

Relationship of Self-efficacy, Encouragement, and Neighbourhood Influence to the  
Physical Activity of Emerging Adults

Michael A. McCabe.

Supervised by Dr. Patricia Frazer.

Head of Department: Dr. Sinead Eccles.

Submitted in partial fulfilment of the requirements of the Bachelor of Arts degree  
[Psychology Specialisation] at DBS School of Arts, Dublin.

April 2013

Department of psychology

DBS School of Arts

## Table of Contents:

	Page
Acknowledgements	3
Abstract	4
Introduction	5
Hypotheses	14
Methodology	15
Results	21
Discussion	29
References	42
Appendix	54

## Acknowledgements

I would like to express my gratitude to Dr. Patricia Frazer for her support and generous professional guidance throughout this project.

This project would not have been possible without the care and encouragement of Dr. Noel Kennedy.

I would also like to thank DBS, School of Arts, for their patience in what has been a long endeavour.

## Abstract

An understanding of the moderators that shape physical activity behaviour during emerging adulthood and how they apply differently to men and women is necessary to prevent adult obesity. A correlational design was used to deliver a cross-sectional survey with measures of self-efficacy, encouragement, neighbourhood influence, age, and gender to 181 emerging adults. The model predicted 25% of the variance in physical activity with self-efficacy ( $\beta = .379$ ) and encouragement ( $\beta = .244$ ) being the strongest predictors. Whereas men and women had different patterns of self-efficacy and physical activity, gender did not predict physical activity. This study suggests that multilevel interventions designed specifically for emerging adults to provide continuity between adolescent and adult physical activity should consider the influences of modifiable psychosocial factors.

Improvements in diet, sanitation and medicine over the past century have corresponded to worldwide improvement in health and life expectancy. Today, the non-communicable or lifestyle diseases: cardiovascular disease, cancer, diabetes, and chronic respiratory disease, account for 63% of all deaths globally (World Health Organisation 2011). Obesity is the major pathway between physical inactivity and non-communicable disease (De Vet, De Ridder, & De Wit, 2011). The United States Centres for Disease Control (CDC) report that the only factor related to obesity that has significantly changed in the last twenty years is that participation in regular physical activity has decreased (CDC, 2010). Obesity is a public health concern in Ireland where 38% of people are overweight and another 23% are obese (Health Services Executive, 2009). Current evidence is that risk factors associated with lifestyle diseases are established early in life and continue to track throughout the life-span (Thompson, Jago, Brockman, Cartwright, & Fox, 2009). Emerging adulthood, which spans the transition from adolescence to adulthood, is gaining recognition as a critical period for establishing lasting healthful behaviour (Nelson, Story, Larson, Neumark-Sztainer, & Lytle, 2008). The major challenge facing health professionals, policymakers, and researchers is to initiate and sustain behaviour change in physical activity to reverse global obesity trends. Initiative to instil healthful behaviour is required that target attitudes and perceptions as well as establishing community partnerships to facilitate active lifestyles (De Bourdeaudhuij, et al., 2011; Fernstrom, Reid, Rahavi, & Doohar, 2012).

### *Physical Activity*

Physical activity is not only exercise but any activity which involves body movements that are part of playing, working, active transportation, house work, and other recreation (HSE, 2009). As well as burning calories exercise can benefit brain functions like learning and memory (Chaput, et al., 2011). Being physically active can protect against

mental illness (Downs & Ashton, 2011) and neurodegenerative disease in later life (Middleton, Barnes, Lui, & Yaffe, 2010). A 10 year longitudinal study in the Netherlands, (N=12,405), found that adults who adopted an active lifestyle reported better physical functioning, vitality, and general health than did inactive adults or adults that became inactive (Van Oostrom, et al., 2012). As only 41% of Irish adults take part in regular physical activity the national guide on physical activity (Get-Ireland-Active) aims to promote physical activity for everyone (HSE, 2009). This program divides the population into to three age groups: up to 18 years, 18 to 65 years, and over 65 years, and gives physical activity advice for each group. For the under 18s it recommends 60 minutes of vigorous activity every day, however, for 18 to 65 year olds the recommendation drops to 30 minutes of moderate to vigorous activity on 5 days of the week. This represents a decrease in energy expenditure from 4,160 metabolic units per week to less than 1,200 units per week over the transition to adulthood. Given the long-term benefits of physical activity a large reduction during this critical period ought to be a cause for concern (El Ansari, et al., 2011) Though once considered a period of health and well-being the transition from adolescence to adulthood is now associated with an increasing incidence of obesity (Scharoun-Lee, Adair, Kaufman, & Gordon-Larsen, 2009). In their study of physical activity across the life-span Keegan, Biddle, and Lavalee (2010) point out that as physical ability reaches its peak during early adulthood physical activity begins to decline. In this key period physical activity is necessary for preventing weight gain and is essential to any plan for losing weight (Chaput, et al., 2011; Wichstrøm, Von Soest, & Kvaalem, 2012). Increased body weight in first-year university students has been specifically linked to reduced physical activity and not related to increased dietary intake (Jung, Bray, & Martin-Ginis, 2008). Physical activity that takes place in everyday settings needs to be studied as a developmental process that varies over time in order to provide practical and accurate measures of the individual as well as the socio-

environmental determinants of this important behaviour (Chaumeton, Duncan, Duncan, & Strycker, 2011).

### *Emerging Adulthood and Physical Activity*

The period between the ages of 18 and 25 years is marked by many important transitions; Arnett (2000) proposes this period as a unique developmental stage. In the latter half of the twentieth century population level demographic changes have seen the transition into adulthood prolonged by formal education and the postponement of traditional relationship and employment roles (Nelson, et al., 2008). During this time individuals are often separated from their family and the neighbourhood where they grew up and have, perhaps for the first time, to make independent choices that shape their future identity. Many of the lifestyle choices that are made at this time involve health risk behaviours such as experimentation with drugs, alcohol, and sexual activities. Emerging adulthood is also marked by a decline in both the intensity and frequency of physical activity for males and females (Boreham, et al., 2004; Zimmerman-Sloutkis, Wanner, Zimmerman, & Martin, 2010). The opportunity to promote physical activity during emerging adulthood may be overlooked when this group is included with older adults. Few physical activity programs are designed for emerging adults and there is concern that standard behavioural programs do not meet their needs. (Gokee-LaRose, et al. 2009). Recent research has found that emerging adults achieve poorer results in behavioural weight loss programs than older adults (Gokee-LaRose, Leahey, Weinberg, Kumar, & Wing, 2012). Few studies have been published that investigate physical activity during emerging adulthood. Bell & Lee (2005) whose research with Australian women found patterns of reduced physical activity which they say highlight a need for interventions to encourage continued physical activity during emerging adulthood. Using diary studies of physical activity Maher, et al. (2012) discovered a robust positive

association between daily physical activity and satisfaction with life in two samples of emerging adults. Understanding how the transitions of emerging adulthood are related to physical activity may be important to promoting lifetime physical activity (Nelson, et al., 2008).

### *Social Ecology and Physical Activity*

Social ecology provides a multi-level framework by which the contributions of different theories of behaviour can be combined to explain how individual, social, and environmental features interact in the context of people's lives. Social-ecological frameworks based on Bronfenbrenner's (1977) ecological systems theory have been useful in designing other multivariate research in the physical activity domain; the model is shown in Figure 1 (Bopp, et al., 2006; Duncan, Duncan, Strycker, & Chaumeton, 2004; Eyler, et al., 2002; Pan, et al., 2009; Sallis, et al., 2006) Bronfenbrenner (1977) noted that similar ecological processes often produce different developmental outcomes for males and females. A systematic review of qualitative studies showed that environmental barriers to physical activity such as lack of facilities and lack of neighbourhood safety were reported by all adolescent participants. The interpersonal barriers most frequently reported were lack of peer and family support. Individual level barriers experienced by all adolescents were lack of self-efficacy and lack of perceived athletic ability (Stankov, Olds, & Cargo, 2012). Despite the recognised potential of the social ecological model few studies have applied it to the physical activities of emerging adults (Duncan, et al., 2004). In applying an ecological framework to physical activity in emerging adulthood it is hoped that the multilevel influences of individual, social, and neighbourhood elements on physical activity can be explored.

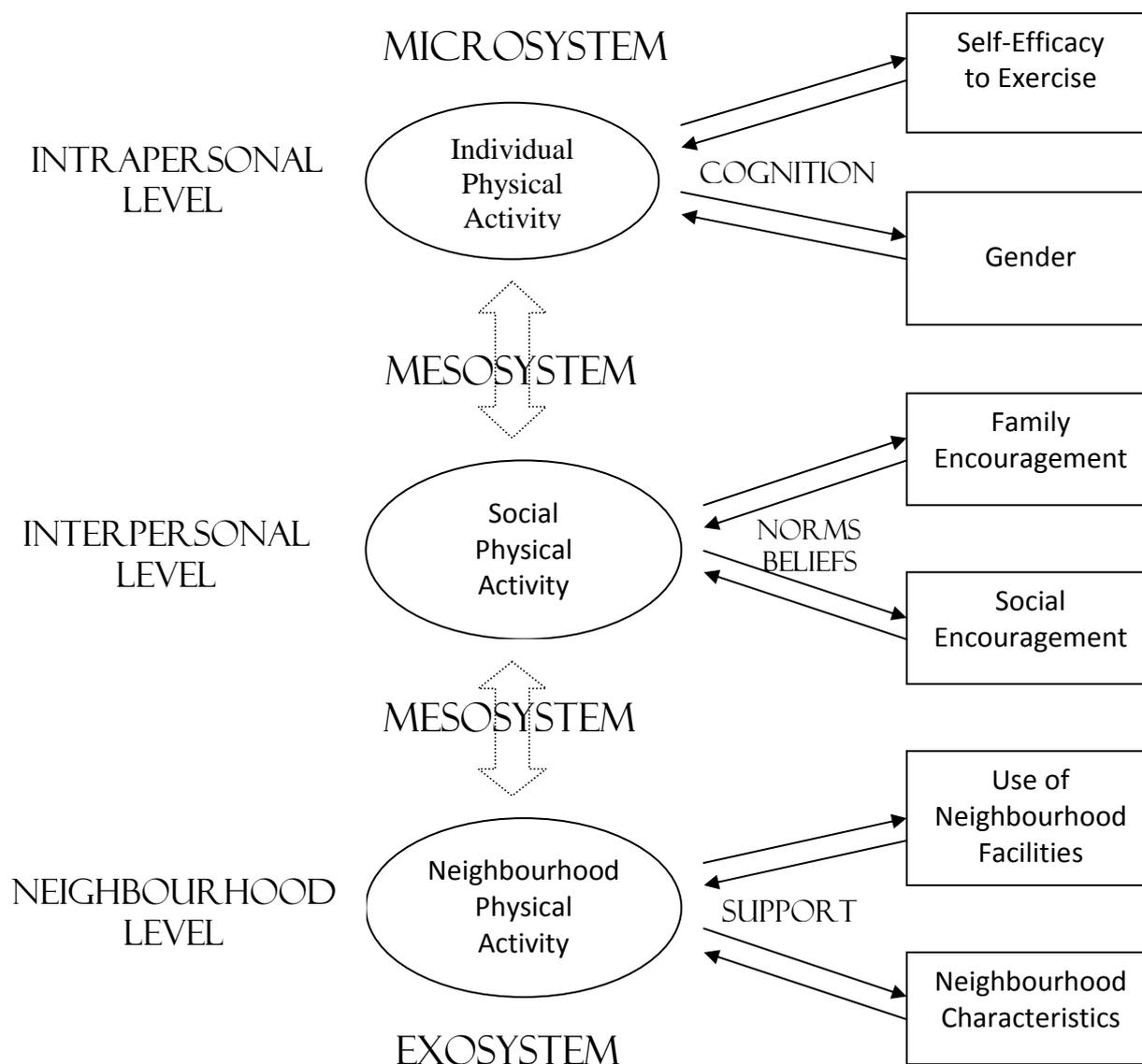


Figure 1. A multi-level social ecology model used as a framework for the current research.

