

NRG2

YOUTH DANCE & HEALTH



BRITISH
MUSIC
LABAN
DANCE



hampshire dance



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1 EXECUTIVE SUMMARY

With health issues still very much a national concern for young people, Hampshire Dance and Trinity Laban devised the NRG2 project in order to further extend previous investigations into the health benefits of dance. NRG2 set out to explore the health improvements previously found in the NRG (Quin et al, 2007) project among young people and in particular, the different impact dance can have on males versus females.

The research aim of the NRG2 project was to assess the impact of gender specific creative dance classes on areas of physical fitness, health and wellbeing in young people. To provide a wide geographical base for research in this field, NRG2 was delivered in West Sussex rather than Hampshire in this instance. As with the first NRG project, NRG2 provided an opportunity for participants to experience and enjoy dance as both a creative art form and a physical activity, whilst potentially impacting positively on their health and wellbeing. A team from the Dance Science department at Trinity Laban assessed the young people at the beginning and at the end of the programme. In addition, a follow-up assessment was carried out three months after the end of the classes.

The findings of NRG2 were that the physical and psychological well-being of the female participants improved after the 10-week period while no change was found for male participants. In the analysis, the young people were separated into four groups: girls in the dance intervention group, boys in the dance intervention group, girls in the control group and boys in the control group. It was found that, specifically, girls who participated in the dance classes improved their aerobic capacity and flexibility. In terms of psychological well-being, the girls also felt significantly more competent and related to their peers than any other groups in this study following the dance intervention. The results from the project showed significant differences between male and female's response to creative dance. These differences need further investigation in terms of how dance and health projects might be best delivered. The control group provided further scientific grounding to the study.

2 BACKGROUND AND CONTEXT

2.1 NRG Youth Dance and Health

In 2005-6 Hampshire Dance and Trinity Laban had first carried out a pioneering research project to assess the effects of a creative dance programme on the physiological and psychological health and wellbeing of school children aged 11-14 years. NRG involved 348 young people in nine schools within the SHIPS region (Southampton, Hampshire, Portsmouth and the Isle of Wight) and was funded by The Joint Investment Fund for the Arts. The research demonstrated that the physical fitness of the participants increased and that this increase was statistically significant among the females. With regards to psychological wellbeing the study also found positive adaptations in the participants, although these were not statistically significant.

NRG was successful in providing the first robust evidence for the health benefits of creative dance so that it can be acknowledged as a valid alternative to sport. The project was considered to be ground-breaking because, although there is a wealth of evidence for the health benefits of physical activity in general, NRG was the first study to look specifically at the physiological and psychological benefits of creative dance (i.e. not aerobics or exercise to music).

2.2 Project Partners

Hampshire Dance is a vibrant and innovative regional dance agency that leads on youth dance across the south east, initiates development opportunities for dance professionals and provides information and advocacy about dance. In 2007 Hampshire Dance was awarded funding from The Big Lottery Wellbeing Programme (through the chances4change portfolio) to lead VitaliSE, a three-year regional youth dance and health programme across the south east of England. NRG2 forms one strand of this regional programme and thus sits within the context of wider youth dance development in the south east. Hampshire Dance was the lead agency for NRG2 and took responsibility for fundraising and project management.

Having led on the research element of the first NRG project Trinity Laban was the natural academic research partner for NRG2. Trinity Laban is one of the world's leading centres for the training of professional contemporary dance artists and has a highly regarded Dance Science Department.

West Sussex County Council's well respected Arts Development Service has established links to the local Primary Care Trust, and was keen to be involved in the project from its inception. As well as providing funding towards the overall project costs West Sussex County Council supported the delivery of NRG2 through the authority's Dance Development Officer. Additional funds were secured for NRG2 through West Sussex Primary Care Trust and Youth Dance England.



2.3 School Recruitment and Engagement

Consultation took place in advance of the project with a number of key individuals in order to foster support from key stakeholders. The consultation process included the following people:

- South East Region Development Manager, Physical Activity (Department of Health, Government Office South East)
- Regional Healthy Weight Lead (Department of Health, Government Office South East)
- Advisor for Physical Education (West Sussex County Council)
- Partnership Development Manager (Southern School Sports Partnership)
- Partnership Development Manager (West Sussex West School Sports Partnership)
- Partnership Development Manager (Crawley School Sports Partnership)
- Senior Public Health Officer (West Sussex Primary Care Trust)
- Healthy Weight Lead (West Sussex Primary Care Trust)

These consultation meetings enabled Hampshire Dance to ensure the aims of the project were in line with local and regional health priorities. West Sussex Primary Care Trust (PCT) identified three Local Neighbourhood Improvement Areas along the coastal area of the county as being most in need of the intervention. Young people in Littlehampton, Worthing and Shoreham were therefore targeted for the project.



2.4 Project Aims

Overarching aims for the project were to:

- Add to the body of evidence for the health benefits of creative dance
- Inspire and motivate young people from West Sussex through dance
- Inspire young people to pursue and increase levels of involvement in dance and/or other kinds of physical activity
- Advocate for dance for health in order to secure future investment both regionally and nationally
- Identify the ways dance can fulfil a Primary Care Trust's agendas for physical activity

2.5 Rationale for Research

Research has found that young people's involvement in physical activity decreases during adolescence, especially at the transition between primary and secondary school (Biddle et al, 2004). This is mostly true for females who participate less in physical activities than males of the same age. Research has also found a positive relationship between physical activity behaviours during adolescence and levels of physical activity in later life (Biddle et al, 2004). Therefore, an increase in both male and female levels of activity during adolescence could lead to an increased involvement in physical activity in adult life.

