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**Eime, R., Casey, M., Harvey, J., Sawyer, N., Symons, C., Payne, W.** (2015) Socioecological factors potentially associated with participation in physical activity and sport : A longitudinal study of adolescent girls. Journal of Science and Medicine in Sport, 18(6), 684-690.

Which has been published in final form at: http://doi.org/10.1016/j.jsams.2014.09.012

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#### Accepted Manuscript

Title: Socioecological factors potentially associated with participation in physical activity and sport: A longitudinal study of adolescent girls

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PII:	S1440-2440(14)00197-2
DOI:	http://dx.doi.org/doi:10.1016/j.jsams.2014.09.012
Reference:	JSAMS 1093
To appear in:	Journal of Science and Medicine in Sport
Received date:	13-6-2014
Revised date:	10-9-2014
Accepted date:	20-9-2014

Please cite this article as: Eime RM, Casey MM, Harvey JT, Sawyer NA, Symons CM, Payne WR, Socioecological factors potentially associated with participation in physical activity and sport: A longitudinal study of adolescent girls, *Journal of Science and Medicine in Sport* (2014), http://dx.doi.org/10.1016/j.jsams.2014.09.012

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- **1** Socioecological factors potentially associated with participation in physical activity
- 2 and sport: A longitudinal study of adolescent girls
- 3
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- 13 Word count: 2905
- 14 Abstract word count: 247
- 15 Tables: 2
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#### 19 Abstract

20 Objectives: Many adolescents are not physically active enough to receive associated health 21 benefits. Furthermore, participation in physical activity (PA) generally declines during 22 adolescence, and to a greater degree for females. Longitudinal research is required to better 23 understand the determinants of change in PA by adolescent females to inform PA-related 24 policy and practice. This study explored patterns of change in socioecological factors 25 hypothesised to be associated with physical activity and sport, across the adolescent period 26 for females. **Methods:** This longitudinal study employed three annual surveys of females 27 from metropolitan and non-metropolitan areas recruited in Year 7 (n=328) and Year 11 28 (n=112). Self-report measures included questions regarding general barriers to participation, 29 as well as factors relating to the socioecological domains. Results: The barriers where 30 significant changes within or differences between cohorts were observed were mostly 31 intrapersonal (lack of energy, lack of time due to other leisure activities). Lack of time was 32 more prevalent in the Year 11 cohort than in the Year 7 cohort. Perceived importance of life 33 priorities mainly related to education and study and more so for the Year 11 cohort. 34 Perceived competence declined for the Year 7 cohort. Support from family and peers trended 35 downwards in both cohorts, whereas access to facilities increased both within and between 36 cohorts. Conclusions: Significant patterns of change in the determinants of PA participation 37 were observed across the adolescent period. It is important to consider flexible structure and 38 scheduling of PA and strategies to develop competency in childhood and early adolescence.

39

40 **Keywords:** longitudinal, physical activity, determinants, females

41

#### 42 Introduction

43 Females are commonly identified as being less active than males<sup>1</sup>. Furthermore, an 44 Australian study reported that fewer than half of adolescent females are active enough to 45 meet the physical activity (PA) guidelines<sup>2</sup>. The adolescent period is recognised as a difficult 46 and stressful period of life transition. During this time life there are many biological, environmental, social and psychological transformations which influence changes in PA<sup>3,4</sup>. 47 48 As a result of the low levels of PA, particularly among adolescent girls, researchers have sought to understand determinants of participation in PA from both quantitative <sup>5, 6</sup> and 49 qualitative <sup>4, 7, 8</sup> perspectives. 50

51 A systematic review of prospective studies quantifying change in PA in children and 52 adolescents found that the majority of quantitative studies have been conducted in North America among 10 – 13 year olds <sup>5</sup>. For these children, PA tended to increase over time, and 53 previous PA and self-efficacy were consistently positively associated with this change <sup>5</sup>. For 54 55 adolescents 14 years and older, smaller declines occurred in PA, with perceived behavioural 56 control, social support and self-efficacy being negatively associated with declines in PA<sup>5</sup>. 57 However, the determinants examined were mostly limited to individual factors which were not investigated across the studies in a consistent manner and not all established correlates 58 59 could be confirmed longitudinally <sup>5</sup>. Historically, research has focused on individual-level factors and only recently have ecological models been adopted <sup>6</sup> and evidence 60 encompassing all domains of the ecological model identified in an holistic manner <sup>5</sup>. 61 62 The socioecological model was developed to demonstrate multiple levels of 63 influences on health behaviours including intrapersonal, interpersonal, organisational, community and public policy levels<sup>9</sup>. Socioecological models have been applied to 64 65 qualitative studies to determine the multiple influences on participation in PA among adolescents<sup>4, 7, 10</sup>. These studies found that environmental factors including proximity, cost, 66