(Adapted from: Duncan, et al., 2004).

### *Self-Efficacy and Physical Activity*

According to social-cognitive theory (Bandura, 2006) self-efficacy is concerned with an individual's judgement of their capability to execute particular types of performances; self-efficacy perceptions can be derived from past performances, vicarious experiences, and psychological state. Self-efficacy affects human functioning by influencing whether people

are optimistic or pessimistic about their abilities, their hardiness in the face of adversity and the degree to which coping with obstacles causes them stress and depression. A key concept of self-determination theory (Ryan & Deci, 2004) is that basic psychological needs for competence, autonomy, and relatedness define the contextual factors that support or undermine motivation, performance, and well-being. Research has indicated that declines in physical activity during the transition to adulthood could be due to declines in self-regulatory beliefs (Ulrich-French, Cox, & Bumpus, 2012). Using both self-report measures and accelerometer-assessment a study of 1,200 Belgian adults (20 to 65 years) revealed exercise self-efficacy as the strongest individual correlate of physical activity (Van Dyck, et al., 2011). Self-efficacy is dynamic in nature; therefore its measurement needs to be specific to each activity and for each population (Bandura, 2006). For many people the years between 18 and 25 are the most volitional of the lifespan when people's evaluation of their well-being appears to worsen (Maher et al., 2012).

### *Encouragement and Physical Activity*

Perceived competency for physical activity is related to actual competency but can be influenced by social encouragement (Jose, Blizzard, Dwyer, McKercher, & Venn, 2011). Encouragement is thought to have a longer lasting effect on behaviour change through its influence on self-efficacy (Hoepa, Scragg, Schofield, Kolt, & Schaaf, 2007). The supportive role of family and friends has consistently been related to high levels of physical activity among youth (Duncan, Duncan, & Strycker 2005). According to the theory of planned behaviour, subjective norms arise from a person's belief about the extent to which important others value their performance of a particular behaviour (Ajzen, 2002). Strong social support reinforces the intention to perform the behaviour. Van Dyck, et al. (2011) found social support from family and friends a strong predictor of physical activity along with self-

efficacy. However, in their Canadian research Pan, et al. (2009) found that social support was not significantly related to physical activity in any age group. A study with 325 student nurses and 1,452 employees in the British health service concluded that compared to interventions that instilled knowledge of physical activity, interventions that increase an individual's social support and remove barriers to physical activity were more effective in increasing physical activity among health-care workers (Mo, Blake, & Batt, 2011). Social support may have a significant influence on physical activity behaviours during emerging adulthood; this is a time of changing support systems and shifting interpersonal influences. Individuals at this stage of their life may not consider physical activity to be important and extra encouragement by family and friends may be necessary (Ullrich-French, et al., 2012). In consideration of the changes in social relationships during emerging adulthood this study will measure perceived encouragement from extended family members, friends, and people at college or the workplace.

### *Neighbourhood Influence and Physical Activity*

Neighbourhood influences of any kind are rarely included in research into the physical activity of young people even though they represent an important part of the ecological framework (Duncan, et al., 2004). Human behaviours depend on specific places and physical activity is especially place-dependent. (Sallis, 2009). Supports and barriers in the environment can directly affect the ability to translate self-efficacious beliefs and social encouragement into actual behaviour. Neighbourhoods that are conducive to physical activity will typically have more people participating in activity leading to perceptions of social desirability and activity-related social norms (Schüz, et al., 2012). However, during emerging adulthood factors such as full-time employment, continued education, and lack of financial independence can have an impact on access to and use of neighbourhood facilities. Whereas

adults can pick a neighbourhood to match their lifestyle (McCormack & Shiel, 2011) emerging adults may have little choice about where they live. While more than 50% of 18- to 25-year olds live with their family many of these will have had some time away from home attending college or travelling (Kloep & Hendry, 2010). Analysis of Behavioural Risk Factor Surveillance System (BRFSS) data for a random sample of Texas adults aged 18 to 64 years, (N=6,317), found that perceived neighbourhood characteristics and use of neighbourhood facilities were positively related to meeting recommendations for physical activity (Velasquez, et al., 2009). Following a review of 47 studies into the environmental determinants of physical activity in adults Wendel-Vos, Droomers, Kremers, Brug, & Van Lenthe, (2007) conclude that environmental factors moderate the influence self-efficacy and social support on all physical activity. Arnett (2000) believes that the years of emerging adulthood are, for most people in industrialised societies, unstructured and unsettled having relatively high levels of domestic and residential instability.

### *Gender and Physical Activity*

Peer-reviewed research into physical activity with adolescents and adults has consistently reported different patterns of physical activity for females and males (Dowda, Ainsworth, Addy, Saunders, & Riner, 2003; Eyler, et al., 2002). Researchers agree that the variance in performance of physical behaviours between males and females is not sufficiently explained by biology (Shifren, Furnham, & Bauserman 2003). There are specific concerns over physical activity in women because of their lower rates of physical activity during all life stages ( El Ansari, et al., 2011; Bell & Lee, 2005). The social ecological model can take into account how individual, societal and neighbourhood factors can interact to limit female participation in physical activity (Eyler, et al., 2002; Sallis, Prochaska, & Taylor, 2000). Exercise self-efficacy has been found to be a necessary cognition for postnatal women when

initiating, resuming or maintaining physical activity (Cramp & Bray, 2011). However, Pan, et al. (2009) found exercise self-efficacy to be higher in men. While self-determination theory posits the same underlying psychological needs for males and females it accepts that societal influences can bring about specific motivations to exercise for each gender (Frederick-Recasacino, 2004). Social support is a more important determinant of regular physical activity for women than for men; overall females report getting more encouragement to exercise from their friends and peers than males (Gruber, 2008; Molloy, Dixon, Hamer, & Sniehotta., 2010). Associations between positive perceptions of neighbourhood characteristics and use of facilities were stronger for women than men in a study of Texas adults (Velasquez, Holahan, & You., 2009), and in university students (Reed & Ainsworth, 2007). The transitions of emerging adulthood in the major life domains of residence, employment, relationships, and parenthood may have particular difficulties for young women which in turn may affect physical activity patterns (Bell & Lee 2005).

### *Research Objectives*

A prerequisite to designing and implementing effective physical activity programs is to understand the factors that influence some individuals to adopt an active lifestyle. In recognition of developmental considerations and the documented decline in physical activity it is important to treat emerging adults as a distinct group. Using an ecological model as a framework for the research four correlates of physical activity were selected to represent interactions between individuals and environments. The aim of this research is to determine if self-efficacy for physical activity, encouragement for physical activity, gender, and neighbourhood influence on physical activity can be used to predict physical activity for males and females during emerging adulthood. The strength of this relationship will be an indication of how changes in the predictor variables should influence physical activity. This

study will compliment the current literature on the determinants of physical activity as they develop throughout the lifespan. Given that physical activity behaviour represents a significant contribution to physical and mental health and that many of the factors that influence an individual to adopt an active lifestyle can be modified this research may contribute useful information to interventions that reverse the decline in physical activity that is characteristic of emerging adulthood.

### Hypotheses

It is hypothesised that self-efficacy for physical activity, encouragement for physical activity, neighbourhood influence on physical activity, and gender will significantly predict physical activity for emerging adults.

It is hypothesised that emerging adult men will report greater physical activity and self-efficacy for physical activity than emerging adult women.

It is hypothesised that emerging adult women will report greater encouragement for physical activity and neighbourhood influence on physical activity than emerging adult men.

## Methodology

### *Participants*

The target population for this project were men and women between 18- and 25-years of age. The accessible population was the students at Dublin Business School and individuals from the researcher's neighbourhood. Initial contact with the student participants was made by asking lecturers, using college e-mail, for their permission to approach students at the beginning of their lectures. All lecturers that were contacted gave their consent to the research, with the proviso that each student's participation was to be voluntary. Using the snowball technique others of the eligible age group were recruited from the researcher's neighbourhood. A sample of 188 participants agreed to take part in the study: 94 females having a median age of 21 years, (quartile range 20-23 years, SD=1.8), and 87 males having a median age of 21 years, (quartile range 20-23 years, SD=1.9).

### *Design*

A multilevel social-ecological model of health behaviour as displayed in Figure 1 was used as a framework in designing the study (Sallis, 2009)

This study followed a correlational design with a cross-sectional quantitative survey used to measure physical activity as the continuous criterion variable and self-efficacy for physical activity, social encouragement for physical activity, gender, and neighbourhood influence on physical activity as predictor variables. Participant's age was the only inclusion criterion.

### *Materials*

A survey questionnaire was compiled that included the following instruments to measure the criterion and predictor variables. The full questionnaire and explanatory cover sheet are reproduced in the Appendix.

Physical activity (PA) was measured using the short form version of the International Physical Activity Questionnaire (IPAQ, 2002). An assessment of the reliability and validity of the IPAQ questionnaires using data from 14 centres in 12 countries study found the IPAQ to have good reliability (Spearman's  $\rho \approx 0.8$ ) and moderate criterion validity ( $\rho \approx 0.3$ ) when used to measure population levels of PA among 18- to 65-yr-old adults (Craig, et al., 2003). The IPAQ, in its pen and paper format, combines PA components that are part of leisure time activity, domestic activity, work-related activity, and transport-related activity. Participants are asked to consider the number of days in the last 7 days that they did vigorous-intensity physical activity, moderate-intensity physical activity, and walking while engaged in any of the four domains. They are also asked to record the number of hours and minutes per day they did each of the three activities. Using the energy expenditure per minute of a 60 kilogram person while resting as the unitary metabolic rate (MET). MET equivalents for the three activity levels are calculated by multiplying the minutes per week by the factor 8.0 for vigorous activity, 4.0 for moderate activity, and 3.3 for walking. Only values of 10 or more minutes per day are included in the calculation of summary scores. The rationale behind this is that at least 10 minutes of any activity is required for health benefits; it is recommended that responses of less than 10 minutes are recoded as zero. A maximum value of 960 minutes (16 hours) is applied to the sum of all walking, moderate, and vigorous times; values above this are considered unreasonably high and should be excluded. Total MET minutes per week for each respondent is found by summing all three. The IPAQ includes an additional indicator variable of hours spent sitting per day; this measure is not included in the summary score for physical activity and is reported separately as median values. Data for total physical activity collected with IPAQ can be reported as a continuous measure; however, energy expenditure is non-normally distributed in many populations (IPAQ, 2002). The IPAQ is an effective measure of general activity as it includes all types of energy expenditure and is

appropriate determining whether individuals meet public health guidelines for regular physical activity (Dishman, Vandenberg, Motl, & Nigg, 2010).