Preliminary research in dance and health such as NRG: Youth Dance and Health (Quin et al, 2007) and Dance 4 Your Life (D4YL) (Connolly et al, 2009) projects have found that dance is an appropriate physical activity to maintain and improve aspects of physical fitness and well-being in young females. NRG2 was specifically developed to deepen our understanding of the benefits of creative dance.

Multiple physiological and psychological benefits were reported in earlier studies such as increased cardiovascular fitness, flexibility and self esteem. In addition, it has been argued that the artistic component of dance also enables participating young people to have the opportunity to express themselves creatively and develop their artistic skills (Lobo et al, 2006). NRG2 is unique in the area of dance and health research as it was specifically developed to deepen our understanding of how creative dance, in particular, can affect young people's health and well-being. The focus was based on gender to observe differences in the impact of creative dance and in the young people's attitude towards the activity.

Physical Activity Benefits

Physical exercise is one of the main determinants of physical fitness (Ortega et al, 2008b). In adolescents it has been found that increased cardiorespiratory fitness can be correlated to a decrease in total body fatness (Ortega et al, 2008b). In addition, Moore and colleagues (2003) gave evidence about the protective nature of physical activity in early childhood as it can delay the onset of rapidly increasing body fat (between ages 4 and 6 years old) as well as help establish an active lifestyle early on.

Inactive behaviours in childhood are likely to result in inactive behaviours in adult life; in fact, inactive behaviours are more likely than active behaviours to track through to adult life (Kohl and Hobbs, 1998; Tudor-Locke et al, 2001). Less active adolescents are more likely to engage in risky health behaviours such as smoking compared to their highly active counterparts (Pate et al, 1996). This suggests that inactivity not only affects young people's health and well-being but their behaviour as well. Sedentary behaviour in young people has also been linked to orthopaedic problems and even reduced life expectancy (Kriemler et al, 2010). Therefore, maintaining regular levels of physical activity in childhood and adolescence is regarded essential for long-term positive health related attitudes and behaviours (Pate et al, 1996; Ortega et al, 2008; Barnett et al, 2009). However, research continues to show that children do not engage in sufficient physical activity to elicit such health benefits (Burgess et al, 2006).

Along with the health benefits of being physically active, physical activity has been linked to the ability to perform fundamental motor skills such as jumping or kicking (Barnett et al, 2009), increased mean academic achievement scores for young people (Grissom, 2005) and improved mental health and self-esteem (Ortega et al, 2008). In adolescents, greater levels of physical activity were associated with perceived competence, achievement orientation and an intention to be active (Biddle et al, 2004).

Gender Differences

Girls are twice as likely as boys to report inactivity (Allison and Adlaf, 1997). Riddoch et al (2004) conducted a study on the physical activity levels of 9 and 15 year-olds in four European countries. At both ages, girls participated less in physical activity than boys. Pate and colleagues (1996) found that at high school age, 14.1% of students were classed as low active and in that group, the students were more likely to be female between the ages of 16 and 18 and non-white. Other studies have confirmed this finding by identifying ethnic and socio-economic factors to girls' involvement in physical activity (Brodersen et al, 2006). In another study examining physical activity levels of children and adolescents, it was found that even in the 3-12 year-old group, boys were more active than girls (Sallis et al, 2000).

Dance

National initiatives to increase physical activity levels such as Be Active, Be Healthy (2009) and Change for Life (2009) have identified dance as a major asset to get people exercising more regularly. Let's Dance with Change for Life (2009) provides an introduction to a variety of dance styles and presents dancers from English National Ballet, Strictly Come Dancing and Riverdance as role models that can inspire people. Benefits of physical activity have been seen not only in vigorous aerobic exercise but also through moderate exercise, carried out more regularly (Clippinger, 1997).

Dance therefore could be a viable moderate activity and could encourage participation within populations that tend to be less active (Clippinger, 1997).

For example, although adolescent girls report doing less team sport than males at the same age, they pick dance as their chosen activity more frequently than males (Clippinger, 1997). Participation in aerobic dance positively changed female's aerobic capacity and BMI in Flores's Study (1995). Additionally, Quin and colleagues (2007) found that creative dance classes were an appropriate physical activity to increase cardiovascular fitness for 11 to 14 year old girls. Dance for Health (Nordin and Hardy, 2009) assessed the impact of community dance on a wide range of participants including young people from 11 to 16 years old and found a positive impact of dance on cardiovascular fitness, lung capacity, flexibility, confidence and emotional well-being.

In comparison to traditional Physical Education (PE), dance can provide the opportunity for fun and enjoyment without the element of competition (Allender et al, 2006).

Dance emphasises expressive, creative and aesthetic aspects of physical activity, along with providing good social support for individuals who participate (Burgess et al, 2006).

Conversely, sport is more likely to emphasise outcome-related or competitive aspects (Gurley et al, 1984). Gurley and colleagues found that when compared to sport and academic activities, dance exhibited more positive changes in well-being. This was especially true for aspects related to stress, anxiety and depression (Gurley et al, 1984). Dance has also been found to be an appropriate mode of physical activity to develop young people's fundamental movement skills compared to other physical activities (Jefferson-Buchanan, 2005).

Additional research has shown that participating in dance can increase self esteem and levels intrinsic motivation towards dance (Quin et al, 2007; Connolly et al, 2009). In a study by Stinson (1997), participants reported that dance was fun and a way to interact with their friends. It helped them forget about their problems and provided a means of self-expression. Creative dance in particular focuses on open ended tasks that utilise the imagination and encourage choice making allowing for even greater opportunities to interact with friends and self-express.

NRG2 aimed to develop and deepen the methods and findings from the previous NRG: Youth Dance and Health study (2007). As such, the research maintained a focus on elements of physiological fitness and psychological well being. The intervention element of the project remained focused on creative dance.