67	and access to facilities were important <sup>4, 7, 10</sup> , especially for youth living in low-socioeconomic
68	areas <sup>11</sup> or in regional communities <sup>4,7</sup> . Further, intrapersonal factors (i.e. perceived skill and
69	competence), interpersonal factors (i.e. support of friends and adults), and organisational
70	factors (i.e. school and community sport club environment) were also considered important
71	influences on PA participation <sup>4, 7, 10</sup> .
72	There have been calls for longitudinal research into determinants of changes in PA in
73	order to achieve a more definitive understanding of why people are active or inactive <sup>6</sup> .
74	Longitudinal studies that examine determinants of PA participation across the
75	socioecological model are needed in order to better inform strategies to foster continued
76	participation in PA throughout adolescence <sup>4</sup> . Importantly, little is known about the changes in
77	determinants of PA during adolescence despite adolescence being recognised as a difficult
78	period of life transition.
79	This study explored patterns of change in socioecological factors hypothesised to be
80	associated with physical activity and sport across the adolescent period for females
80	associated with physical activity and sport, across the adolescent period for females.
80 81	associated with physical activity and sport, across the adolescent period for females. Methods
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80 81 82 83 84 85 86 87 88 89 90 91	associated with physical activity and sport, across the adolescent period for females. <b>Methods</b> This study is part of a larger study for which the methodological procedure has been previously outlined <sup>2</sup> . Seventeen secondary schools in the metropolitan area of Melbourne, Victoria, Australia and 14 schools in surrounding rural and regional areas participated in the study. Ethical approval was gained from the University Human Research Ethics Committees, the Victorian Department of Education and the Victorian Catholic Education Office. All female students in Years 7 and 11 from participating schools were invited to participate. There were three longitudinal waves of data collection at 12-month intervals during Autumn of 2008-2010 <sup>2</sup> . Details of the content of the following questions are shown in Tables 1 and 2, and in the Supplementary Table. In this study, the Australian Sports Commission definition of sport was adopted: "a

elements of competition where rules and patterns of behaviour governing the activity exist
formally through organisations, and is generally recognised as a sport" <sup>12</sup>. More broadly, the
contexts of leisure-time physical activity (LTPA) have been classified in terms of modes,
settings and types <sup>2</sup>. The four modes of LTPA are: team sport, individual sport, organised but
non-competitive PA; and non-organised PA.

Regarding barriers, a list of potential intrapersonal, interpersonal and
environmental/organisational barriers to PA participation was derived <sup>13, 14</sup> and participants
were asked how likely these issues would arise over the next three months on a 5-point
scale. For analysis, the responses were dichotomised to 'yes' (at least moderately likely) or
'no' (no more than slightly likely).

103 Regarding intrapersonal factors, perceived physical/sports competence was 104 assessed using items from three scales/inventories <sup>15-17</sup>. A 5-point scale was used to 105 maintain consistency with other aspects of the questionnaire, and the terms 'sport' and 'PA' 106 were used to align with the focus of this research. Self-efficacy was assessed in the second 107 and third waves of questionnaires using items on a 5-point scale regarding confidence about 108 participating in PA or sport when conditions were not ideal, adapted from Marcus and 109 Forsyth <sup>18</sup>.

Priority of PA was examined through questions on leisure preference <sup>19</sup>. Life
priorities were measured using a scale that was developed for this study which examined the
importance of eight types of activity, including PA.

113 Interpersonal factors such as support from family and friends were measured using 114 items which have demonstrated good reliability <sup>20</sup>. All family and friend items were scored on 115 a 5-point scale. The support score for each domain – family and friends – was the mean 116 score of the set of items, with high scores representing a high level of support from family or 117 friends.

