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**Social physique anxiety and physical activity in early adolescent girls:  
The influence of maturation and physical activity motives.**

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## Abstract

This study considered the influence of maturation on social physique anxiety (SPA), the relationship between SPA and current and future physical activity (PA) levels and the influence of motives for physical activity on this relationship in early adolescent girls (n=162; mean age=11.80±0.33 years). Participants completed the Pubertal Development Scale, the modified Social Physique Anxiety Scale and the Motives for Physical Activity Scale at baseline and the Physical Activity Questionnaire for Older Children at baseline and 6 months later. The girls became less active across the 6 months and girls in the early stages of maturation had significantly lower SPA than the girls in the middle and late stages of maturation. SPA was not related to current or future physical activity in the sample as a whole. Cluster analysis identified four groups with different motive profiles and the High Appearance and Fitness group demonstrated a moderate negative relationship between SPA and PA at phase 1, whereas the other groups did not. These findings indicate that SPA may increase with maturation and the relationship between SPA and PA is dependent on reasons for being active. For girls who are motivated to be active primarily by body-related reasons SPA is likely to lead to lower levels of PA.

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Social physique anxiety and physical activity in early adolescent girls: The influence of maturation and physical activity motives.

Physical activity refers to any force exerted by skeletal muscle that results in energy expenditure above resting level, and includes a range of activities including sport, exercise and activities for daily living (Caspersen, Powell & Chistenson, 1995). For health, children and young people should achieve at least 60 minutes of moderate intensity activity each day, and twice a week this should include activities for bone health, muscle strength and flexibility (Department of Health, 2004). In girls, physical activity drops considerably from age 10-15 years, and this decrease in activity appears to track into adulthood (Gordon-Larsen, Nelson & Popkin, 2004). The consequences of inactivity on chronic disease are evident throughout the life stages (Department of Health, 2004), therefore it is important to understand why there is a decrease in physical activity as girls become older so that appropriate interventions can be developed to prevent this decrease in adolescent girls. Research to date indicates that there are multiple reasons why girls are inactive including lack of time, involvement in other activities, peer and environmental influences, and psychological influences such as lack of perceived competence and body-related concerns (Biddle, Whitehead, Donovan, & Nevill, 2005).

Self-presentation refers to the processes people use to monitor and control how they are perceived by other people, and has previously been shown to influence health behaviour in adolescence (Martin, Leary & O'Brien, 2001). Generally, individuals want to be perceived by others in a favourable manner and therefore aim to convey a positive image (Leary, 1992). If individuals are concerned about being perceived as

1  
2 uncoordinated, overweight or unfit when being physically active then they may avoid  
3 such situations (Hausenblas, Brewer & Van Raalte., 2004; Leary, 1992). The majority of  
4 research examining the relationship between self-presentation and exercise behaviour has  
5 focused on social physique anxiety in adults (Hausenblas et al, 2004). Social physique  
6 anxiety (SPA) is the anxiety that results from 'the prospect or presence of interpersonal  
7 evaluation involving one's physique' (Hart, Leary & Rejeski, 1989, p. 96).  
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11 For adolescent girls specifically, self-presentation concerns may be pertinent in  
12 understanding changing physical activity behaviour because the physical changes  
13 associated with maturation that occur during this time are likely to lead to increased self-  
14 presentation concerns. These physical changes include development of secondary sex  
15 characteristics and an increase in adiposity from approximately 15% to 22% body fat that  
16 is not matched by an increase in lean body mass (Malina, Bouchard & Bar-Or, 2004).  
17 These changes lead to power to weight ratios that are generally opposed to competence in  
18 athletic events and participation in traditional forms of school and community based  
19 physical activities. Consequently, it is not surprising that as girls mature they may  
20 become more concerned about presenting themselves in a physical environment  
21 (Thompson & Chad, 2000; Monsma, Malina & Feltz, 2006). For example, concern about  
22 wearing a swimsuit and displaying one's body can be a barrier to swimming for  
23 adolescent girls (Eklund & Bianco, 2000; James, 2000).  
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40 In a review, Hausenblas et al (2004) reported that most adult studies found a small  
41 negative relationship between SPA and exercise behaviour specifically, indicating that  
42 SPA may be a barrier to being active through formal exercise. However, some studies  
43 reported no relationship between SPA and amount of exercise in women (Crawford &  
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2 Eklund, 1994), or even that women with high SPA exercised more so than those with low  
3 SPA (Frederick & Morrison, 1996). There has been limited research examining the  
4 SPA-exercise relationship specifically with adolescent girls. An exception is a 3 year  
5 longitudinal study conducted by Crocker, Sabiston, Kowalski, McDonogh and Kowalski  
6 (2006) who examined the relationship between SPA and a measure of physical activity,  
7 which assesses general levels of physical activity during the school year. SPA was not  
8 correlated with physical activity at Year 1 when the sample was 14-15 years old, but a  
9 negative relationship was significant at Years 2 and 3. This finding suggests that higher  
10 SPA is related to lower activity levels as girls become older, although it should be noted  
11 that the strength of the identified relationships was small (i.e.,  $r=-.09$  and  $r=-.16$ , Years 2  
12 and 3 respectively).