Developments within the NRG2 research included:

- An assessment of basic need satisfaction in relation to the participants' motivation
- Introduction of a standardised measure of attitudes towards physical activity
- Inclusion of control group
- Consideration of gender-specific responses to the physical activities within the project.



3 PROJECT DEVELOPMENT

3.1 Recruitment of Schools and Young People

It was anticipated that after-school sessions, or open access classes, would attract only those with a prior interest in dance. To ensure that the young people participating in the project were representative of the young people in the area, the project was therefore delivered within the school curriculum.

West Sussex Primary Care Trust identified Local Neighbourhood Improvement Areas in which to target the project. This enabled Hampshire Dance to ensure that the activity benefitted those young people suffering the greatest levels of health inequality in the county. Following consultation with the West Sussex Physical Education Advisor three schools in Local Neighbourhood Improvement Areas were invited to take part in the project.

- Worthing High School
- Shoreham Academy (previously King's Manor School)
- Littlehampton Academy (previously Littlehampton Community School)

3.2 Devising and Structuring the Creative Dance Sessions

A team of five experienced freelance dance artists was recruited to deliver the project and the appropriate checks were made regarding their suitability to work with children and young people. The team included both male and female dance artists.

During a two-day training period they worked together to devise the content of the creative dance programme. The training also incorporated input from the Trinity Laban Dance Science Researcher in order to ensure that each artist had a clear understanding of the research element of the project and the need for consistency of delivery.

The team of dance artists devised a dance programme that incorporated recognisable contemporary dance, but focused mainly on enabling the young participants to create their own dance movements and phrases based on the theme 'Olympics.' It was agreed that each session would be structured to include the following:

- Warm up – incorporating a gentle pulse raiser
- Creative Development – providing opportunities to create, perform and appreciate dance
- Cool down – incorporating stretches, reflection and closure

3.3 Sharing Event and Signposting

At the end of the programme delivery, a sharing event was arranged in order to bring together all three schools involved in NRG2 to share their experiences and celebrate their achievements. The event was hosted at Worthing High School and included workshops, presentations and an informal performance to which parents were invited. West Sussex Youth Dance Company was also invited to perform at the event in order to inspire the project participants to take up dance following the end of the project. In addition, participants were signposted to local dance opportunities through a booklet created by Hampshire Dance with the support of the West Sussex County Council Dance Development Officer.

3.4 Project Delivery

The project took place over the course of one academic term. The young participants took part in one 50 minute session of creative dance per week over a 10-week period. Testing for the research project took place immediately before the 10-week programme of dance and immediately afterwards. Follow-up testing took place three months after the project delivery had finished.

Term time	Project
Week 1	Physical testing and questionnaires
Week 2 to 11	Creative dance classes and PE classes
Week 12	Physical testing and questionnaires Sharing event
Three months later	Focus group discussion with the experimental group



4 PROJECT RESEARCH

4.1 Methodology and Findings

Participant Information

	Male	Female	Total Participants
Experimental Creative dance	60	98	158
Control PE	13	66	79
Total	73	164	237

Students participating in the project were all in their first year of secondary school (Year 7 or 8); average age was 11.4 years and ranged from 11 to 13 years-old. Research has found that the entry to secondary school is an important transition period in terms of the young people's engagement in physical activity (Allison and Adlaf, 1997; Brodersen et al, 2006). The three schools involved in the project each provided three classes. Of the three class groups, two were involved in the creative dance project as the experimental groups and one acted as the control group, continuing PE classes as usual. Overall, there was one all boys' class, two mixed classes and three girls' classes in the experimental group. All groups were exposed to a minimum of 80% of the 10 week intervention.

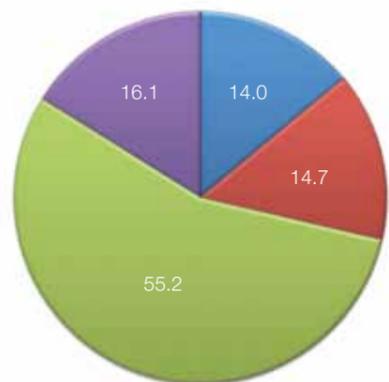
Groups' Gender

	School 1			School 2			School 3		
Group	Dance 1	Dance 2	PE	Dance 1	Dance 2	PE	Dance 1	Dance 2	PE
Gender	Mixed gender	Mixed gender	Mixed gender	Boys Only	Girls Only				

General Physical Activity

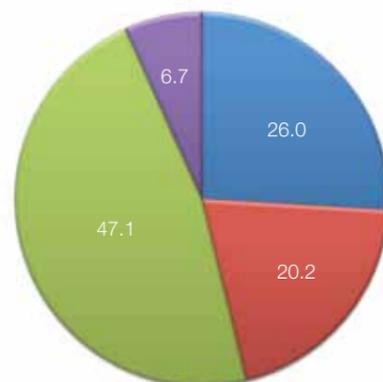
Habitual involvement in physical activity was recorded at the pre-testing stage of the project. The activities the young people participated in outside of the school setting were logged as well as the length of time they were exposed to the activities each week. This was to determine how much physical activity the participants engaged in and monitor how much this extra physical activity affected their results. There are however limitations to using self-reporting within physical activity research in young people: physical activity behaviours in children can be complex especially regarding 'unplanned' play and lifestyle activity which although they do not appear in self-reporting might account for a large amount of the young people's physical activity (Riddoch et al, 2004).