118 Environmental factors were examined with questions related to an adolescent's 119 ability to access each of 14 types of PA and sport facilities and were based on those used by 120 Sallis et al. <sup>14</sup>. The 14 items were scored on a 4-point ordered scale indicating ease of access to the facility. The access score was the mean score of the 14 items, with high 121 122 scores representing greater independent access/mobility. Neighbourhood socio-economic 123 status (SES) was represented by the Socio-economic Indexes for Areas (SEIFA) Index of Relative Socio-economic Advantage and Disadvantage (IRSAD)<sup>21</sup> score for the residential 124 125 postcode of each participant.

Preliminary data screening (Eime et al.<sup>2</sup>) included ensuring that numerically coded 126 127 responses to categorical items were within the specified range, and that dates of birth and 128 self-reported heights and weights were within feasible limits. In a preliminary analysis, 129 baseline characteristics of participants who returned survey forms in all three years of the 130 study ('completers') and those who did not ('non-completers') were compared using t-tests 131 and chi-square tests. Longitudinal analysis was based on the completers. All variables 132 analysed were either quantitative (means of coded responses to a set of Likert scale items) 133 or Yes/No dichotomies (see Tables 1 and 2). Linear mixed models and longitudinal logistic regression fitted by the method of generalised estimating equations were used to identify 134 135 statistically significant differences between the two cohorts and statistically significant 136 longitudinal trends - linear and non-linear - within each cohort. Differences between cohorts 137 were assessed in 2-factor models incorporating cohort effects, time trends and cohort-time 138 interactions. Time trends were assessed in simple effects analyses, i.e. separate analyses of 139 trend for each cohort. All analyses were conducted using SPSS Version 19, with statistical 140 significance set at p<.05.

141 Results

The 2008 recruitment/response rate (the proportion of invited students who provided consent
returned the first survey form) was 19.6% with retention rates in 2009 and 2010 of 82.7% and

144	74.0%, respectively. Respondents who returned survey forms in all three waves of the study
145	comprised: Year 7 (n=328, 74.5%; aged 11-13, M±SD=12.2±0.5 years at baseline) and Year
146	11 (n=112, 25.5%; aged 16-18, 16.2±0.6 years at baseline). Details of sampling design,
147	recruitment and retention rates can be found in the supplementary material.
148	For the Year 7 cohort those who completed all three surveys ('completers') had a
149	lower mean self-reported weight at baseline (M±SD=46.6±9.3 kg; p=.009) than those who did
150	not ('non-completers': $M\pm$ SD=49.4±10.9 kg). There were no significant differences at
151	baseline in mean age, SES (SEIFA IRSAD score of residential postcode), self-reported
152	height or BMI. There were no significant differences at baseline between Year 11 completers
153	and non-completers.
154	Across both cohorts, at baseline completers were significantly more likely than
155	non-completers to report participating in PE classes at school (63.9% v 45.8%, p<.001),
156	competitive team sports outside school (64.5% v 53.7%, p=.003), or competitive individual
157	sports at school (68.6% v 55.1%, p<.001). There were no significant differences with regard
158	to participation in competitive team sports in school, competitive individual sports outside
159	school, organised but non-competitive PA or non-organised PA.
160	Tables 1 and 2 summarise the longitudinal changes within cohorts and differences
161	between cohorts for perceived socioecological barriers to regular PA participation (Table 1)
162	and socioecological factors influencing PA participation (Table 2).
163	The percentage of girls reporting barriers across the three socioecological domains
164	ranged from as few as 1% for difficulties with language to 87% for lack of time due to work or
165	study among Year 11 respondents. Around half of the barriers listed were reported
166	consistently by about 20% of respondents in both cohorts.
167	The barriers for which there were significant changes within cohorts or differences
168	between cohorts were mostly intrapersonal, including lack of energy and lack of time due to

169 other leisure activities. At baseline, lack of time due to work or study was reported by 50% of

170 the younger cohort and 80% of the older cohort. Lack of energy and lack of time both 171 trended upward in the younger cohort. Lack of energy also trended upward in the older 172 cohort. The percentages reporting lack of time were higher in the older cohort than the 173 younger cohort, though they tended to plateau (lack of time due to other leisure interests) or 174 fall after leaving school (lack of time due to study). Barriers relating to the interpersonal 175 domain showed no significant trends in either cohort and no significant differences between 176 cohorts. Within the organisational/environmental domain, items such as cultural and religious 177 beliefs and expectations and rules about clothing were all reported by relatively small 178 minorities (generally less than 10%) of respondents.

