *Journal of Health Psychology*, Vol. 12, pp. 601-620.
30
31
32 Spallek, M., Turner, C., Spinks, A., Bain, C. and McClure, R. (2006), “Walking to school:
33
34 Distribution by age, sex and socio-economic status”, *Health Promotion Journal of*
35
36 *Australia*, Vol. 17, pp. 134-138.
37
38
39 Taylor, S., Bagozzi, R. and Gaither, C. (2005), “Decision making and effort in the self-
40
41 regulation of hypertension: Testing two competing theories”, *British Journal of Health*
42
43 *Psychology*, Vol. 10, pp. 505-530.
44
45
46 Timperio, A., Crawford, D., Telford, A. and Salmon, J. (2004), “Perceptions about the local
47
48 neighbourhood and walking and cycling among children”, *Preventative Medicine*, Vol.
49
50 38, pp. 39-47.
51
52 van der Ploeg, H. P., Merom, D., Corpuz, G. and Bauman, A. E. (2008), “Trends in
53
54 Australian children travelling to school 1971-2003: Burning petrol or carbohydrates?”,
55
56 *Preventative Medicine*, Vol. 46, pp. 60-62.
57
58
59
60

1
2
3 Walsh, G., Hassan, L. M., Shiu, E., Andrews, J. C. and Hastings, G. (2010), "Segmentation in
4
5 social marketing: Insights from the European Union's multi-country, anti-smoking
6
7 campaign", *European Journal of Marketing*, Vol. 4 No. 7/8, pp. 1140-1164.
8

9
10 Wang, Y. and Lim, H. (2012), "The global childhood obesity epidemic and the association
11
12 between socio-economic status and childhood obesity", *International Review of*
13
14 *Psychiatry*, Vol. 24 No. 3, pp. 176-188.
15

16 World Health Organisation (WHO). (2014), "Childhood overweight and obesity", available
17
18 at <http://www.who.int/dietphysicalactivity/childhood/en/> (accessed 30 June 2014).
19

20
21 Yeung, J., Wearing, S. and Hills, A. (2008), "Child transport practices and perceived barriers
22
23 in active commuting to school", *Transportation Research*, Vol. 42, pp. 895-900.
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Table 1 Assessment of the TPB constructs' reliability and validity

Latent factors	α	CR	AVE	1	2	3	4
1. Instrumental Attitude	.968	.969	.912				
2. Affective Attitude	.939	.942	.844	.613			
3. Perceived Behavioural Control	.809	.824	.613	.025	.024		
4. Subjective Norms	.883	.887	.724	.059	.051	.084	
5. Intention	.995	.996	.987	.002	.010	.084	.158

Note. α = Cronbach's Alpha coefficient; CR = composite reliability coefficient; AVE = average variance extracted.

For Peer Review

Table 2. Profile of market segments identified by two-step cluster analysis

Segmentation Variable	Importance	Long-distance Non-Walkers	Middle-distance Sporadic Walkers	Short-distance Frequent Walkers	Sig.
		n = 138 (33.0%)	n = 122 (29.2%)	n = 158 (37.8%)	
Approximate Distance	1.00	5km or more (62.3%)	1km – less than 2km (54.9%)	Less than 1km (64.6%)	.000**
Walking Behaviour	0.84	0.4 (1.5)	2.7 (3.3)	7.0 (3.6)	.000**
Subjective Norms	0.53	3.1 (1.6)	4.5 (1.6)	5.7 (1.2)	.000**
Intention	0.23	1.9 (1.6)	3.9 (2.2)	3.8 (2.2)	.000**
Employment Status	0.18	Employed (81.2%)	Home duties (55.7%)	Employed (73.4%)	.000*
Perceived Behavioural Control	0.18	4.4 (2.2)	5.7 (1.4)	5.9 (1.3)	.000**
Instrumental Attitude	0.14	5.7 (1.7)	5.5 (2.0)	6.7 (1.0)	.000**
Age of the child	0.13	7 years old (21.0%)	6 years old (35.2%)	7 years old (20.3)	.000**
Caregiver age	0.13	40 to 44 years old (31.2%)	30 to 34 years old (32.8%)	40 to 44 years old (36.7%)	.000**
Affective attitude	0.13	5.5 (1.4)	5.2 (1.7)	6.2 (0.9)	.000**
No. of cars	0.09	2 (74.6%)	2 (50.0%)	2 (53.2%)	.000**
Income	0.09	\$120 000 and over (24.6%)	\$40 000 – less than \$60 000 (23.0%)	\$120 000 and over (24.1%)	.000**
No. of children	0.09	1 (57.2%)	1 (77.0%)	2 (49.4%)	.000**
Education	0.01	Trade certificate or diploma (33.3%)	Trade certificate or diploma (36.9%)	Trade certificate or diploma (28.5%)	.089

Note. ** p <.001