Self-efficacy was measured using the Self-Efficacy to Regulate Exercise scale (Bandura, 2006). Hypothesis testing using multiple regression has shown this scale to have high reliability ( $R^2$  from 0.38 to 0.76);  $\alpha = 0.92$  and good validity in predicting exercise activity ( $F=78.8$ ;  $p<0.05$ ) using a 15:1 participant to variable ratio (Resnick & Jenkins, 2000). The measure describes 18 situations that can make it hard to be physically active on a regular basis. Situations include physical, social and self-evaluative barriers such as; when I am feeling tired, without support from my family or friends, during bad weather, and when I am feeling under pressure from work. Participants are asked to rate their confidence that they can perform exercise regularly in each situation. They are instructed to record their degree of confidence beside each item based on a given scale ranging from 0 (cannot do at all) to 100 (highly certain can do). Self-efficacy for physical activity is calculated by summing the responses for each situation; total scores can range from a minimum of 0 to a maximum of 1800.

Social encouragement for physical activity was assessed using measures devised by Trost, et al. (2003) to test a conceptual model of parental support for physical activity. The scale was expanded by Hoepa, et al. (2007) to include encouragement from other family members, friends, and college/workmates. In evaluation this scale was found to have internal consistency as measured by Cronbach alpha of 0.78; with 1 week test-retest reliability of  $R=0.81$  (Trost, et al., 2003). Perceived encouragement from the participant's mother, father, brothers/male cousins, sister/female cousins, friends, and people at college/workplace is recorded using the format "How much do your [encouragement source] encourage you to be physically active or play sports?" Participants responded using a 5-point scale: a lot, some, a little, not at all, don't have/live with [encouragement source] and scored as: a lot=5... don't

have=1; giving a scoring range from 6 to 30 for each participant. Due to the possibility of collinearity between certain support sources responses for all six items are combined into a single variable (Hoepa, et al., 2007).

Neighbourhood influence on physical activity was measured with The Environmental Supports for Physical activity Questionnaire (Sip 4-99 Research Group, 2002). This measure is the neighbourhood module of the United States' Centers for Disease Control and Prevention's Behavioural Risk Factor Surveillance System (BRFSS). The questionnaire contains 11 items which are considered an accurate and reliable measure of an individual's perceptions of the environment, with moderate validity ( $\kappa = 0.02$  to  $0.370$  and reliability ( $\alpha = 0.42$  to  $0.47$ ) when used in population samples of noninstitutionalised adults aged 18 years and over (Kirtland, et al., 2003). Composite scoring of the total of all 11 items is also reported to have moderate ( $\alpha = 0.63$ ) reliability (Bopp, et al., 2006). Participants are asked to rate the extent to which their neighbours are active; their neighbourhood is pleasant, safe, and well lighted. Participants are also asked about their use of facilities in their neighbourhood for physical activity. Facilities include public or private recreation facilities, schools, walking trails, parks, playgrounds, and shopping centres. Response options ranged from very good [neighbourhood characteristic/use of facility] to don't know/not sure. Responses were scored: very good = 5... don't know =1 giving a possible range of scores from 11 to 55 for each respondent.

The first section of the questionnaire contained the seven questions that make up the IPAQ, the other three measures were compiled into the second part of the questionnaire which had 35 separate items. Participants were finally asked to record their age in years at last birthday and their sex.

### *Procedure*

The proposed research was approved by the Department of Psychology, Dublin Business School.

The Dublin Business School full-time timetable was used to identify lectures that have relatively large attendances. Full-time lectures were selected because the researcher is a part-time student and therefore would not know any of the people who responded to the survey.

The relevant lecturers were then sent the following message by college e-mail:

“As a part-time psychology student at DBS I am doing my final year research project. The aim of the research is to explore factors influencing physical activity in 18 to 25 year olds. I am writing to ask if you would permit me to give out questionnaires to the students at one of your full-time lectures. The questionnaire can be completed in less than six minutes. My project has been approved by the psychology department and DBS ethics review board.  
Best Wishes,  
Michael McCabe. S/No: 1066066.”

All lecturers that were contacted agreed to the request and appointments were made to visit 5 lectures on Monday 11<sup>th</sup> and 5 on Tuesday 12<sup>th</sup> of December 2012. Data collection took place at the beginning of each lecture preceded by a short introduction describing the purpose of the survey. Students were informed that the questionnaires applied to people over 18 years of age and less than 26, they were asked to read the cover sheet carefully (Appendix) and reassured that they did not have to participate if they did not want to. Questionnaires were distributed and after reading the description of the study in the covering sheet students who choose to participate completed the questionnaires and their responses were collected without incident. The survey was completed and lectures returned to normal in under 15 minutes in all cases. As a token appreciation all students and their lecturer were offered some sweets by the researcher before leaving the room. Other participants were recruited by the snowball technique from the researcher’s neighbourhood. People in the applicable age group were asked to distribute questionnaires among their friends and given an envelope to return their responses together to protect individual identity.

*Ethical considerations*

Ethical approval for this research was obtained from the Dublin Business School ethics review board. Research was conducted in accordance with Dublin Business School's ethical guidelines for research with human participants.

## Results.

SPSS version 18 was used for all statistical procedures. In total 188 individuals responded to the survey. When the questionnaires were checked 7 were excluded; it was found that 2 respondents did not record their gender, another 2 male and 3 female respondents did not state their age. A total of 181 complete questionnaires were analysed.

Table 1. Descriptive data and variable scores for males and females

Variable	Male (n=87) % or Mean (SD)	Female (n=94) % or Mean (SD)
Age	21.94 (1.94)	21.60 (1.80)
Sex	48%	52%
PA in MET/week	3317.8 (2060.0)	2578.4 (1913.1)
PA >1200MET/week <sup>1</sup>	89%	80%
PA >4160 MET/week <sup>2</sup>	28%	20%
Walking: % of total PA Minutes/week	50% 409(292)	64% 418(290)
Moderate: % of total PA Minutes/week	17% 166(250)	14% 120(200)
Vigorous: % total PA Minutes/week	33% 160(178)	22% 90(128)
Self-efficacy for PA	933(220)	791(288)
Encouragement for PA	19(4.5)	18(4.7)
Neighbourhood influence on PA	39(4.9)	38(5.1)
Median hours sitting/day (quartile range)	6(5-8)	8(6-9)

Note: PA = physical activity; MET = Metabolic equivalent units.

<sup>1</sup> Recommended weekly physical activity in MET for a person over 18 years (HSE, 2009)

<sup>2</sup> Recommended weekly physical activity in MET for a person under 18 years (HSE 2009)

The sample was made up of 94 females (52%) and 87 males (48%). Table 1 shows their descriptive data and their scores on the variables for each gender. Table 2 shows the central tendency and spread of the scores for the whole sample on each of the continuous variables. Independent t-tests were performed to check the significance of any differences identified by descriptive analysis. Males reported more weekly physical activity (Mean = 3317.8, SE = 220.8) than females (Mean = 2578.4, SE = 197.3); the difference was significant  $t(179) = 2.741$ ,  $p(1 \text{ tailed}) = .0035$ , this represents a small effect size; given by Field's (2009, p.332) formula as:  $r = \sqrt{t^2 / (t^2 + df)}$ :  $r = .20$ .

Table 2 Central tendency and spread of scores on measured continuous variables

(n = 181)	Mean (SD)	Median	Range	Quartile Range
PA in MET/ Week	2934 (2014)	2526	9762	272
Self-efficacy for PA	860 (267)	870	1470	350
Encouragement for PA	19 (5)	19	21	6
Neighbourhood influence on PA	39 (5)	39	24	8

Note: PA = Physical activity; MET = Metabolic equivalent units

A bar chart of the three levels of PA as they contribute to the weekly totals of energy expenditure is displayed in figure 2. Mean minutes per week of walking and moderate activity were not significantly different for males and females. Males reported spending more minutes per week in vigorous activity (Mean = 161, SE = 19), than their female counterparts (Mean = 91, SE = 13); the difference was significant  $t(179) = 2.935$ ,  $p(1 \text{ tailed}) = .002$ , effect size;  $r = .22$ . Total values show that 89% of males and 80% of females expended more than 1200 MET per week; the recommended minimum for adults over 18, while 28% of

males and 20% of females achieved the recommended energy expenditure for people who are under 18 years

On average male scores on self-efficacy were higher (Mean = 933, SE = 23.6) than female (Mean = 792, SE = 29.7). This difference was significant  $t(179) = 3.684, p < .001$ , effect size:  $r = .27$ . Male and female scores for encouragement for PA and neighbourhood influence on PA were found to be not significantly different.

Fifty percent of the male sample spent between 5 and 8 hours per day sitting while their female counterparts sat for between 6 and 9 hours per day.

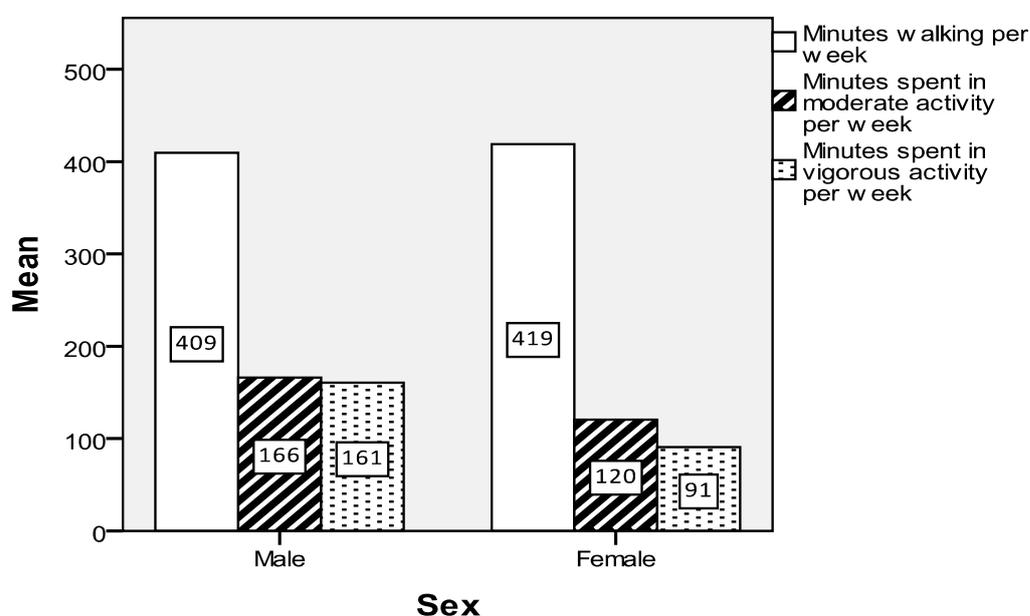


Figure 2 Weekly PA in mean minutes by type for males and females

Data screening revealed the distribution of all variables to be approximately normal with the exception of physical activity which had positive skew (1.141) and was leptokurtic (1.071) with Shapiro-Wilk significantly different from normal. Physical activity scores were logarithmically transformed as recommended by Tabachnick and Fidell (2001). Normality tests after transformation showed skew =  $-0.475$  and kurtosis =  $-0.124$ , with Shapiro-Wilk

not significantly different from normal at  $df (181)$ ,  $Sig. >0.05$  Table 3 details the results of Levine tests carried out on the data as entered into multivariate analysis. The four continuous variables are not significantly different from the homogeneity of variance assumption. There were no outliers  $> 3 \times SD$  on any of the variables and no multivariate outliers so data from all complete questionnaires was included in the analysis.