179 Among the potential socioecological determinants of PA participation, significant 180 changes or differences were observed across all three domains - especially for the Year 7 181 cohort. In terms of intrapersonal factors, perceived competence was high overall, however it 182 diminished over time in the Year 7 cohort, although the Year 11 cohort reported consistently 183 high levels. This anomaly may be due to a greater self-selection bias (i.e. more competent 184 girls being more likely to complete the survey) in the smaller Year 11 cohort compared to the 185 Year 7 cohort. Self-efficacy did not significantly change within or differ between cohorts. 186 Adolescent girls reported that they were moderately confident about participating in PA or 187 sport when conditions were not ideal.

With regard to life priorities, the perceived importance of education and study was consistently high for both cohorts, although Year 11 was significantly higher than Year 7; the importance of education peaked in the final year of school (Yr 12). There were consistent and significant increases over time in the perceived importance of boyfriends/girlfriends, parttime jobs and careers and again the importance of these activities were significantly higher for the Year 11 cohort. The importance of home and family, friends and physical activities and sport remained consistently high throughout for both cohorts.

Support from family and peers (interpersonal factors) both significantly trended
downwards from Year 7 to Year 9. Family support also dropped in Year 13 (i.e. after leaving
school). Conversely, access to facilities (environmental factors) increased steadily with
increasing age, both within and between cohorts.

199 Discussion

200 This study examined longitudinal patterns of change in intrapersonal, interpersonal and 201 environmental determinants hypothesised to be associated with participation in PA and sport, 202 across the adolescent period for two cohorts of girls. Understanding these determinants and 203 how they change across transitional periods is important to contribute to evidence-based 204 planning of public health interventions; particularly for girls who are less active than boys. 205 Key findings to emerge from this study were associated with each of the domains of the 206 socioecological model and included: intrapersonal barriers such as lack of time, lack of 207 energy and perceived competence; interpersonal factors associated with family and 208 friend/peer support; and environmental/organisational factors including access, opportunity 209 and resources. One intrapersonal factor which did not change within or between cohorts was 210 self-efficacy. Others have also found self-efficacy for PA to be stable across secondary school years <sup>22</sup>. 211

212 In this study there was a consistent trend that barriers associated with the 213 intrapersonal domain increased as females matured - both within and between cohorts -214 including 'feeling tired' or 'lacking energy', 'an inability to get going', and increasing time 215 issues associated with other leisure activities, work or study. Clearly, as adolescents mature 216 there are numerous work, study, and leisure activities that increase in priority along with time 217 allocation to these activities, leaving less time for PA opportunities. It has been reported that 218 as adolescents age their participation in PA moves away from organised, competitive 219 activities to individual-based physical activities, particularly due to increased demands of part-time employment and increasing desire to succeed educationally<sup>2</sup>. In this study, the 220

221 importance of school, work, study, relationships, and careers also significantly increased with 222 age. The importance of PA and sport, however, did not change and remained high, with 75% of respondents agreeing that it was an important activity. As Berger et al.<sup>23</sup> state, there is a 223 224 need to position PA and sport in the context of the lived experiences of adolescents of today 225 - meaning that we need to encourage adolescents to find ways to fit PA and sport into their 226 time-challenged lives. Taking a socioecological perspective, rather than an individual focus, 227 we therefore need to encourage the development in communities of physical activity options 228 that have lower time demands as a requirement for participation and greater flexibility in 229 scheduling of participation. For example, while organised sport is a popular activity among 230 children, many sports programs demand extensive and inflexible time commitments, and 231 may not be providing an environment conducive to promoting lifelong involvement in sport<sup>4</sup>. 24 232

233 Competence in sport and PA is a key determinant of participation for adolescent girls <sup>7, 25, 26</sup>. Further, perceived sport competence in childhood and adolescence has been 234 235 reported to be significantly associated with maintaining participation through the transition from adolescence to adulthood<sup>25</sup>. In this study, perceived competence declined for the Year 236 237 7 cohort over time, although not for the older cohort. This may be a consequence of self-238 selection bias in the older cohort, or it may be related to maturation in the younger cohort. 239 Others have reported similar findings, whereby maturation status (i.e. progression towards the adult state) was inversely related to perceptions of sport competence <sup>26</sup>. Interventions 240 241 that focus on developing perceived sport competence throughout adolescence, therefore, may be important for promoting lifelong PA participation <sup>25</sup>. 242