Habitual physical activity of the participants in the project



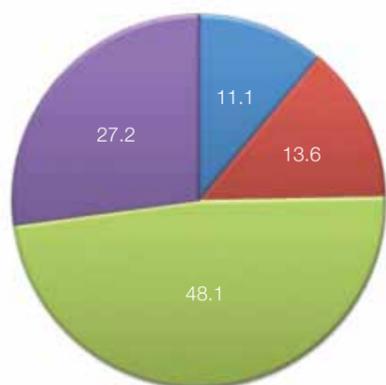
Physical Activity: Girls Experimental

- Dance
- Swimming
- Other
- No PA



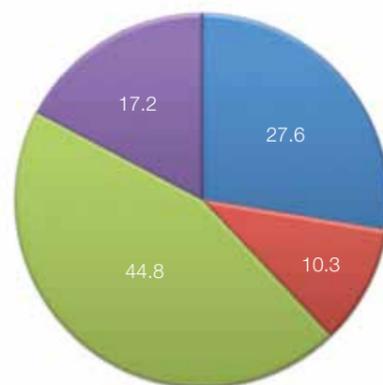
Physical Activity: Boys Experimental

- Football
- Cycling
- Other
- No PA



Physical Activity: Girls Control

- Dance
- Walking
- Other
- No PA



Physical Activity: Boys Control

- Football
- Cycling
- Other
- No PA

Finding: Clippinger (1997) states that during adolescence, although girls report doing less physical activity than boys, they choose dance more often than boys as a form of exercise. Dance was cited as the second most popular activity for girls after either swimming or walking. Boys did not engage in any dance. Football and cycling were the most popular physical activities for boys both in the experimental group and the control.

Physical Fitness Testing

Aerobic Capacity

Aerobic capacity was assessed using the 20m Shuttle Run Test (also known as the 'Bleep Test'). The participants ran from point A to point B and back to A (distance of 20m), keeping pace with a soundtrack which dictated the speed at which they should travel. As the test continued, the pace progressively increased. The test was completed when:

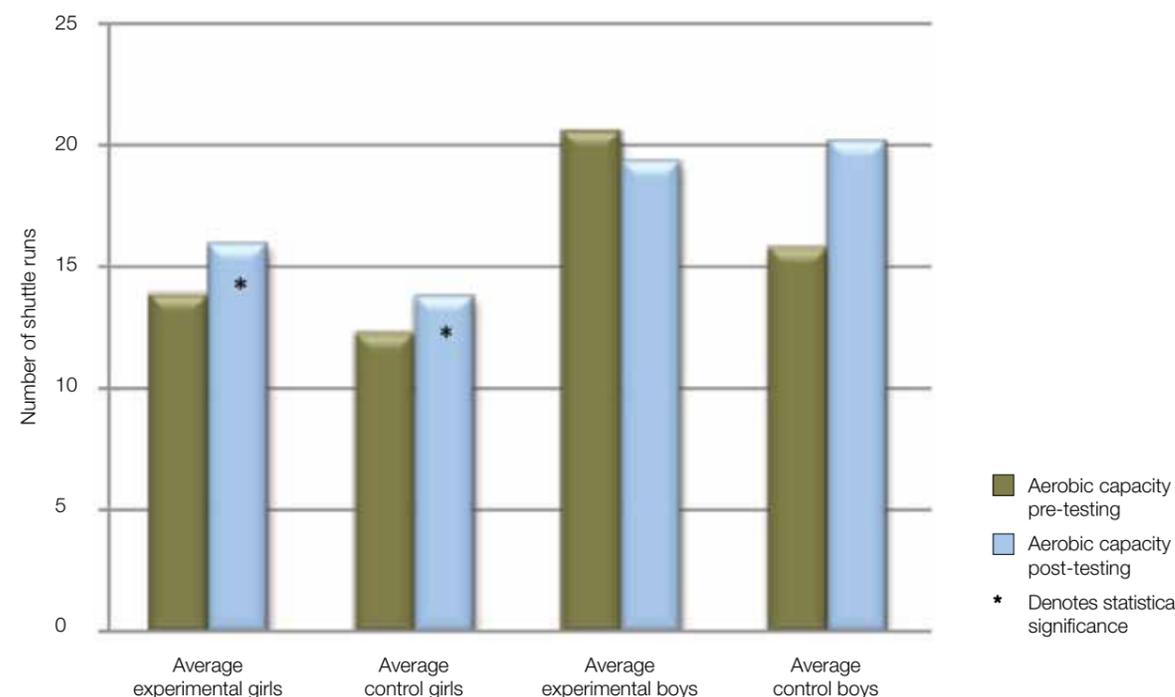
- The participants felt they could not continue
- The participants were failing to run the 20m in time twice in a row (not reaching back to point A in time with the 'bleep' sound; failing to run up to point B)
- The researchers felt it was not safe for them to continue

The number of runs completed was then recorded; higher scores representing better aerobic fitness. This test has shown good test-retest reliability for use with children and adolescents (Mahar et al, 1997). The participants were familiar with the test having performed it previously at school and it is one of the most commonly used tests to assess cardiovascular fitness in young people (Harris and Cale, 2006; Ortega et al, 2008b) and has been used by other health and fitness research involving young adolescents (Quin et al, 2005; Connolly et al, 2009).

Finding: Girls doing the creative dance classes and girls doing the PE classes significantly improved ($p=0.003$ and $p=0.019$) their aerobic capacity after the 10-week period. No significant differences were found in the male participants before and after the intervention period.

A significant but weak ($r=0.323$) relationship was found between the increase in aerobic capacity and the hours of physical activity performed outside of school for the girls in the experimental group. It can therefore be concluded that although their habitual physical activity played some part in their aerobic fitness, the change was mainly due to the participants' activity in school.