Table 3 Homogeneity of variance values for continuous variables used in this study

	Levine Statistic Based on Mean (df: 1, 179)	Sig.
PA Log transformed	2.334	.128
Self-efficacy for PA	2.518	.114
Encouragement for PA	0.227	.634
Neighbourhood influence on PA	0.398	.529

Note: PA = Physical Activity

Table 4 shows the results of multiple linear regression analysis that was used to determine the predictive utility of the model that had log transformed physical activity as the criterion (dependent) variable and self-efficacy for PA, encouragement for PA, gender, and neighbourhood influence on PA as the predictor (independent) variables. The model as a whole accounts for 25.2% of the variability in physical activity for the sample and 23.5% of the variability in physical activity if generalised to the population. The cross validity of the model is supported by this small shrinkage value (0.017). ANOVA value at 14.798 indicates that multiple R is significantly different from zero.

Table 4 Regression model summary

R	R <sup>2</sup>	Adjusted R <sup>2</sup>	ANOVA	Sig. (F)	Durbin-Watson
.502	.252	.235	F=14.798	.000	2.089
Dependent Variable: Physical activity Log transformed					
Predictors: Self-efficacy for physical activity; Encouragement for physical activity; Neighbourhood influence on physical activity; Gender.					

Correlations obtained from the regression analysis are shown in Table 5 with Figure 3 displaying scatterplots obtained for continuous predictor variables that had significant correlation with the criterion variable. Correlations produced by the multivariate analysis indicate a positive relationship between physical activity and the predictor variables and positive correlations between predictor variables. Point Biserial correlations obtained for descriptive purposes between gender and the continuous variables had the same values as those produced by the regression analysis.

Table 5 Correlations between variables used in the regression model

	1	2	3	4 <sup>1</sup>	5
1. Physical activity Log Tx	1.000	.429*	.298*	.201*	.097
2. Self-efficacy for PA	.429*	1.000	.116	.265*	.109
3. Encouragement for PA	.298*	.116	1.000	.107	.137**
4. Gender <sup>1</sup>	.201*	.265*	.107	1.000	.088
5. Neighbourhood influence on PA	.097	.109	.137**	.088	1.000

Note: \* p < 0.01; \*\* p < 0.05

<sup>1</sup> Point Biserial correlations: Males coded as 1; Females as 0

There is no substantial intra-correlation of predictors indicating they are probably measuring different things and there is little collinearity. Pallant (2010) says that correlations

between predictors of  $r > .7$  are problematic. However, the significant correlation between gender and self-efficacy is large compared to the other correlations in this study, indicating there may be an influential degree of shared variance between gender and self-efficacy. However, the average VIF value for the four predictors is 1.061, close to 1 indicating collinearity is not a problem in this model.

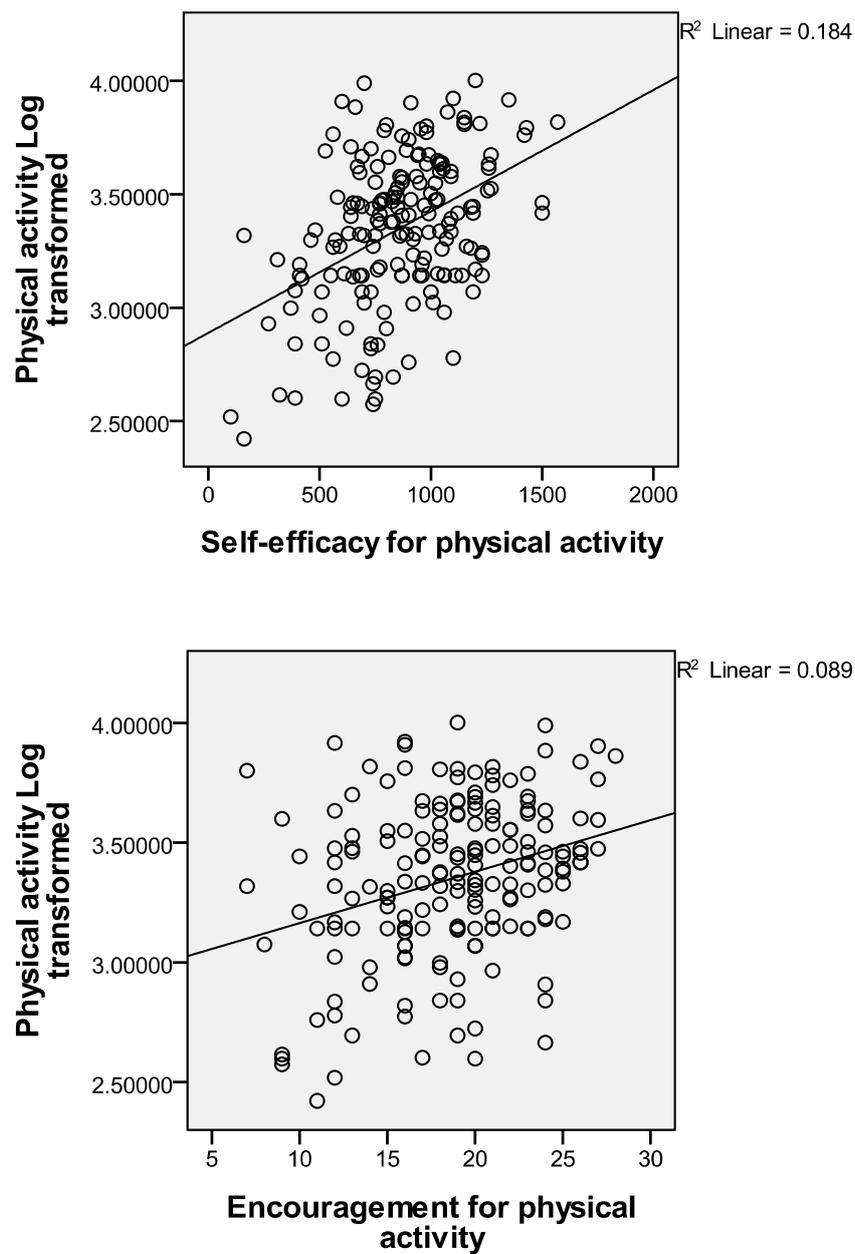


Figure 3 Scatterplots of physical activity Log transformed against self-efficacy for PA and encouragement for PA

The model complies with Field's (2009) recommendation of a Durbin-Watson statistic value close to 2 as a check for correlation between residuals. Mahalanobis ( $< 13$ ) and Cook's distances ( $< 0.05$ ) are within tolerance set by Field (2009); with no excessive leverage by extreme cases. Normal probability plots of the standardised residuals show that the assumptions of the regression model have been met and the residuals scatterplot shows no outliers  $> 3.3$  or  $< -3.3$ . The model's predictive parameters are outlined in Table 6. Self-efficacy for physical activity has the strongest independent effect on physical activity with a  $\beta = .379$ . Part correlation squared for self-efficacy gives a value of 13% which represents a unique contribution of more than half the model's 25% predictive power. Encouragement having a  $\beta$  of .244 contributes 5% to the overall 25%. Beta values for self-efficacy and encouragement for physical activity were statistically significant. Gender ( $\beta = .072$ ) was not a significant predictor of physical activity according to the model. Neighbourhood influence on physical activity ( $\beta = .016$ ) was not statistically significant and made the least contribution to the model. Physical activity can be calculated from the values of predictor variables by putting the unstandardised coefficients into the regression equation with the raw score for each variable:

$$\text{Criterion} = y \text{ intercept (Constant)} + B(\text{predictor}) + \dots$$

$$\text{Physical activity} = 2.503 + 0.0001(\text{Self-efficacy}) + 0.018(\text{Encouragement}) + 0.048(\text{Gender}) \\ + 0.001(\text{Neighbourhood influence})$$

The above calculation uses the units in which the variables were measured; however, the standardised coefficient  $\beta$  represents the change, measured in standard deviations, in the criterion variable that is brought about by a change in standard deviations of the value of a predictor variable.

Hence: Change in criterion = 1 Standard Dev of criterion  $\times$   $\beta$  value predictor

Table 6 Model parameters

	B	SE B	$\beta$	t	Sig.	Part Corr.
Constant	2.503	.189		13.256	.000	
Self-efficacy for PA	.0004	.0001	.379	5.570	.000	.363
Encouragement for PA	.018	.005	.244	3.685	.000	.240
Gender	.048	.045	.072	1.065	.289	.069
Neighbourhood infl. on PA	.001	.004	.016	.235	.814	.015

Dependent variable: Physical activity Log transformed

For a change of 1 standard deviation in self-efficacy for PA the model predicts  $2014 \times 0.379 = 763$  MET per week change in physical activity, for encouragement for PA:  $1SD = 2014 \times 0.244 = 491$  MET, gender:  $1SD = 2014 \times 0.072 = 145$  MET, and neighbourhood influence:  $1SD = 2014 \times 0.016 = 32$  MET. In relation to the above calculations it is notable that gender is a dichotomous variable and can only change in whole units or one standard deviation.

## Discussion

The purpose of this project was to investigate the predictive utility of individual, social, and environmental factors for physical activity during emerging adulthood and to explore the different patterns of physical activity for men and women during this period. The transition from adolescence to adulthood is an important but overlooked time for studying modifiable weight related behaviour (Bell & Lee, 2005; Nelson, et al., 2008). Obesity is a major public health concern in Ireland where more than 50% of the adult population are not active enough to be healthy (HSE, 2009). This research used a social-ecological model as a guide in selecting four variables to represent everyday interactions that may lead emerging adults to adopt an active lifestyle.

Multiple linear regression analysis found the hypothesised model a moderate fit for the data accounting for 25% of the variance in physical activity for this sample, or 23.5% if generalised to the true population. Each of the predictor variables made a positive contribution to the outcome variable. As hypothesised self-efficacy and encouragement were significant predictors of physical activity for emerging adults. Contrary to hypothesis gender and neighbourhood influence were found to be non-significant predictors of physical activity. While these results are in line with Bronfenbrenner's (1977) idea that multilevel influences shape behavioural development the magnitude of the relationships are less than would be expected. In support of the second hypothesis emerging adult males reported greater physical activity and self-efficacy for physical activity than did females, however, the third hypothesis was not supported by the data which indicated no significant difference between female and male scores on encouragement for physical activity or neighbourhood influence on physical activity.