It is well established that support from family and peers is important for adolescent PA and sport participation <sup>27, 28</sup>. Parental support has been shown to be a strong mediator for sport club participation among girls from low socio-economic areas <sup>29</sup>. Similarly, peer encouragement is important for participation in PA after school, especially for girls after the transition from primary to secondary school <sup>28</sup>. In this study, reported family support – via

encouragement, praise, watching/supervision, or direct involvement in PA – decreased over
time; particularly for the Year 7 cohort. Strategies to promote and maintain family support for
PA for adolescent girls are required, especially since girls appear to receive less

encouragement to be active from their parents than do boys  $^{30}$ .

252 Peer support was significantly higher among the younger cohort compared to the 253 older cohort. Peer teasing can diminish peer support for, and enjoyment of, PA, and is a particular issue in the school environment<sup>7</sup>; and is also present in community environments 254 255 such as organised sport <sup>31</sup>. Considering the decline in peer support reported in this study 256 and evidence of peer teasing in schools and sports clubs, there is a need to promote more 257 positive and inclusive environments for PA and sport participation to promote lifelong PA 258 participation. Stafford et al <sup>31</sup> suggest that children should be involved fully in the decisions 259 about their sporting lives, and participate in an environment where they feel empowered to 260 have a voice for the context of participation, where it is safe, fun and carefree.

261 The access to facilities score significantly increased within each cohort over time 262 and between cohorts, indicating that access to PA opportunities increased steadily 263 throughout adolescence. Other evidence suggests that a greater number of available PA facilities is associated with increased PA levels <sup>32</sup>. More specifically, access to facilities along 264 265 with family support have been found to be strong mediators specifically between the association between socio-economic status (SES) and club sport participation<sup>29</sup>. Studies 266 267 have also reported that for adolescents, the number of nearby facilities and number of 268 nearby parks correlates positively with their PA<sup>33</sup>. This is supported by Scott et al.<sup>34</sup> who 269 states that both the individual facility perceptions and the total number of facilities perceived 270 was associated with increased PA for adolescent females. Our study showed that as girls 271 aged fewer perceived that there was a lack of opportunity or resources for PA. This was in 272 contrast to a cross-sectional study in the United States that reported that as young people 273 aged (from Grade 7 to University freshman) they were more likely to identify a lack of 274 community opportunities (e.g. lack of specific sports team to join/participate in) and

275 resources (lack of facilities/variety of facilities) for PA <sup>35</sup>. This difference may be due to the
276 dominance of the club sport system in Australia compared to the United States.

277 A major strength of this study was its prospective holistic design, which allowed 278 changes in the determinants of participation to be assessed longitudinally across the 279 socioecological domains over a three-year period in two cohorts of adolescents. While the 280 information about determinants was based on subjective self-report, in most instances this 281 was unavoidable, and generally, we used established measures of these constructs. As has 282 been pointed out elsewhere 36. It is acknowledged that while the study investigated access 283 to a wide range of PA and sport facilities, it did not examine other aspects of the environment 284 such as aesthetics, road and personal safety, walkability and quality of facilities. Studies of 285 this population are difficult to conduct due to the ethical requirements of Australian education 286 authorities to obtain specific 'opt-in' parental consent, which is exacerbated by the necessity 287 to communicate with parents only indirectly in writing via the school and the students 288 themselves. Consequently, participant recruitment rates were low - meaning that there is a 289 possibility that students and/or parents with more interest in PA were more likely to have 290 volunteered and/or given consent to participate in the study 2, which may underestimate the 291 barriers to participation. Comparison of the baseline characteristics of those who completed 292 all three surveys and those who did not indicates a degree of self-selection bias towards girls 293 with a greater competitive sport focus. A further limitation which has implications for 294 interpretation of the results is that, because the sample size in the Year 11 cohort was much 295 smaller than that in the Year 7 cohort, larger effect sizes (bigger differences or stronger 296 trends) were required in order to establish statistical significance in the smaller sample.