Aerobic capacity scores at baseline and after the intervention

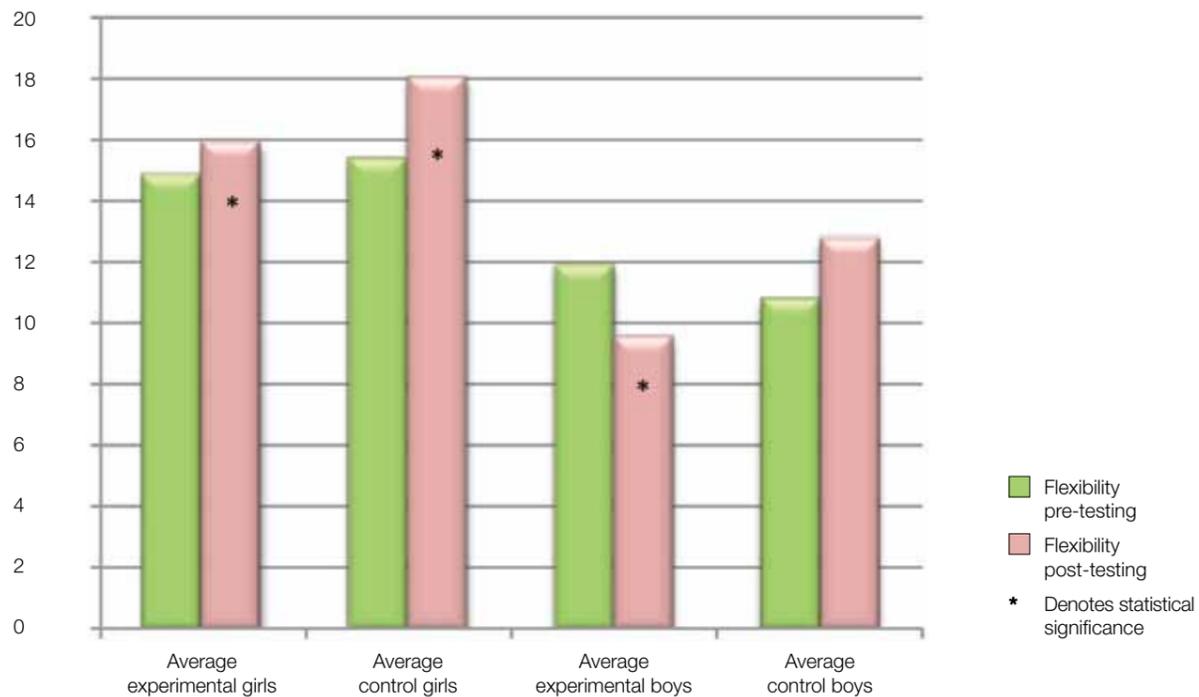


Flexibility

As a physical activity, dance is associated with high levels of flexibility. Flexibility is also one of the physical markers for health-related fitness; adequate levels of flexibility are required to avoid muscle tension and perform exercise (Caspersen et al, 1985). Hamstring flexibility was assessed using the Sit and Reach Test (Micro Medical, UK). Participants were asked to sit on the floor, both legs extended and the soles of their feet in contact with the sit and reach box. Keeping their knees extended throughout and with one hand on top of the other, participants were instructed to reach and slide their hands on the top of the box as far as they could go. After holding this position for a few seconds, a score was recorded. Throughout testing, the researcher checked to ensure that both knees remained extended. The test was repeated three times. A higher score represented better hamstring flexibility. Reliability for this test is strong for hamstring flexibility testing in young, school aged participants (Cornbleet & Woolsey, 1996; Baltaci et al, 2003; Swain & Leutholtz, 2007) and has previously been used in health and fitness research and testing (Ortega et al, 2008a).

Finding: The girls in the experimental group as well as the girls in the control group significantly improved their hamstring flexibility after the 10-week period ($p=0.020$ and $p<0.01$). No significant difference was found for the boys in the control group and the boys in the experimental group significantly decreased their flexibility ($p<0.01$).