### *Emerging Adulthood and Physical Activity*

Regular physical activity can improve physical and mental health, protect against non-communicable diseases, enhance quality of life, and increase life expectancy ( Chaput, et al. 2011; Downs & Ashton, 2011; Middleton, et al. 2010). It is important to note that the people who took part in this study were an active and probably healthy group of individuals; more than 80% of them exceeded the recommended weekly activity level for adults. Participants reported mean energy expenditure of almost 900 MET per week more than college students of a similar age who participated in research by Downs and Ashton (2011). The new developmental period of emerging adulthood is neither adolescence nor adulthood but a prolonged transition between the two. The main proponent of this period as a separate developmental stage, Arnett (2000), says one of its defining characteristics is that people at this age do not feel like they are fully adults but neither do they feel that they are still adolescents. Although most emerging adults that took part in this research exceeded the recommended minimum weekly energy expenditure for persons over 18 years less than one quarter met the minimum requirement that would have applied to them before their 18<sup>th</sup> birthday. While it is not known if the participants of this study were active adolescents; previous research has shown that exercise behaviour often does not track from adolescence into adulthood (Boreham, et al., 2004; Zimmerman-Sloutkis, et al., 2010). However, for those individuals who are meeting the recommendations during each stage the transition to adulthood involves a substantial change in energy balance that can lead to obesity. This decrease in physical activity between the ages of 18 and 25 years may be in part due to the lack of guidelines that are specific to this period combined with the scarcity of programs that are tailored to the needs of emerging adults (Bell & Lee, 2005; Gokee-LaRose, et al., 2009; Maher, et al., 2012). It is hoped that information gathered by the current research can inform practical guidelines and effective programs. The IPAQ measure used in this research asks

participants to report the number of hours per day they spend sitting. While this data is not used in the measure's calculations it is notable in the light of recent research which found that spending more than 2 hours per day in sedentary behaviour is negatively associated with moderate to vigorous physical activity (Melkeiv, Torsheim, Iannotti, & Wold, 2010). Respondents to the present study reported spending a substantial amount of time sitting. Furthermore, Patel, et al. (2010) found that time spent sitting is independently associated with total mortality regardless of physical activity; the authors recommend interventions to reduce sitting time as well as increasing activity.

### *Self-efficacy and Physical Activity*

In the present study self-efficacy for physical activity was the strongest predictor of physical activity for emerging adults ( $\beta = .379$ , Sig.  $<0.01$ ). This is consistent with previous studies conducted across a range of populations (Lee, et al., 2010; Pan, et al., 2009; Van Dyck, et al., 2011). The findings of the present research are in keeping with cognitive theories within health psychology such as social-cognitive theory (Bandura, 2006) and self-determination theory (Ryan & Deci, 2004) that posit self-efficacy as a determinant of physical activity. A common tenet of these theories is that a confident optimistic self-belief influences the direction, intensity and persistence of behaviour. People who have stronger self-efficacy for physical activity will participate in a greater number of activities, will be less hindered by barriers to physical activity, be more regular exercisers, and gain more personal benefits from being physically active (Bandura, 2006). According to self-determination theory behaviour is determined by autonomy support, psychological needs and motivation (Ryan & Deci, 2004). In the physical activity domain social cognitive theory and self-determination theory agree that humans are agents of their own actions (Sweet, Fortier, Strachan, & Blanchard, 2012). A social cognitive model of physical activity tested by

Rovniak, Anderson, Winett, and Stephens (2002) explained 55% of the variance in physical activity among university students with exercise self-efficacy having the largest unique contribution. The authors believe that self-efficacy influences physical activity among university students because it improves their self-regulatory ability. Improving exercise self-efficacy by providing mastery experiences enables people to plan physical activities that are suitable to their ability. Emerging adults have difficulties in maintaining adequate levels of physical activity that may be related to poor self-regulatory skills (Strong, Parks, Anderson, Winett, & Davy, 2008). Constructs from self-determination theory were used by Ulrich-French, et al. (2012) to interpret the changes in physical activity during the transition to adulthood. They report self-determined regulation to be a consistent predictor of physical activity during this developmental period and associate a decline in the value and importance of physical activity with declining self-determined motivation for physical activity. The authors suggest that university authorities give greater priority to physical activity and provide a range of physical activity experiences that increase exercise self-efficacy by fostering competence and autonomy. Self-efficacious beliefs about physical activity do not always translate into action. Strong, et al. (2008) found that college students were confident that they could exercise more if they needed to, were aware of the benefits of physical activity, and were confident that they knew how to improve their fitness if they had to. However, the same students reported they would not implement changes to increase their physical activity unless they developed a physical activity related disease or illness. In the present research participants who reported strong self-efficacy for physical activity also reported a high level of physical activity. The development of psychosocial factors such as self-efficacy that takes place between the ages of 18 and 25 years is central to the formation of an adult identity. Assimilating a healthy lifestyle into the concept of one's self may be a particularly important foundation for lifespan health behaviour (Nelson, et al., 2008). Self-

efficacy plays a pivotal role in personal agency (Bandura, 2001). A meta-analysis of the moderators of self-efficacy used in interventions to increase physical activity suggests that several commonly used techniques can be ineffective or even counterproductive (Ashford, Edmunds, & French, 2010). Interventions that included graded mastery, in which the performance of the activity became increasingly harder, had lower scores on self-efficacy for physical activity than those that did not use this strategy. Ashford, et al. (2010) found that although verbal persuasion was used in 89% of the interventions there was a significant negative relationship between verbal persuasion and exercise self-efficacy. The current research indicates that interventions that increase exercise self-efficacy may have a positive effect on levels of physical activity during emerging adulthood. According to Hagger, Chatzisarantis, and Biddle, (2001), young people who have positive attitudes about their personal capacity to exercise in the face of constraints are more likely to form intentions to engage in physical activity.

### *Encouragement and Physical Activity*

The social aspect of the current research focused on assessing the influence of social support in the form of encouragement from friends, family or peers has on physical activity during emerging adulthood. Results show that encouragement for physical activity with a  $\beta$  value of .244 was a significant predictor of physical activity. This is consistent with the Theory of Planned Behaviour (TPB) which predicts that individuals with high levels of social support are more likely to be physically active (Ajzen, 2002). The TPB says that that social support instils positive, normative, behavioural, and control beliefs about the planned behaviour. Encouragement to be physically active, especially when it comes from important others, creates a positive attitude about physical activity which in turn strengthens a person's intention to engage in the activity, and intention is the antecedent of the behaviour. Ajzen

(2002) says that perceived behavioural control, which he approximates to self-efficacy, acts in tandem with intention as actual behavioural control. According to the TPB encouragement and self-efficacy contribute to the prediction of the particular behaviour. The present study aimed to capture the social support of the extended family, friends, and other acquaintances by asking participants to what extent they felt encouraged to be physically active.

Encouragement is thought to have an immediate direct influence on physical activity along with a lasting but indirect influence by enhancing self-efficacy (Hoepa, et al., 2007; Trost, et al., 2003). Correlations from the current research show that self-efficacy for physical activity and encouragement are not significantly interrelated. This suggests that each makes a unique contribution to physical activity motivation for participants in this study. Ball, Jefferey, Abbott, McNaughton, and Crawford (2010) believe that social norms and social support are separate parts of the social environment. Difficulties with conceptualisation and measurement have meant that findings of research into the predictive power of social norms for physical activity have been inconsistent. Social support in the form of encouragement, on the other hand, has been found to be a determinant of physical activity (Okun, et al., 2003). Although the influence of parents, family and friends on the physical activity of children and adolescents is well documented in the literature, few research projects have examined these issues among emerging adults. Strong, et al. (2008) in research with young adult college students using structured qualitative assessments found that social support from friends was positively correlated with daily step counts and negatively correlated with sedentary behaviour. Students reported that exercising with friends is socially rewarding. The study goes on to say that socialising was given a greater priority than exercising and suggests that physical activity interventions tailored for social groups are more effective than those that target individuals (Strong, et al., 2008).

The period of emerging adulthood is marked by important events such as leaving home and imposed self-reliance. This may be a time where influential shifts in family and social networks may leave young people in need of encouragement to maintain their physical activities (Nelson, et al., 2008). Emerging adulthood is associated with the progressive development of positive social functioning which is in part due to an individual's greater control in selecting friends and romantic partners (Pettit, Roberts, Lewinsohn, Seely, & Yaroslavsky, 2011). The current research finds that physically active emerging adults felt that they were encouraged to be active by others. When taken along with the findings of other research this would indicate that interventions to increase physical activity may be effective if they improve social support encouragement while being aware of fluctuations in social networks and developing personal agency that are characteristic of emerging adulthood.

#### *Neighbourhood Influence and Physical Activity*

The present study also failed to find a significant association between neighbourhood influences and physical activity ( $\beta = .016$ ,  $p = .814$ ). While this differs from research by others (Van Dyck, et al., 2011) such results are not unusual in what is an emerging field of research (Lightfoot & Blanchard, 2011). In a systematic review of the literature Wendel-Vos, et al. (2007) found only a small number of positive relationships between environmental determinants and adult physical activity. Their findings that 75% of the 47 primary studies examined showed null associations led them to conclude that either neighbourhood characteristics do not have an important influence on physical activity or that individual/environment interactions were not being accurately measured. McCormac and Shiell (2011) also found mixed results in a review which included 20 cross-sectional and 13 quasi-experimental studies. Evidence from the review, which controlled for neighbourhood

self-selection, revealed positive, null, and even negative associations between environmental supports and adult physical activity. A review aimed at summarising Europe-specific research on the relationship between neighbourhood factors and physical activity by Van Holle, et al. (2012) found environmental features such as access to facilities, neighbourhood aesthetics, and neighbourhood safety were unrelated to adult physical activity in Europe. Research on neighbourhood influences on physical activity rarely treats emerging adults as a separate group, however, research with college students of a comparable age have revealed similar inconsistent patterns of neighbourhood influence as seen in adult research ( De Vet, et al., 2011; Lightfoot & Blanchard, 2011). The authors attribute the inconsistency in findings to methodological and theoretical difficulties in measuring environmental influences. They believe that accurate models are required to explain the under-lying process by which the environment acts on physical activity behaviour and that link factors and combinations of factors to specific activities. Sallis, Owen, & Fisher (2008) say that research derived from social ecological models pose a particular challenge in that there is often too little variation in environmental factors. In the present study scores for neighbourhood influences on physical activity have a possible range from 11 to 55; however, responses are clustered at the high end of the range with a mean and median of 39 an quartile range of 8. Lack of variation, according to Sallis, et al. (2008), can make hypotheses testing impractical which is a possible explanation for the lack of association in the present study between neighbourhood influence and physical activity. However, the lack of variation and high end tendency may accurately reflect the lack of variation in physical activity facilities in the neighbourhoods where the respondents live. Schüz, et al, (2012) say that individuals from wealthier neighbourhoods have higher levels of physical activity because the translation of attitudes into activity is easier in wealthier neighbourhoods. Another possible explanation is that individuals who engage in physical activity and who are personally or socially motivated to be active are

more likely to find facilities and supports in their neighbourhood than their less active counterparts. The present research serves to highlight the complex nature of associating neighbourhood influence and physical activity and suggests that the environment may not play a large part in determining physical activity during emerging adulthood. However, further research is required to clarify the situation.

### *Gender and Physical Activity*

This study found that gender is not a significant predictor of physical activity for emerging adults ( $\beta = .072$ ;  $p = .289$ ). This finding is in contrast to research by others (Bopp, et al., 2006; El Ansari, et al., 2011).