297 Conclusion

298 This study has identified significant and interrelated patterns of change in intrapersonal,

299 interpersonal and environmental determinants of participation in PA by girls across the

- 300 adolescent period. In summary, intrapersonal barriers such as lack of time and lack of energy
- 301 increased over a 3-year period for both cohorts, which were influenced by the increasing

302	importance of education, work and career. Therefore, flexibility in the structure and
303	scheduling of PA opportunities is likely to be an important consideration in order to retain
304	older adolescents in PA and sport. Perceived competence also significantly decreased from
305	Year 7 to 9, highlighting the need to continue to develop competency into the secondary
306	school years. In terms of interpersonal factors, support from both family and friend/peers
307	decreased, although only significantly so between Year 7 and 9. Strategies are required to
308	promote family support for girls' PA along with strategies for fostering peer support and
309	encouraging supportive and inclusive environments. Finally, reported access to a range of
310	PA facilities was quite high and increased significantly over time within both cohorts.
311	Practical Implications
312	Position PA and sport in the context of the lived experiences of adolescents of today
313	using individual and organisational strategies to encourage and support adolescents
314	to find ways to fit PA and sport into their time-challenged lives.
315	Interventions that focus on developing perceived sport competence throughout
316	adolescence may be important for promoting lifelong PA participation.
317	• Promote and maintain family support for adolescent girls to be active.
318	Create and promote positive and inclusive environments for PA and sport.
319	
320	Acknowledgements
321	The authors would like to thank the participating schools and students.
322	This study was funded by Sport and Recreation Victoria, a division of the Department of
323	Transport, Planning and Local Infrastructure, Victorian Health Promotion Foundation
324	(VicHealth), Victoria University and Federation University, Australia. $X$ is supported by a
325	VicHealth Research Practice Fellowship- Physical Activity.

### 326 Table 1: Longitudinal changes within cohorts and differences between cohorts for perceived barriers to regular participation in PA (including sport)

			Cohort, calendar year and school year level Sta											Statist signifi	ically icant	
			Year 7 (n=328) Year 11 (n=112)									difference				
				2009	2010	Statistically significant trend			2008	2009	2010	Statistically significant trend			between cohorts <sup>,</sup>	
Barrier	Dichotom	y Variable	Yr 7	Yr 8	Yr 9	p-value	Туре	Sign <sup>1</sup>	Yr 11	Yr 12	Yr 13	p-value	Туре	Sign <sup>1</sup>	p- value	Sign <sup>2</sup>
Intrapersonal barriers Self-consciousness about my looks when I exercise	Yes/No	% Yes	25	23	28	0			28	16	19	)				
Feeling tired or lacking energy	Yes/No	% Yes	33	37	42	.029 L	inear	+	37	48	52	.011 l	inear	+	.047	+
Lack of time due to other leisure activities (e.g.	Yes/No	% Yes	36	45	55	L 001	inear.	+	55	55	57				.006	+
Lacking time due to work or study	Yes/No	% Yes	50	52	62	< .001 .001 I	inear	+	80	87	75	.042 (	Duadratic	+ -	< .001	+
Not having enough skills in physical activities	Yes/No	% Yes	24	25	25	.0011	intotal	·	27	26	20	)	20001010		1.001	
Not being fit or strong enough	Yes/No	% Yes	23	26	29				37	32	28	}				
Difficulties in organising equipment or facilities	Yes/No	% Yes	25	21	22				30	17	18	.020 l	inear	-		
Fear of injury	Yes/No	% Yes	21	19	17				17	12	12					
Inability to get myself going	Yes/No	% Yes	24	27	28				39	40	43				< .001	+
Having injury, disability or illnesses	Yes/No	% Yes	22	21	20				21	16	22	2				
Difficulties with language (e.g. do not understand English well enough)	Yes/No	% Yes	4	4	6				1	1	1				.037	-
Interpersonal barriers																
Difficulty finding someone to participate with	Yes/No	% Yes	21	20	27				20	19	28	1				
Difficulties in organising friends or other people to participate	Yes/No	% Yes	27	27	26				29	27	27					
Organisational/environmental barriers		_														
Conflict with cultural expectations or beliefs	Yes/No	% Yes	12	8	6	.015 L	inear	-	2	3	2	2			.003	-
Lack of opportunity or resources (e.g. lack of	Yes/No	% Yes	21	17	16				14	15	12	!				
Rules about boys and girls playing together	Yes/No	% Yes	15	16	15				10	6	5				.001	-
Cost of participation (e.g. buying equipment, hiring facilities)	Yes/No	% Yes	28	27	28				25	21	33					
Conflict with religious rules, beliefs or expectations	Yes/No	% Yes	8	6	7				1	1	1				.005	-
Unpleasant weather (e.g. hot, cold, rainy)	Yes/No	% Yes	31	33	36				33	37	45	i				
Conflict with rules about clothes that should be worn	Yes/No	% Yes	17	13	13				7	4	2				< .001	