Flexibility scores at baseline and after the intervention

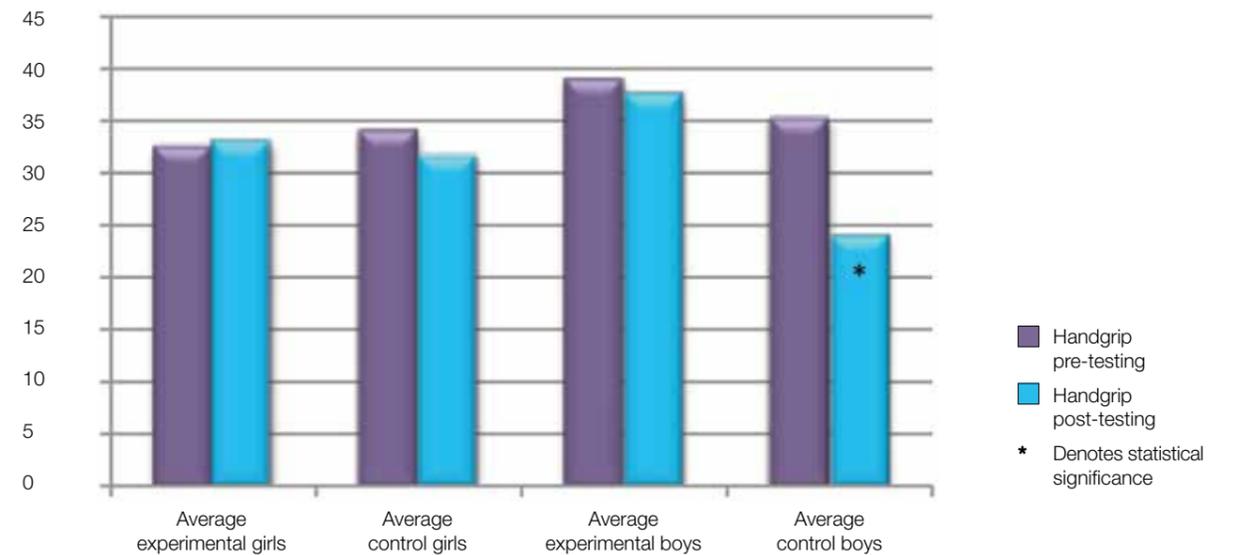


Upper Body Strength

Upper-body strength has been established as a predictor of life expectancy and morbidity and is associated with decreased cardiovascular diseases risk score and correlates to good adult bone mineral density (Ortega et al, 2008b). In dance upper-body strength is used for movements such as lifts or break-dance freezes. Upper body strength was tested using the Handgrip Test (Takei, Japan) as it is the most used measure for muscular fitness in epidemiologic studies (Ortega et al, 2008b). Participants had to grasp the Handgrip in their hand (the size of the grip was adjusted for each participant's hands), take their arm above their head keeping the elbow extended. Taking a breath, they were then instructed to bring their arm down, squeezing the handgrip as much as possible while still maintaining an extended elbow. A score was recorded and measures were taken twice on each side. A higher score was indicative of better upper-body strength.

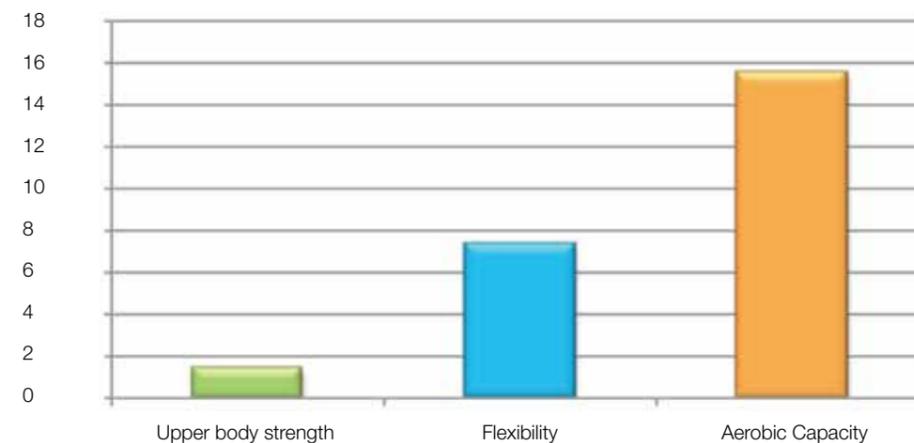
Finding: Although there are no statistical differences before and after the intervention on upper body strength in either group, there is a trend suggesting a more positive impact on upper body strength in creative dance as opposed to PE. Boys doing the intervention did not significantly change their upper-body strength whereas boys in the control group significantly decreased ($p=0.048$) their upper body strength after the 10-week period.

Pre and post Handgrip scores in the experimental and girls in the control group



Summary of physiological improvement in female dance participants:

Percentage of change in physiological assessments in the experimental girls group





Psychological Well-Being Assessment

Basic Need Satisfaction

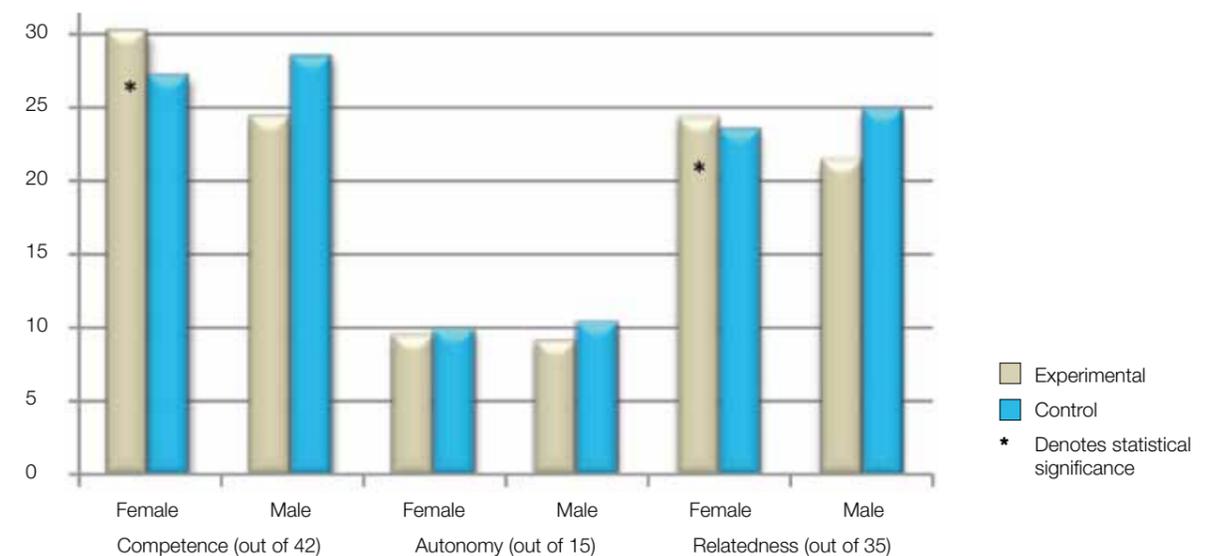
According to Ryan and Deci, (2000), there are three basic psychological needs: autonomy, competence and relatedness. All three are related to the motivation an individual has to perform a given activity (Quested and Duda, 2009). These three basic needs are essential elements to psychological growth and health (Reinboth et al, 2004; Vlachopoulos and Michailidou, 2006). When the three needs are satisfied, a person is more likely to partake in an activity because of internal grounds rather than exterior motivators (Ryan and Deci, 2000; Adie et al, 2008). To assess basic need satisfaction three subscales were used:

- The perceived competence subscale of the Intrinsic Motivation Inventory (McAuley et al, 1989). This assessment consisted of 6 items such as 'I think I am pretty good at this activity' and the participants were required to circle one of the following: 'Strongly disagree', 'Disagree', 'Disagree a little', 'Neither Agree nor disagree', 'Agree a little', 'Agree' or 'Strongly Agree'.
- The acceptance subscale of the Need for Relatedness Scale (Richer & Vallerand, 1998); this measurement consisted of 5 statements such as 'In my relationships with my classmates, I feel valued' and the participants were required to circle one of the following: 'do not agree at all', 'very slightly agree', 'slightly agree', 'moderately agree', 'agree', 'strongly agree' or 'very strongly agree'.
- The autonomy measure created by Sheldon et al (2001), this scale consisted of 3 items such as 'During these dance classes I felt free to do things my own way' and participants were required to indicate how true the statement was for them on a Likert-scale from 1 to 5 with 1 being 'not at all' and 5 being 'very much'.