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The inconsistent research findings on the relationship between SPA and exercise and physical activity may partly be because high levels of SPA can influence individuals' behaviour in different ways. High SPA may lead an individual to avoid situations where one's body will be on display, or alternatively result in the individual becoming more active as a remedial action to improve one's appearance (Hart et al., 1989). Therefore, for some adolescent girls high SPA may lead to increased physical activity but for others it may lead to lower levels of physical activity (Eklund & Bianco, 2000), indicating that the relationship between SPA and physical activity may not be linear. Consequently, Hausenblas et al. (2004) suggested that future research should consider the influence of other variables on this relationship between SPA and physical activity.

The reasons why girls choose to be active are diverse and may influence the relationship between physical activity and SPA. Drawing from Self-Determination

1  
2 Theory (Deci & Ryan, 1985, 1991) several researchers have identified that the reasons  
3 why individuals chose to be active can be divided into motives that are either intrinsic or  
4 extrinsic in nature. Intrinsically motivated individuals engage in an activity for the  
5 satisfaction they gain from the activity itself and Ryan, Frederick, Lipes, Rubio and  
6 Sheldon (1997) suggested that intrinsic motives for physical activity include motives  
7 related to enjoyment and competence. Extrinsically motivated individuals engage in an  
8 activity in order to obtain rewards or outcomes that are separate from the behaviour itself.  
9 In relation to physical activity, being motivated to improve one's appearance or fitness, or  
10 for social reasons have been identified as extrinsic motives (Frederick & Morrison, 1996;  
11 Ryan et al., 1997). Being extrinsically or intrinsically motivated to be active can lead to  
12 different cognitive, emotional and behavioural outcomes. Specifically intrinsic motives  
13 have been associated with greater exercise adherence and enjoyment (Ryan, et al, 1997),  
14 and lower SPA (Frederick & Morrison, 1996) than extrinsic motives. It is possible that  
15 the reasons why girls choose to be active may affect the relationship between SPA and  
16 physical activity. Specifically, for intrinsically motivated individuals high SPA may not  
17 act as a barrier to being active because the focus on enjoyment and competence may  
18 over-ride these concerns. In contrast, individuals who are motivated to be active for  
19 appearance and fitness reasons may be prevented from being active by high SPA because  
20 their body related concerns are dominant. Considering the influence of motives for  
21 physical activity may provide further insight into the complex relationship evident  
22 between SPA and physical activity.  
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45 The aim of this research was threefold; firstly to consider the influence of  
46 maturation on SPA and it was hypothesised that more mature girls would have greater  
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SPA; secondly to examine the relationship between SPA and current and future physical activity in early adolescent girls; and thirdly to consider the influence of motives on the relationship between SPA and physical activity.