327 <sup>1</sup> Signs indicate direction of linear trend and pattern of quadratic curvature superimposed on linear trend. <sup>2</sup> Signs indicate the direction of difference of Year 11 relative to Year 7.

#### Table 2: Longitudinal changes within cohorts and differences between cohorts in the intrapersonal, interpersonal and

329 organisational/environmental factors influencing participation in PA (including sport) and in PA levels

			Cohort, calendar year and school year level									Statisti signifi	cally cant			
			Year 7	(n=327)		Year 11 (n=113)						difference				
	Measure		2008	2009	2010	Statistically signif trend	cant 200	2008	2009 Yr 12	2010 Yr 13	Statistically significant trend			between cohorts <sup>,</sup>		
Factor	or dichotomy	, Variable	Yr 7	Yr 8	Yr 9	p-value Type	Sign <sup>1</sup>	Yr 11			p-value	Туре	Sign <sup>1</sup>	p- value	Sign <sup>2</sup>	
Intrapersonal factors																
Perceived competence	Scale (1-5)	Mean	3.9	3.87	3.75	< .001 Linear	-	3.83	3.97	3.81						
Self-efficacy <sup>3</sup>	Scale (1-5)	Mean		2.85	2.87				2.72	2.72						
Importance of activities:																
Schoolwork/education/study	Yes/No	% Yes	86	89	89			95	99	95	.045 0	Quadratic	+ -	< .001		
Friends	Yes/No	% Yes	90	99	94	< .001 Quadratic	+ -	95	98	96	)					
Boyfriend/girlfriend	Yes/No	% Yes	28	42	43	< .001 Linear/	+	35	49	55	L	inear		.030	+	
						.025 quadratic	+ -				< .001					
Part-time job	Yes/No	% Yes	40	48	55	Linear	+	53	46	75	< .001 L	inear/	+	.008	+	
Career	Ves/No	% Ves	61	67	71	< .001 002 Linear	+	81	84	84	< .001 C	uadratic		< 001	+	
Community service (volunteering)	Yes/No	% Yes	29	29	24	.002 Linear	т	26	29	32	0191	inear	+	< .001	т	
Home and family	Yes/No	% Yes	92	97	91	001 Quadratic	+ -	91	97	94	.0171	incui				
Physical activities and sport	Yes/No	% Yes	79	84	76	.003 Quadratic	+ -	79	77	75						
Interpersonal factors																
Family support	Scale (1 E)	Moon	2.07	2 0 2	2 4 7	001 Lincor/		2 0 7	2 07	2 71	0100 1	incor				
	Scale (1-5)	INEGII	3.97	3.92	3.07	<ul> <li>001 Lilledi/</li> <li>001 quadratic</li> </ul>	-	3.07	3.07	3.71	.0190 L	liieai	-			
Friend support	Scale (1-5)	Mean	3.65	3.67	3.51	.004 Linear/	-	3.58	3.42	3.45				.008	-	
						.003 quadratic	+ -									
Organisational/environmental factors																
Access to facilities	Scale (1-4)	Mean	3.08	3.24	3.31	< .001 Linear	+	3.33	3.43	3.50	<.001 I	inear	+	< 001	+	
		moun	0.00	0.21	0.01	Quadratic	+-	0.00	0.10	0.00			·		•	

330 <sup>1</sup> Signs indicate direction of linear trend and pattern of quadratic curvature superimposed on linear trend. <sup>2</sup> Signs indicate the direction of difference of Year 11 relative to Year 7. <sup>3</sup> The self-efficacy question was not

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