Male participants in the present study engaged in more physical activity per week and reported higher self-efficacy for physical activity than their female counterparts; the differences were statistically significant with small effect sizes. These findings are consistent with other studies in different populations (Dowda, et al., 2003; Eyster, et al., 2002; Pan, et al., 2009; Zimmerman-Sloutkis, et al., 2010). While there was a significant correlation between gender and physical activity the relationship was no longer significant when the variables were incorporated into multivariate analysis. Regression results indicate that this variance is probably shared with another predictor. In view of the significant correlation between gender and self-efficacy for physical activity scores in the present research a possible interpretation of the results is that the observed difference in physical activity between males and females is best explained by a difference in exercise self-efficacy. Shiffren, et al. (2003) says that differences in physical activity behaviour between males and females cannot be entirely attributed to biology. The relationship between social cognitive constructs and physical activity in college students was studied by Doersksen, Umstadd, & McAuley (2009). Their results revealed that self-efficacy to overcome situational and

personal barriers was a significant independent predictor of vigorous physical activity but not predictive of moderate activity. The present research found that while total weekly activity for females was less than for males walking and moderate activity were approximately the same for each gender. This differs in some extent to the Irish health and lifestyle survey (SLÁN 2007) that found females engaged in more mild and moderate levels of physical activity than males (Ward, et al., 2009) . In the present study walking was the favourite activity for females, accounting for 64% of their weekly energy expenditure. Walking was also popular with males making up half of all their physical activity. Similarly, Dowda, et al. (2003) in their study with young adults from three race/ethnic groups report that walking was the principal type of physical activity across race and gender. Male respondents to the current study reported significantly more vigorous activity than females which corresponds with higher exercise self-efficacy. The outcome of this is that the MET contribution from vigorous activity, which is weighted by a factor of 8 in the IPAQ instrument, represents the greater part of the gender difference in physical activity. A large European study, the Healthy Lifestyle in Europe by Nutrition in Adolescence (HELENA), found that males partook in more vigorous physical activity (Ottevaere, et al., 2011). Conversely, Downs and Ashton, (2011) in their research with college students found no difference in levels of vigorous physical activity between males and females. An understanding of the effects of self-efficacy on physical activity and how they may be subjectively different for men and women during emerging adulthood will help to inform strategies to promote and maintain active lifestyles (Cramp & Bray, 2011; Frederick-Recsacino, 2004).

While encouragement for physical activity was a significant predictor of physical activity in this current research, results did not identify a significant difference in encouragement between males and females. This is in contrast to research by others where females reported getting greater support for their physical activity than did males (Gruber,

2008; Molloy, et al., 2010). However, the current result is in line with Van Dyck, et al. (2011) who observed social support from family and friends to be a strong psychosocial correlate of physical activity regardless of gender. Gruber (2008) suggests that males and females have different patterns of social support when it comes to physical activity and that social support for physical activity depended on the gender make up of an individual's peer group. Egli, Bland, Melton, & Czech (2011) found that male and female college students are motivated to take part in physical activity for entirely different reasons. Their research indicated that males are motivated by intrinsic factors, whereas females tend to be motivated by extrinsic factors.

The present study found neighbourhood influence on physical activity to be approximately the same for males and females. This finding differs to that of Reed and Ainsworth (2007) who found that female university students' perceptions of environmental supports and neighbourhood safety were significantly related to physical activity. Velasquez, et al. (2009) also found perceptions of the physical characteristics of the neighbourhood and use of facilities was significantly related to physical activity for women alone. However, Lightfoot and Blanchard (2011) found that gender did not influence the physical activity/environment relationship. The present research is in agreement with the findings of Pan, et al (2009) that patterns of physical activity and correlates are differently related for men and women. These findings highlighted the need for physical activity interventions that are tailored to the different needs of males and females during in emerging adulthood.

#### *Limitations, Strengths, and Implications for Further Research*

There are limitations to this research that require mention. Non-probability sampling was used to draw participants from a conveniently available population and participation was largely self-selected. The sample is likely to have come from a homogeneous population in

regard to their socio-economic status, ethnicity, education, and physical ability. In this research there was an overrepresentation of college students in the sample, although participants were also recruited in the researcher's neighbourhood it is likely that many of those who responded were also attending college. Results of research into aspects of emerging adulthood cannot be generalised to the population unless it includes those who are not pursuing a college education (Maher, et al., 2012). The use of retrospective self-report questionnaires can lead to inaccurate reporting of physical activity due to recall bias, social desirability and sociability (El Ansari, et al., 2011). As mean physical activity levels in this study were higher than in similar studies it is possible that the nature of the self-report has allowed individuals to overestimate their level of physical activity. Furthermore, self-report of physical activity covers a short recall period and does not necessarily reflect activity that is stable over time (Reed & Ainsworth, 2007). The correlational design of the present study means that no causal relationship can be inferred from the hypothesised model. The non association of physical activity with neighbourhood influences in the present study may be due to a mismatch between the instruments used. The IPAQ does not specify type of physical activity and the BRFSS only specifies walking and general activity. It is possible that respondents may have not related neighbourhood factors with their own preferred activities.

In spite of its many limitations the current research contributes to the limited body of research that exists into physical activity during emerging adulthood. A key strength of using an ecological model is that the same framework can be used to construct interventions that influence key moderators of physical activity during this important stage. Multi-level research can gather information as to how influential moderators are best changed to benefit the greater number of people. Future research can incorporate additional levels in different contexts. The hypothesised model was only able to explain one quarter of the variance in

physical activity behaviour of emerging adults. This suggest that other variables not included in this research are important influences on physical activity during this period or that the variables included in this study if subjected to more sensitive measurement may be found to have a greater influence. Future research with larger samples and sensitive instruments is required to better describe variables and capture their mediating effects. Longitudinal studies are needed to determine if there are actual decreases in physical activity during this period and the extent to which differences in activity patterns across genders established during emerging adulthood remain throughout the lifespan.

### *Conclusion*

This research project although modest in its scope and findings has contributed to the process of merging the new developmental period of emerging adulthood with existing research into the determinants of physical activity over the lifespan. The study identified self-efficacy and encouragement as significant predictors of physical activity participation during emerging adulthood while suggesting that neighbourhood influence does not have an important effect on physical activity during this period. Gender differences occurred in physical activity and attitude to physical activity. Men and women reported similar social and environmental influences on their physical activity. A key finding of the current research is that physical activity is not a function of gender during emerging adulthood. Emerging adults who took part in this study had a high level of physical activity and most exceeded adult physical activity recommendations. However the present study maintains that meeting adult requirements represents a dramatic decline in physical activity over the transition to adulthood. It is hoped that the results of this project will help to establish continuity of physical activity from adolescence to adult life that prevents weight-related behaviour change.

## References:

- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology*, 32(4), 665-683.
- Arnett, J.J. (2000). Emerging adulthood: a theory of development from the late teens through the twenties. *American Psychologist*. 55(5): 469-480.  
doi: 10.1037//0003-066X.55.5.469
- Ashford, S., Edmunds, J., & French, D.P. (2010). What is the best way to change self-efficacy to promote lifestyle and recreational physical activity? A systematic review with meta-analysis. *British Journal of Health Psychology*. 15: 265-288.  
doi: 10.1348/135910709X461752
- Ball, K., Jeffery, R.W., Abbott, G., McNaughton, S.A., & Crawford, D. (2010). Is healthy behaviour contagious: associations of social norms with physical activity and healthy eating. *International Journal of Behavioral Nutrition and Physical Activity*. 7(86).  
doi: 10.1186/1479-5868-7-86
- Bandura, A. (2001). Social cognitive theory: an agentic perspective. *Annual Review of Psychology*. 52: 1-26
- Bandura, A. (2006). *Self-Efficacy Beliefs of Adolescents*. Charlotte, North Carolina: Information Age Publishing
- Bell, S. & Lee, C. (2005). Emerging adulthood and patterns of physical activity among young Australian women. *International Journal of Behavioural Medicine*. 12(4): 227-235. doi: 10.1207/s15327558ijbm1204\_3.
- Bopp, M., Wilcox, S., Laken, M., Butler, K., Carter, R.E., McClorin, L., & Yancey, A. (2006). Factors associated with physical activity among African-American men and women. *American Journal of Preventive Medicine*. 30(4): 340-346.  
doi: 10.1016/j.amepre.2005.11.007

- Boreham, C., Robson, P.J., Gallagher, A. M., Cran, G. W., Savage, M. & Murray, L. (2004). Tracking of physical activity, fitness, body composition and diet from adolescence to young adulthood: The Young Hearts Project, Northern Ireland. *International Journal of Behavioral Nutrition and Physical Activity*. 1(14). doi: 10.1186/1479-5868-1-14.
- Bronfenbrenner, U. (1977). Towards an experimental ecology of human development. *American Psychologist*. July: 513-531.
- CDC (2010) Centers for Disease Control and Prevention *Physical Activity Fact Sheets*. Retrieved from: <http://www.cdc.gov/nccdphp/sgr/summ.htm>
- Chaput, J-P., Klingensberg, L., Rosenkilde, M., Gilbert, J-A., Tremblay, A., & Sjödin, A. (2011). Physical activity plays an important role in body weight regulation. *Journal of Obesity*. doi: 10.1155/2011/360257
- Chaumeton, N., Duncan, S.C., Duncan, T.E., & Strycker, L.A. (2011). A measurement model of youth physical activity using pedometer and self, parent and peer reports. *International Journal of Behavioural Medicine*. 18: 209-215. doi: 10.1007/s12529-010-9118-5.
- Craig, C.L., Marshall, A.L., Sjöström, M., Bauman, A.E., Booth, M.L., Ainsworth, B.E., Pratt, M., Ekelund., Yngve, A., Sallis, J.F., & Oja, P. (2003). International Physical Activity Questionnaire: 12-country reliability and validity. *Medicine and Science in Sport and Exercise*. 1381-1395. doi: 10.1249/01.MSS.0000078924.61453.FB
- Cramp, A.G. & Bray, S.R. (2011). Understanding exercise self-efficacy and barriers to leisure-time physical activity among postnatal women. *Maternal and Child Health Journal*. 15: 642-651. doi: 10.1007/s10995-010-0617-4

- De Bourdeaudhuij, I., Simon, C., De Meester, F., Van Lenthe, F., Spitaels, H., Lien, N., Faggiano, F., Merken, L., Moore, L., & Haerens, L. (2011). Are physical activity interventions equally effective in adolescents of low and high socio-economic status (SES): results from the European Teenage project. *Health Education Research*, 26(1): 119-130. doi: 10.1093/her/cyq080
- De Vet, E., De Ridder, D.T.D., & De Wit, J.B.F. (2011). Environmental correlates of physical activity and dietary behaviours among young people: a systematic review of reviews. *Obesity Reviews*, 12: 130-142. doi: 10.1111/j.1467-789X.2010.00784.x
- Dishman, R.K., Vandenberg, R.J., Motl, R.W., & Nigg, C.R. (2010). Using constructs of the transtheoretical model to predict classes of change in regular physical activity: a multi-ethnic longitudinal cohort study. *Annals of Behavioral Medicine*, 40: 150-163. doi: 10.1007/s12160-010-9196-2
- Doerksen, S.E., Umstatter, M.R., & McAuley, E. (2009). Social cognitive determinants of moderate and vigorous physical activity in college freshmen. *Journal of Applied Social Psychology*, 39(5): 1201-1213.
- Dowda, M., Ainsworth, B.E., Addy, C.L., Saunders, R., & Rinner, W. (2003). Correlates of physical activity among U.S. young adults, 18 to 30 years of age, from NHANES III. *Annals of Behavioral Medicine*, 26(1): 15-23.
- Downs, A. & Ashton, J. (2011). Vigorous physical activity, sports participation, and athletic identity: Implications for mental and physical health in college students. *Journal of Sport Behaviour*, 34: 228-249.
- Duncan, S.C. Duncan, T.E., & Strycker, L.A. (2005). Sources and types of social support in youth physical activity. *Health Psychology*, 24(1): 3-10. doi: 10.1037/0278-6133.24.1.3