## Method

### *Participants*

Data were collected from 204 girls in their final year of elementary school from 17 local schools and at 6-months, 162 girls were tracked to their six new high schools and participated in the follow-up data collection of physical activity levels, and were therefore included in this study (mean age at phase 1 = 11.80±0.33 years). Non-participation in phase 2 was due to moving to a high school not included in the follow-up sample (n=31) or being absent on the data collection day (n=11), representing a 20% drop-out. There were no significant differences across any of the variables in the Phase 1 data between the girls who participated in Phase 2 and those who did not. Of the 162 girls, 95% classified themselves as White British and using the Family Affluence Scale (Currie, Elton, Todd & Platt, 1997) to assess socio-economic status, 76.5% were classified as low affluence, 19.8% as medium affluence and 3.7% as high affluence. All girls and parents/guardians gave written informed consent and the institutional ethics committee approved the project.

### *Measures*

*Physical activity.* physical activity was assessed using the self-report Physical Activity Questionnaire for Older Children (PAQ-C; Crocker, Bailey, Faulkner, Kowalski & McGrath, 1997). The PAQ-C is a 7-day recall instrument developed to assess general levels of physical activity during school term time and provides a summary physical



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2 activity score derived from nine items relating to specific spare time activities, level of  
3 activity throughout the school day, after school, at weekends, and activity level on each  
4 day of the week. From the nine items a measure of physical activity is calculated on the  
5 scale of 1-5 (1 = little or no activity and 5 = very high levels of activity). Strengths of the  
6 PAQ-C are that it uses memory cues to stimulate accurate recall, provides a general  
7 measure of physical activity, and has established reliability and validity from several  
8 studies (Crocker *et al.*, 1997; Kowalski, Crocker, & Faulkner, 1997; Kowalski, Crocker,  
9 & Kowalski, 1997).

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21 *Maturation.* Maturation was self-assessed using the self-report Pubertal  
22 Development Scale (PDS; Peterson et al 1988), which has established reliability and  
23 validity. This is a five-item questionnaire that asks the girls to rate their development.  
24 An overall pubertal score was calculated as a mean of the five items and was used to  
25 generate a three stage score of maturation, where a mean score of less than 2 suggested  
26 that the girl was showing no or only early signs of maturation, a mean score between 2  
27 and 3 as suggesting that the girl was mid way through the maturation process, and a mean  
28 score greater than 3 suggesting the girls were in the late stages of, or had completed the  
29 maturation process. The internal reliability of the PDS was good ( $\alpha = .73$ )

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*Social Physique Anxiety.* Social physique anxiety was assessed using a modified  
version of the Hart et al's (1989) 12-item Social Physique Anxiety Scale (SPAS).  
Consistent with Smith's (2004) recommendations for using the SPAS as a uni-  
dimensional measure and with young adolescents, a 9-item measure was used that  
excluded items 1, 2, and 5 and modified item 7 to replace the word 'apprehensive' with  
'uncomfortable'. The items are scored on a 5-point Likert scale and a higher score

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2 indicates a greater level of social physique anxiety. The internal reliability of the revised  
3 SPAS was acceptable ( $\alpha = .78$ ).  
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6 *Motives for Physical Activity.* Motives for physical activity were assessed using  
7 the revised Motivation for Physical Activity Measure (MPAM-R; Ryan, et al., 1997).  
8 The MPAM-R is a 30-item questionnaire that assesses the strength of five general  
9 motives for participation in physical activity; enjoyment, competence, appearance, fitness  
10 and social. Participants respond to the items on a 7-point Likert scale. The internal  
11 reliability of the subscales were all acceptable (i.e., enjoyment  $\alpha = .88$ ; competence  $\alpha =$   
12 .87; appearance  $\alpha = .88$ ; fitness  $\alpha = .83$ ; social  $\alpha = .75$ )  
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#### 20 *Procedure*

21 The researchers met with each class at least 2-weeks prior to data collection in  
22 order to introduce the research project and staff. All girls completed the questionnaire in  
23 a group classroom setting and the questionnaire was split into sections so that a full  
24 explanation for each section could be provided and to allow a break between  
25 questionnaires. At follow-up the girls again completed the PAQ-C in a class-room  
26 setting.  
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#### 35 *Data Analysis*