The reliability of these three subscales has been tested in sports and dance science research (Quested and Duda, 2009). Questionnaires were distributed at the end of the project; participants in the experimental group reflected upon the dance classes delivered and participants in the control group related the questions to their PE classes. Responses to each statement were then calculated in accordance with the scales' instructions.

Finding: Basic needs satisfaction scores revealed that the girls in the creative dance group felt significantly more competent ($p=0.041$) than the girls in the PE group. The girls doing dance also felt significantly more competent ($p<0.01$) and related ($p=0.021$) than the boys doing dance. No significant difference was found between the boys in either group and no significant difference was found between the girls and boys in the control group.

Basic needs satisfaction at the end of the 10-week period for all involved groups



Attitudes Towards Physical Activity and Dance

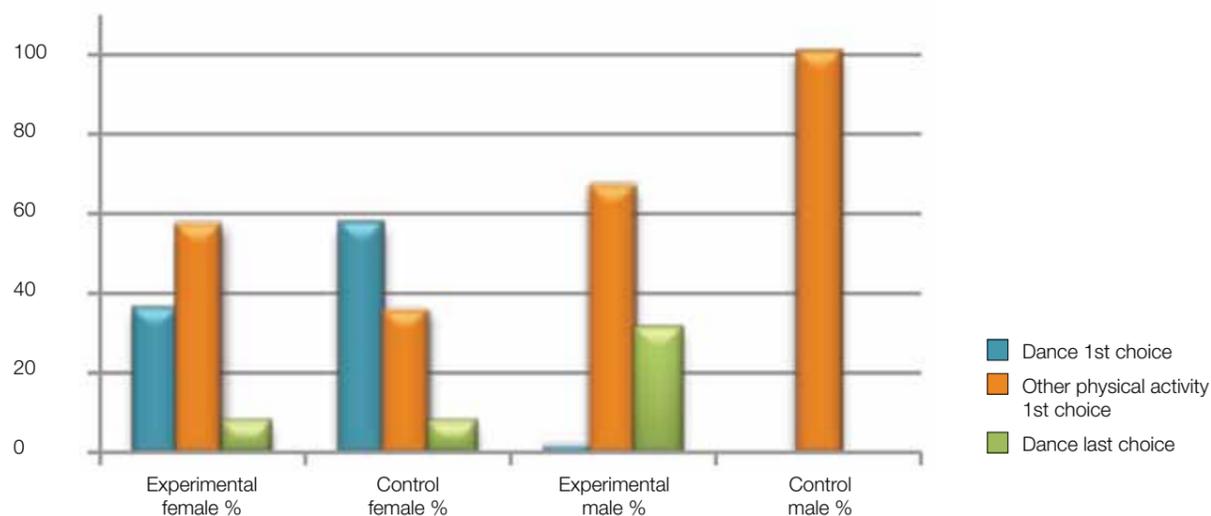
Young people's attitudes towards physical activity could be related to their level of engagement. It is therefore important to monitor the participant's feelings towards physical activity in general and towards dance. Attitudes towards physical activity were tested using the Children's Attitude Towards Physical Activity questionnaire (CATPA) created by Schutz et al (1985). This questionnaire consists of eight sub-scales each relating to different aspects of physical activity: social growth, social continuation, enjoyment of health and fitness, value of health and fitness, vertigo, aesthetics, catharsis and ascetics (Schutz et al, 1985). For each aspect, participants were asked to circle how they felt on five polarised scales such as 'good/bad' and 'pleasant/not pleasant'. Reliability of the CATPA has been tested to assess groups' statuses to identify factors that act between attitudes and behaviours as well as those which cause changes in CATPA (Schutz et al, 1985).

Finding: Attitudes towards physical activity assessed through the CATPA revealed that there were no significant changes in attitudes in either the experimental or the control group apart from the risk taking/vertigo component of the questionnaire for which there was a significant decrease ($p=0.014$ for the experimental group and $p=0.010$ for the control group) over the 10-week timeline. Separating the males and females' data did not affect the scores; each group was therefore pooled together as one.

In addition, a Trinity Laban devised questionnaire was used to assess the young people's attitude towards dance in particular, questioning how dance would rate against other physical activities when choosing to engage in physical activity.

Findings: At the beginning of the project, female participants had a more positive attitude towards dance than males. At the end of the 10-week period, there is still a very clear divide between the females' and males' attitude towards dance. Very few of the male participants would choose dance as their first physical activity and there is still nearly 1/3 of the boys experimental group that would not choose dance at all. The female participants have a more positive attitude towards dance in both groups and their attitude is reflective of their stated habitual activity: they would participate in dance as their first or second choice with swimming often cited as an alternative first activity. Very few of the female participants would not want to do dance at all.