- Duncan, S.C., Duncan, T.E., Strycker, L.A., & Chaumeton, N.R. (2004). A multilevel approach to youth physical activity research. *Exercise and Sport Sciences Review*. 32(3): 95-99.
- Egli, T., Bland, H.W., Melton, B.F., & Czech, D.R. (2011). Influence of age, sex, and race on college students' exercise motivation and physical activity. *Journal of American College Health*. 59(5): 399-406. doi:10.1080/07448481.2010.53074
- El Ansari, W., Stock, C., John, J., Deeny, P., Phillips, C., Snelgrove, S., Adetunji, H., Hu, X., Parke, S., Stoate, M., & Mabhala, A. (2011). Health promoting behaviours and lifestyle characteristics of students at seven universities in the U.K. *Central European Journal of Public Health*. 19(4): 197-204.
- Eyler, A.E., Wilcox, S., Matson-Koffman, D., Evenson, K.R., Sanderson, B., Thompson, J., Wilbur, J-E., & Rohm-Young, D. (2002) Correlates of physical activity among women from diverse racial/ethnic groups. *Journal of Women's Health & Gender Based Medicine*. 11(3): 239-253.
- Fernstrom, M.H., Reed, K.A., Rahavi, E.B., & Dooher, C.C. (2012). Communication strategies to help reduce the prevalence of non-communicable diseases: Proceedings from the inaugural IFIC Foundation Global Diet and Physical Activity Communications Summit. *Nutrition Reviews*. 70(5): 301-310. doi: 10.1111/j.1753-4887.2012.00480.x
- Field, A. (2009). *Discovering Statistics Using SPSS*. (4<sup>th</sup> ed.) London:Sage
- Frederick-Recascino, C.M. (2004). Self-determination theory and participation motivation research in the sport and exercise domain. In: Deci, E.L. & Ryan, R.M. *Handbook of Self-Determination Research*. New York: University of Rochester Press.

- Gokee-LaRose, J., Gorin, A.A., Raynor, H.A., Laska, M. N., Jeffery, R.W., Levy, R.L., & Wing, R.R. (2009). Are standard behavioural weight loss programs effective for young adults? *International Journal of Obesity*. 33: 1374-1380.  
doi: 10.1038/ijo. 2009.185.
- Gokee-LaRose, J., Leahey, T.M., Weinberg, M., Kumar, R., & Wing, R.W. (2012). Young adult's performance in a low-intensity weight loss campaign. *Obesity*. 30.  
doi: 10.1038oby.2012.30
- Gruber, K.J. (2008). Social support for exercise and dietary habits among college students. *Adolescence*. 42(171):557-575.
- Hagger, M.S., Chatzisarantis, N., & Biddle, S.J.H. (2001). The influence of self-efficacy and past behaviour on the physical activity intentions of young people. *Journal of Sports Sciences*. 19: 711-725.
- Health Service Executive. (2009). *The National Guidelines on Physical Activity for Ireland*. Dublin: Department of Health and Children. Retrieved from:  
<http://www.getirelandactive.ie>
- Hoepa, M., Scragg, R., Schofield, G., Kolt, G.S., & Schaaf, D. (2007). Social support for youth physical activity: Importance of siblings, parents, friends and school support across a segmented school day. *International Journal of Behavioral Nutrition and Physical Activity*. 4(54). doi: 10.1186/1479-5868-4-54
- IPAQ (2002). International Physical Activity Questionnaire. (Accessed at [www.ipaq.ki.se](http://www.ipaq.ki.se))
- Jose, K.A., Blizzard, L., Dwyer, T., McKercher, C., & Venn, A.J. (2011). Childhood and adolescent predictors of leisure time physical activity during the transition from adolescence to adulthood: a Population based cohort study. *International Journal of Behavioural Nutrition and Physical Activity*. 8(54). doi: 10.1186/1497-5868-8-54

- Jung, M. E., Bray, S. R., & Martin-Ginis, K. A. (2008). Women's behavior change and the frosh 15: tracking physical activity and dietary patterns in 1<sup>st</sup> year university students. *Journal of American College Health* 56, 523-530.
- Keegan, R. J., Biddle, S.J.H., & Lavalee, D.E. (2010). It's not how old you are, it's where you're at in life: Application of a life-span framework to physical activity in examining community and environmental interventions. *Sport & Exercise Psychology Review*, 6(1):19-34.
- Kirtland, K.A., Porter, D.E., Addy, C.L., Neet, M.J., Williams, J.E., Sharpe, P.A., Neff, J.L., Kimsey, C.D., & Ainsworth, B.E. (2003). Environmental measure of physical activity supports: Perception versus reality. *American Journal of Preventive Medicine*. 24(4): 323-331. doi:10.1016/S0749-3797(03)00021-7
- Kloep, M. & Hendry, L.B. (2010). Letting go or holding on? Parents' perceptions of their relationships with their children during emerging adulthood. *British Journal of Developmental Psychology*. 28: doi: 10.1348/026151009X480581
- Lee, K.S., Loprinzi, P.D., & Trost, S.G. (2010). Determinants of physical activity in Singaporean adolescents. *International Journal of Behavioral Medicine*. 17: 279-286. doi: 10.1007/s12529-009-9060-6
- Lightfoot, K. & Blanchard, C. (2011). Does race or sex moderate the perceived built environment/physical activity relationship in college students? *Behavioral Medicine*. 37: 54-59. doi: 10.1080/08964289.2011.571305
- Maher, J.P., Doerksen, S.E., Elavskey, S., Hyde, A. L., Pincus, A.L. Ram, N., & Conroy, D.E. (2012). A daily analysis of physical activity and satisfaction with life in emerging adults. *Health Psychology*. doi: 10.1037/a0030129

- McCormack, G.R. & Shiel, A. (2011). In search of causality: a systematic review of the relationship between the built environment and physical activity among adults. *International Journal of Behavioral Nutrition and Physical Activity*. 8:125. doi: 10.1186/1479\_5868-8-125
- Melkevik, O., Torsheim, T., Iannotti, R.J., & Wold, B. (2010). Is spending time in screen-based sedentary behaviour associated with less physical activity: a cross national investigation. *International Journal of Behavioral Nutrition and Physical Activity*. 7(46). doi:10.1186/1479-5868-7-46
- Middleton, L.E., Barnes, D.E., Lui, L.Y., & Yaffe, K. (2010) Physical activity over the lifecourse and its association with cognitive performance and impairment in old age. *Journal of the American Geriatrics Society*, 58(7): 1322-1326. doi: 10.1111/j.1532-5415.2010.02903.x
- Mo, P.K.H., Blake, H., & Batt, M.E. (2011). Getting healthcare staff more active: The Mediating role of self-efficacy. *British Journal of Health Psychology*. 16: 690-706. doi: 10.1111/j.2044-8287.2010.02007.x
- Molloy, G.J., Dixon, D., Hamer, M., & Sniehotta, F.F. (2010). Social support and regular physical activity: does planning mediate this link? *British Journal of Health Psychology*. 15: 859-870. doi: 10.1348/135910710x490406
- Nelson, M.C., Storey, M., Larson, N.I., Neumark-Szainer., & Lytle, L.A. (2008). Emerging adulthood and college-aged youth: An overlooked age for weight-related behaviour change. *Obesity*. 16(10): 2205-2211. doi:10.1038/oby.2008.365
- Okun, M.A., Ruehlman, L., Karoly, P., Lutz, R., Fairholme, C., & Schaub, R. (2003). Social support and social norms: do both contribute to predicting leisure-time exercise ? *American Journal of Health Behaviour*. 27(5): 493-507.

- Ottevaere, C., Huybrechts, I., Benser, J., De Bourdeaudhuij, I., Cuenca-Garcia, M., Dallongeville, J., Zaccaria, M., Gottrand, F., Kersting, M., Rey-López, J.P., Manios, Y., Molnár, D., Moreno, L.A., Smpokos, E., Widhalm, K., & De Henauw, S. (2011). Clustering patterns of physical activity, sedentary and dietary behaviour among European adolescents; The HELENA study. *BMC Public Health*. 11:328. doi: 10.1186/1471-2458-11-328
- Pan, S.Y., Cameron, C., DesMeules, M., Morrison, M., Craig, C.L., & Jiang, X.H. (2009). Individual, social, environmental, and physical environmental correlates with physical activity among Canadians: a cross-sectional study. *Public Health*. 9(21). doi: 10.1186/1471-2458-9-21
- Patel, A.V., Bernstein, L., Deka, A., Feigelson, H.S., Campbell, P.T., Gapstur, S.M., Colditz, G.A., & Thun, M.J. (2010). Leisure time spent sitting in relation to total mortality in a prospective cohort of US adults. *American Journal of Epidemiology*. 172(4): 419-429. doi:10.1093/aje/kwq155
- Pettit, J.W., Roberts, R.E., Lewinsohn, P.M., Seely, J.R., & Yaroslavsky, I. (2011) Developmental relations between perceived social support and depressive symptoms through emerging adulthood: Blood is thicker than water. *Journal of family Psychology*. 25(1): 127-136. doi: 10.1037/a0022320
- Reed, J. & Ainsworth, B. (2007). Perceptions of environmental supports on the physical activity behaviours of university men and women: A preliminary investigation. *Journal of American College Health*. 56(2): 199-204.
- Resnick, B. & Jenkins, L.S. (2000). Testing the reliability and validity of the self- efficacy for exercise scale. *Nursing Research*. 49(3): 154-159.

- Rovniak, L.S., Anderson, E.S., Winett, R.A., & Stephens, R.S. (2002). Social cognitive determinants of physical activity in young adults: A prospective structural equation analysis. *Annals of Behavioral Medicine*. 24(2): 149-156.
- Ryan, R.M. & Deci, E.L. (2004). Overview of self-determination theory: an organismic dialectical perspective. In: Deci, E.L. & Ryan, R.M. *Handbook of Self-Determination Research*. New York: University of Rochester Press.
- Sallis, J.F. (2009). Measuring physical activity environments. *American Journal of Preventative Medicine*, 36(4), S86-S92. doi: 10.1016/j.amepre.2009.01.002.
- Sallis, J.F., Cervero, R.B., Ascher, W., Henderson, K.A., Kraft, M.K., & Kerr, J. (2006). An ecological approach to creating active living communities. *Annual Review of Public Health*. 27: 297-322.  
doi: 10.1146/annrev.publhealth.27.021405.102100.
- Sallis, J.F., Owen, N., & Fisher, E.B. (2008). Ecological models of health behaviour. In: Glanz, K., Rimer, B.K., & Viswanath, K. Eds. *Health Behaviour and Health Education: Theory, Research, and Practice*. San Francisco: Jossey-Bass
- Sallis, J.F., Prochaska, J.J., & Taylor, W.C. (2000). A review of correlates of physical activity of children and adolescents. *Medicine and Science in Sport and Exercise*. 32(5): 963-975.
- Scharoun-Lee, M., Adair, L.S., Kaufman, J.S., & Gordon-Larsen, P. (2009). Obesity, race/ethnicity and the multiple dimensions of socioeconomic status during the transition to adulthood: A factor analysis approach. *Social Science and Medicine*. 68,(4): 708-716. doi: 10.1016/j.socscimed.2008.12.009.