36 All data were double inputted into SPSS version 12 (SPSS Inc., Chicago, IL,  
37 USA Version 12). The data were subsequently screened and checked for inconsistencies  
38 between the two entries. Prior to further analyses the data were tested for the  
39 assumptions of parametric tests and several variables exhibited moderate negative  
40 (motives for interest and enjoyment, competence and fitness) and positive (PAQ-C phase  
41 2) skewness. Transformations did not resolve these issues so non-parametric tests were  
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2 used (Field, 2005). Descriptive statistics were determined for each of the variables and a  
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4 Wilcoxon signed ranks test was used to examine changes in physical activity from phase  
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6 1 to phase 2. A Kruskal Wallis was used to examine differences in maturation groups on  
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8 SPA, and differences between groups were identified using Mann Whitney with a  
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10 Bonferroni correction. Spearman correlations were used to examine the relationship  
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12 between SPA and physical activity at phases 1 and 2 on the whole sample. A non-  
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14 hierarchical K-means clustering procedure (Quick Cluster; SPSS) was used to classify  
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16 participants into similar motive profiles based on their scores on the five motives sub-  
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18 scales. Cluster analysis aims to identify patterns in the data and classify respondents into  
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20 groups to maximize internal homogeneity and external heterogeneity (Hair, Black, Babin,  
21  
22 Anderson & Tatham, 2006). Results for three, four and five cluster solutions were  
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24 examined for conceptual insight. Stability of the selected solution was assessed by  
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26 randomly splitting the sample in half and re-clustering the data, and by using discriminant  
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28 function analysis. A multivariate analysis of variance with follow-up univariate analyses  
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30 were used to confirm whether the clusters differed significantly on each of the variables  
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32 included in the cluster analysis. Further, Spearman correlations were used to examine  
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34 the relationship between SPA and physical activity for the resultant clusters.  
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## 36 37 Results

### 38 39 *Physical Activity*

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41 There was a significant decrease in physical activity from an average of 3.02  
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43 (S.D. = 0.7) at phase 1 to an average of 2.65 (S.D. = 0.6) at phase 2 (T=2152; p<.01) and  
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45 the effect size was large (r=-0.58).  
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### *Influence of maturation on SPA*

The more mature girls exhibited higher scores on SPA ( $H(2) = 11.18; p < .01$ ) (see Table 1). Specifically, at phase 1 the girls classified as early maturers had significantly lower SPA than the girls in mid ( $U = 1673; p < .017; r = 0.24$ ) and late maturation ( $U = 461; p < .017; r = .25$ ) groups, and the effect sizes were small to medium.

\*\*\*Table 1 here\*\*\*

### *Relationship between SPA and physical activity for all participants*

Spearman correlations indicated that there was no significant relationship between SPA at phase 1, and physical activity at phase 1 ( $r_s = -.10; p > .05$ ) or phase 2 ( $r_s = -.14; p > .05$ ) for all participants and the coefficients were small.

### *Cluster analysis of motives*

A four cluster solution was selected because it provided conceptually interesting groups for comparison (i.e., groups were relatively distinct in the pattern of motives) and retained acceptable participant numbers for subsequent analysis. The solution exhibited good stability with 93.7% of the data re-clustered into the correct groups when randomly split in half. Further, discriminant function analysis assigned 97% of cases to the correct grouping. A MANOVA with appropriate follow-up univariate analyses indicated that each cluster was significantly different from the other clusters on each of the motives. Table 2 shows the resultant four clusters and the mean and standard deviation scores for each motive type.

\*\*\*Table 2 here\*\*\*

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*Relationship between SPA and physical activity for each cluster*

The relationship between SPA and physical activity differed across the clusters. The cluster labelled High Appearance and Fitness had a moderate to large significant negative relationship between SPA and physical activity at phase 1 ( $r_s = -.47$ ;  $p < .05$ ) and a moderate but non significant relationship between SPA and physical activity at phase 2 ( $r_s = -.38$ ). The cluster labelled Low Appearance showed no significant relationship between SPA and physical activity at phase 1 ( $r = -.23$ ) or phase 2 ( $r = -.25$ ). The High All cluster exhibited no significant relationship between SPA and physical activity at phase 1 ( $r = .10$ ) or phase 2 ( $r = -.12$ ), and the cluster labelled Low All exhibited no significant relationship between SPA and physical activity at phase 1 ( $r = .04$ ) or phase 2 ( $r = .20$ ).

**Discussion**

Research consistently shows that girls become less active from early to late adolescence and physical activity levels do not recover into adulthood. The onset of maturation and the increased salience of self-presentation concerns may partly explain this change in behaviour. The aim of this study with early adolescent girls was to consider the influence of maturation on SPA, examine the relationship between SPA and physical activity and consider the role of motives on this relationship.

The girls became less active over the six month period of the study as they progressed from elementary to secondary school. This finding is consistent with other research (e.g., Bromley, Sproston, & Shelton, 2005) and supports the contention that early adolescent girls get less active as they get older. It should be noted that because this

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2 data was collected over a 6-month period then seasonal factors may influence the levels  
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4 of physical activity.  
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6 Supporting the hypothesis, there was evidence that maturation could influence  
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8 SPA with girls in the early stages of maturation exhibiting lower SPA than girls in the  
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10 mid and late stages. Although this data is cross-sectional, the finding is consistent with  
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12 previous research (Thompson & Chad, 2000) and indicates that as girls mature they  
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14 become more concerned about real or perceived evaluation of their bodies by others. It is  
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16 likely that this increased concern with maturation is related to body changes, such as  
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18 breast development and increased body fat. Indeed, a number of studies have shown a  
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20 consistent negative relationship between SPA and body size (Crocker et al., 2006;  
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22 Sabiston, Crocker & Munroe-Chandler, 2005). Previous research has shown that SPA is  
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24 related to a number of health variables such as lowered self-esteem (Davison & McCabe,  
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26 2006) and risk of developing an eating disorder (Thompson & Chad, 2002), so  
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28 intervention studies aiming to decrease SPA and promote positive body perceptions  
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30 would be of value.  
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33 Within the whole sample, SPA was not related to current physical activity or  
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35 physical activity levels 6 months later suggesting that concerns about displaying one's  
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37 body were not an immediate or future deterrent to being active for this group as a whole.  
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39 This finding is consistent with Crocker et al's (2006) findings with 14-15 year old girls.  
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41 Crocker et al. did report that there was a small significant negative relationship between  
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43 SPA and physical activity as the girls get older, suggesting that the direct influence of  
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45 SPA on physical activity behaviour may emerge later in this sample. These findings also  
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47 support some adult studies that did not find a relationship between SPA and physical  
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2 activity (e.g., Crawford & Eklund, 1994), but are inconsistent with other studies that have  
3 shown evidence of a small negative relationship (Hausenblas et al., 2004) or even a  
4 positive relationship between SPA and exercise behaviour (Frederick & Morrison, 1996).  
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9 The non-significant relationship evident between SPA and physical activity may  
10 be due to the differential influence of SPA on different girls. Specifically, SPA may act  
11 as a barrier to activity or actually encourage individuals to be active, so this study aimed  
12 to consider the influence of motives for physical activity on the relationship. Cluster  
13 analysis identified four groups that differed on their pattern of motives. Specifically, the  
14 All High group included girls who were strongly motivated for both intrinsic and  
15 extrinsic reasons. The All Low group included girls who scored low on each of the  
16 motive types, suggesting low levels of motivation for physical activity. A third group  
17 Low Appearance was the largest group and included girls who scored high on all of the  
18 intrinsic motives and extrinsic motives with the exception of appearance related reasons,  
19 suggesting that improving their body was not a salient reason for being active. Finally,  
20 the fourth group was labelled High Appearance and Fitness because it included girls who  
21 scored high on the extrinsic motives of appearance and fitness, but low on social motives  
22 and the intrinsic motives of interest and enjoyment, and competence. The High  
23 Appearance and Fitness group was the only group that demonstrated a significant  
24 relationship between SPA and physical activity, and a strong negative relationship  
25 between SPA and current physical activity and physical activity at six-months was  
26 evident, although the relationship at six-months was not significant possibly due to the  
27 sample size. There were no significant relationships between SPA and physical activity  
28 for the other three groups and the strength of the relationships were considerably smaller  
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( $<.26$ ). ~~Therefore, these~~ findings indicate that SPA may be a barrier to being active for early adolescent girls who are strongly motivated by reasons related to their body, and not by intrinsic related reasons. ~~However, SPA does not appear to be negatively related to physical activity behaviour for girls who are not particularly motivated, girls who are not motivated by appearance reasons, and for girls who have strong appearance and fitness motives but also strong intrinsic motives to be active. It is possible that if girls are motivated by extrinsic appearance and fitness related reasons, then also being intrinsically motivated to be active can have a protective influence on the negative effects of SPA on activity levels.~~