- Schüz, B., Wurm, S., Ziegelmann, J.P., Wolff, J.K., Warner, L.M., Schwarzer, R., & Tesch-Römer, C. (2012). Contextual and individual predictors of physical activity: interactions between environmental factors and health cognitions. *Health Psychology*, 31(6): 714-723. doi: 10.1037/a0027596
- Shifren, K., Furnham, A., & Bauserman, R. L. (2003). Emerging adulthood in American and British Samples: individuals' personality and health risk behaviors. *Journal Of Adult Development*, 10(2): 75-87. doi:1068.0667/03/0400-0075/0
- SIP 4-99 Research Group. (2002). *Environmental Supports for Physical Activity Questionnaire*. Prevention Research Center, Norman J. Arnold School of Public Health, University of South Carolina. Accessed at:  
[www.http://prevention.sph.sc.edu/tools/docs/Env\\_Supports\\_for\\_PA.pdf](http://prevention.sph.sc.edu/tools/docs/Env_Supports_for_PA.pdf)
- Stankov, I., Olds, T., & Cargo, M. (2012). Overweight and obese adolescents: what turns them off physical activity? *International Journal of Behavioral Nutrition and Physical Activity*, 9:53. doi: 10.1186/1479-5868-9-53
- Strong, K.A., Parks, S.L., Anderson, E., Winett, R., & Davy, B.M. (2008). Weight gain prevention: Identifying theory-based targets for health behaviour change in young adults. *Journal of the American Dieticians Association*, 108(10): 1708-1715. doi: 10.1016/j.jada.2008.07.007
- Sweet, S. N., Fortier, M. S., Strachan, S. M., & Blanchard, C. M. (2012). Testing and integrating self-determination theory and self-efficacy theory in a physical activity context. *Canadian Psychology/Psychologie Canadienne*, 53(4): 319-327. doi: 10.1037/a0030280
- Tabachnick, B.G. & Fidell, L.S. (2001). *Using Multivariate Statistics (4<sup>th</sup> ed.)*  
Boston: Allyn & Bacon.

- Thompson, J.L., Jago, R., Brockman, R., Cartwright, K., Page, A.S., & Fox, K.R. (2009). Physically active families: de-bunking the myth? A qualitative study of family participation in physical activity. *Child: Care, Health and Development*. 36(2): 265-274. doi: 10.1111/j.1365-2214.2009.01051.x
- Trost, S.G., Sallis, J.S., Pate, R.R., Freedson, P.S., Taylor, W. C., & Dowda, M. (2003). Evaluating a model of parental influence on youth physical activity. *American Journal of Preventive Medicine*. 25(4): 277-282. doi: 10.1016/S0749-3797(03)002174
- Ullrich-french, S., Cox, A.E., & Bumpus, M.F. (2012). Physical activity motivation and behaviour across the transition to university. *Sport, Exercise, and Performance Psychology*. doi: 110.1037/a0030632
- Van Dyck, D., Cardon, G., Delforche, B., Giles-Corti, B., Sallis, J. S., Owen, N., & De- Bourdeaudhuij, I. (2011). Environmental and psychosocial correlates of accelerometer-assessed and self-reported physical activity in Belgian adults. *International Journal of Behavioural Medicine*. 18: 235-245. doi:10.1007/s12529-010-9127-4
- Van Holle, V., Deforche, B., Van Cauwenberg, j., Goubert, L., Maes, I., Van de Weghe, N., & De Bourdeaudhuij, I. (2012). Relationship between the physical environment and different domains of physical activity in European adults: a systematic review. *BMC Public Health*. 12: 807. DOI: 10. 1186/1741-2458-12-807
- Van Oostrom, S.H., Smit, H.A., Wendel-Vos, G.C.W., Visser, M., Verschuren, W.M.M., & Picavet, H.S.J. (2012). Adopting an active lifestyle during adulthood and health-related quality of life: The Doetinchem Cohort Study. *American Journal of Public Health*. 102(11): e62-e68.

- Velasquez, K., Holahan, C., & You, X. (2009). Relationship of perceived environmental characteristics to leisure-time physical activity and meeting recommendations for physical activity in Texas. *Preventing Chronic Disease*, 6(1). Retrieved from: [http://www.cdc.gov/pcd/issues/2009/jan/08\\_0018.htm](http://www.cdc.gov/pcd/issues/2009/jan/08_0018.htm).
- Ward, M., McGee, H., Morgan, K., Van Lente, E., Layte, R., Barry, M., Watson, D., Shelley, E., & Perry, I. (2009) *SLÁN 2007: Survey of Lifestyle, Attitudes and Nutrition in Ireland. 'One Island – One Lifestyle?' Health and lifestyles in the Republic of Ireland and Northern Ireland: Comparing the population surveys SLÁN 2007 and NIHSWS 2005*, Department of Health and Children. Dublin: The Stationery Office. Retrieved from: [www.dohc.ie/publications/slan07\\_report.html](http://www.dohc.ie/publications/slan07_report.html)
- Wendel-Vos, W., Droomers, M., Kremers, S., Brug, J., & Van Lenthe, F. (2007). Potential environmental determinants of physical activity in adults: A systematic review. *Obesity Reviews*. 8: 425-440. doi: 10.1111/j.1467- 789X.2007.00307.x
- Wichstrøm, L., Von Soest, T., & Kvaalem, I. L. (2012). Predictors of growth and decline in leisure time physical activity from adolescence to adulthood. *Health Psychology*. doi: 10.1037/a0029465
- World Health Organisation (2011). *10 Facts on Physical Activity*. Retrieved from: [http://www.who.int/features/factfiles/physical\\_activity/en/index.html](http://www.who.int/features/factfiles/physical_activity/en/index.html)
- Zimmermann-Sloutkis, D., Wanner, M., Zimmermann, E., & Martin, B.W. (2010). Physical activity levels and determinants of change in young adults: a longitudinal panel study. *International Journal of Behavioral Nutrition and Physical Activity*. 7(2). doi: 10.1186/1479-5868-7-2

## APPENDIX

My name is Michael McCabe and I am conducting research in the Department of Psychology, Dublin Business School that explores factors affecting physical activity in 18 to 25 year olds. The research is being conducted as part of my studies and will be submitted for examination.

You are invited to take part in this study and participation involves completing and returning the attached anonymous survey. While the survey asks some questions that might cause some negative feelings, it has been widely used in research.

**Participation is completely voluntary and so you are not obliged to take part.**

Participation is anonymous and confidential. Thus responses can not be attributed to any one participant. For this reason, it will not be possible to withdraw from participation after the questionnaire has been collected. The questionnaires will be securely stored and data from the questionnaires will be transferred from the paper record to electronic format and stored on a password protected computer.

**It is important that you understand that by completing and submitting the questionnaire that you are consenting to participate in the study.**

Should you require any further information about the research please contact:  
mc\_cabe\_michael@hotmail.com

Thank you for taking the time to complete this survey.

Think about all the **vigorous** activities that you did in the **last 7 days**.

**Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** activities like heavy lifting, digging, aerobics, or fast bicycling?  
\_\_\_\_\_ days per week.

No vigorous physical activities skip to question 3.

2. How much time do you usually spend doing **vigorous** physical activities on one of those days?  
\_\_\_\_\_ hours per day  
\_\_\_\_\_ minutes per day  
\_\_\_\_\_ Don't know/Not sure.

Think about all the **moderate** activities that you did in the **last 7 days**.

**Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis?  
\_\_\_\_\_ days per week.

No moderate physical activities skip to question 5.

4. How much time do you usually spend doing moderate physical activities on one of those days?  
\_\_\_\_\_ hours per day.  
\_\_\_\_\_ minutes per day.  
\_\_\_\_\_ Don't know/Not sure.

Think about the time you spent **walking** in the **last 7 days**.

This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the last 7 days, on how many days did you **walk** for at least 10 minutes at a time?  
\_\_\_\_\_ days per week  
\_\_\_\_\_ Don't know/Not sure
6. How much time did you usually spend **walking** on one of those days?  
\_\_\_\_\_ hours per day  
\_\_\_\_\_ minutes per day  
\_\_\_\_\_ Don't know/Not sure

The next question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** per day?
- \_\_\_\_\_ hours per day
- \_\_\_\_\_ minutes per day
- \_\_\_\_\_ Don't know/Not sure.

**Continued**



20. How much does your **father** encourage you to be physically active or play sports?
- A lot  
 Some  
 A little  
 Not at all  
 Don't have/live with father
21. How much do your **brothers/male cousins** encourage you to be physically active or play sports?
- A lot  
 Some  
 A little  
 Not at all  
 Don't have/live with brothers/male cousins
22. How much do your **sisters/female cousins** encourage you to be physically active or play sports?
- A lot  
 Some  
 A little  
 Not at all  
 Don't have/live with sisters/female cousins
23. How much do your **friends** encourage you to be physically active or play sports?
- A lot  
 Some  
 A little  
 Not at all  
 Don't have/live with sisters/female cousins
24. How much do the people at your **college/workplace** encourage you to be physically active or play sports?
- A lot  
 Some  
 A little  
 Not at all  
 Don't have college/workplace
25. In general would you say that the people in your neighbourhood are...?
- Very physically active  
 Somewhat physically active  
 Not very physically active  
 Not at all physically active  
 Don't know/Not sure
26. Overall, how would you rate your neighbourhood as a place to walk? Would you say...?
- Very pleasant  
 Somewhat pleasant  
 Not very pleasant  
 Not at all Pleasant  
 Don't know/Not sure

27. For walking at night, would you describe the street lighting in your neighbourhood as...?  
 Very good  
 Good  
 Poor  
 Very poor  
 Don't know/Not sure
28. How safe from crime do you consider your neighbourhood to be? Would you say...?  
 Extremely safe  
 Quite safe  
 Slightly safe  
 Not at all safe  
 Don't know/Not sure
29. Generally speaking, would you say most people in your neighbourhood can be trusted?  
 Yes  
 No  
 Don't know/Not sure
30. Does your neighbourhood have any footpaths?  
 Yes  
 No  
 Don't know/Not sure
31. Do you use any private or membership only recreation facilities in your neighbourhood for physical activity?  
 Yes  
 No  
 Don't know/Not sure
32. Do you use walking trails, parks, playgrounds, sports fields in your neighbourhood for physical activity?  
 Yes  
 No  
 Don't know/Not sure
33. Do you use shopping centres in your neighbourhood for physical activity and/or walking programs?  
 Yes  
 No  
 Don't know/Not sure
34. Do you use any public recreation centres in your neighbourhood for physical activity?  
 Yes  
 No  
 Don't know/Not sure
35. Do you use schools that are open in your neighbourhood for public recreation activities?  
 Yes  
 No  
 Don't know/Not sure

What is your age? \_\_\_\_\_ **years** at last birthday.

Are you? \_\_\_\_\_ **Male**      \_\_\_\_\_ **Female**

**Your participation is much appreciated.**

---