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**Deleted:** are not predominantly motivated by body-related motives. ¶

Although further replication is required, these findings suggest that SPA can have a differential influence on physical activity behaviour, and having high SPA and being motivated primarily for appearance and fitness related reasons is likely to lead to lower levels of physical activity. This is particularly of interest as previous research has indicated that individuals with high SPA are more likely to be motivated for extrinsic reasons related to their appearance (Eklund & Crawford, 1994; Frederick & Morrison, 1996). It is possible that with maturity related increases in SPA, girls may become more focused on appearance related reasons to be active. Consequently a vicious circle may develop whereby having high SPA could prompt an individual to be motivated to improve their physique, but these motives are actually less likely to lead to long term adherence to physical activity. Further research would be of value to examine changes in SPA and motive profiles and its effect on the SPA-physical activity relationship as the girls mature. These findings also indicate that examining the relationship between SPA



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2 and physical activity in a group as a whole may mask the differential influence and  
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4 further research should consider the influence of motives on this relationship.  
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6 Much adult research examining the influence of SPA on physical activity  
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8 behaviour has focused on the relationship between SPA and structured exercise frequency  
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10 (e.g., Frederick & Morrison, 1996), whereas studies with adolescent girls have focused on  
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12 general physical activity behaviour. General physical activity behaviour is typically  
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14 assessed as a composite of a number of activities (Crocker et al., 1997), some of which  
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16 may be more likely to create self-presentation concerns (e.g., swimming) than others  
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18 (e.g., skateboarding). Consequently, a general measure of physical activity may not  
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20 provide the full picture and future research with adolescent girls could examine the  
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22 influence of SPA on different activities and exercise behaviour specifically.  
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25 In summary, this study adds support to the well-documented decrease in physical  
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27 activity early adolescent girls. Further, in this sample more mature girls had higher SPA  
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29 suggesting that as girls mature SPA increases. Additionally, for girls who are motivated  
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31 primarily for body-related reasons, high levels of SPA are likely to lead to low levels of  
32  
33 physical activity. For girls who are not predominately motivated to be active for body-  
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35 related reasons then SPA will have limited influence on physical activity behaviour.  
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37 Future research examining the relationship between SPA and physical activity should  
38  
39 consider the influence of motives in understanding this relationship. Future intervention  
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41 research may consider how girls with high SPA can be introduced to activities that will  
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43 foster the development of more intrinsic motives.  
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Table 1: Mean and Standard Deviation Scores for the Social Physical Anxiety Scale by

## Maturation Stage

Measure	Maturation Stage			
	Early (n= 82)	Mid (n=57)	Late (n=18)	Total (n = 157)
Social Physique Anxiety Scale (max = 45)	23.16 (6.0)	26.26* (7.2)	27.39* (6.4)	24.77 (6.7)

\* significantly different from Early stage ( $p < .05$ )

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Table 2: Mean and standard deviation scores on motive type for four emergent clusters

Motive Type	Cluster			
	1 Low Appearance (n=62)	2 High All (n=44)	3 High Appearance & Fitness (n=23)	4 Low All (n=33)
Interest & Enjoy't	5.43 (0.78)	6.02 (0.64)	3.37 (1.14)	4.14 (0.99)
Competence	5.20 (0.73)	5.86 (0.74)	3.19 (1.12)	3.62 (0.81)
Appearance	3.33 (1.06)	5.62 (0.79)	5.46 (0.83)	2.31 (0.79)
Fitness	5.25 (0.89)	6.31 (0.56)	5.19 (1.09)	3.73 (0.80)
Social	4.05 (0.95)	5.23 (0.83)	3.00 (0.94)	2.86 (0.84)