Attitudes towards dance at the end of the project



Follow-up

To obtain more focused data about the participants' involvement and attitudes towards dance, a follow-up testing period was setup. Participants were organised in small focus-groups of six to eight young people and were asked to reflect on their experience of dance throughout the project and their experience of dance in general. A group discussion was encouraged and a researcher was present to direct and facilitate the dialogue. The focus group discussion was recorded and was later transcribed. Post-it notes were used throughout to enable the participants to write down words they associate with dance and the creative dance classes without being overlooked by their peers.

Finding: Female participants had a more positive response to dance in general as well as to the project. Boys felt that dance was a 'girly' activity and thought that they would feel stupid going to a class.

4.2 Discussion and Implication of Findings

- A significant increase in aerobic capacity and flexibility was found in the girls doing the dance classes as well as the girls doing PE. No change was observed in the boys' aerobic capacity across both groups and a significant decrease in flexibility was found in the boys doing dance. This finding provides further insight into gender differences when exposed to physical activity but also suggests that a creative dance programme could replace PE without a negative impact on participants' fitness.

Previous research in dance and health has found that dance can significantly improve adolescent girls' aerobic capacity (Quin et al, 2007; Connolly et al, 2009). A similar result was found for girls doing dance in this project. It is worth noting that the dance classes' aim was creative rather than aerobic; a significant increase in aerobic capacity in the girls is therefore of value since it has been found that girls engage less in physical activities compared to boys but choose dance more often than their male counterparts (Clippinger, 1997). Girls in the PE group also increased their aerobic capacity; this might seem unsurprising since sports participation is linked to increased fitness. Improved aerobic capacity in childhood and adolescence has been associated with decreased body fatness, improved cardiovascular system and improved bone health (Ortega et al, 2008a). A Trends study also found that although there was a decrease in sports' participation in young people, there was an increase in girls participating in dance (Trends, 2003). Girls who might not participate in sports are more likely to choose dance and this study gives further rationale to increase dance provision in schools for health benefits.

Male participants did not change in aerobic capacity after the 10-week programme. This is similar to findings from Quin and colleagues (2007) which showed that male participants did not improve their aerobic fitness through an 8-week dance project. It was hypothesised that boys needed to be taught separately since the intensity of the mixed classes was not sufficient to elicit an improvement in the boys. Information about how boys responded to being grouped in a single sex dance class as opposed to a mixed sex dance class was therefore gathered for the NRG2 project. No significant difference was found however between the effect of creative dance or PE on boys taught alone and boys taught in a mixed group. This shows that for young males, PE can also be substituted for creative dance without adverse effect on their fitness. In addition, research has found that although PE is viewed as the primary source of children's physical activity, actual time spent in moderate to vigorous exercise in a PE class only amounts to 10%- 20% of the time (Flores, 1995 Tudor-Locke et al, 2001).

Flexibility improved for all females, supporting and extending previous findings. No change was found in flexibility in the males in PE and a significant decrease was found in the males in dance. Baseline flexibility was higher for females than males, therefore it would be expected that the males had more opportunity for flexibility increases. It could be assumed that the decrease in flexibility for this particular group could be due to the lower interest the boys had in dance, given that both boys and girls were exposed to the same dance programme.

- **Competence (Perceived capability) was significantly higher in girls doing the dance classes than any other group in the project. The girls doing the dance classes also had a significantly higher feeling of relatedness compared to the girls doing PE. Although girls doing dance felt significantly more competent than the boys doing dance, there was no significant difference between boys and girls in the control group.**
- **Greater basic needs fulfilment was found in girls doing the dance classes which suggests more intrinsic motivation to participate in the activity.**

Boys were unfamiliar with the movements they performed in dance which could explain why they felt significantly less competent than the girls doing dance. Responses from the follow-up testing showed that the boys participating in the project found the movement 'strange', 'different', 'weird', 'quite complicated' and 'really hard'. Research has found that young people's perception of their physical ability has been shown to be an important predictor of participation, effort and long-term engagement in physical activity. Competence is therefore suggested to be a primary motivational factor for voluntary participation in sport and physical activity (Burgess et al, 2006; Vlachopoulos and Michailidou, 2006; Adie et al, 2008). Due to this lower competence perception, male participants in the dance classes might have put less effort in the programme which could explain the less positive effect of dance on boys compared to girls.

The need for relatedness is fulfilled when an individual is securely connected to and understood by others. Research has shown that friends' participation in physical activity is one of the most highly significant predictors of activity for adolescent girls (Allison and Adlaf, 1997). Girls with more physically active friends report higher activity levels themselves. Girls who are less frequently active with friends are less frequently active overall which suggests that time spent apart from friends was not spent participating in physical activity (Voorhees et al, 2005). Feeling supported and part of a group is therefore essential to encourage girls' involvement in physical activity. Girls in the dance classes felt significantly more related than girls in PE which again demonstrates that dance is a good way to get adolescent girls into physical activity.

- **Girls cited dance as their second most popular physical activity and very few would not choose dance at all when considering participation in physical activity. In contrast, no boy was involved in dance activities and nearly 1/3 of the boys in the dance group would place dance as their last choice of physical activity.**
- **Boys had a much narrower knowledge of the different styles of dance than girls citing only nine styles (mostly related to either street dance or ballet). Girls cited 29 dance styles demonstrating a much broader understanding of dance as a physical activity. The choice of words used by boys was in majority negative and demonstrated a bias in their opinion of dance in general.**

Gender differences in response to dance classes (through questionnaires and interviews) are evident and need to be addressed in the future delivery of creative dance programmes. This project showed that there is still stigma attached to boys' involvement in dance and an early introduction to dance could help reduce these preconceived ideas.

- **Analysis of the participants' attitudes towards physical activity revealed that all participants identified being with their friends as an important part of physical activity alongside the value of the activity for health benefits. The least favourite aspect of physical activity for all participants was commitment. Boys also rated the aesthetic aspect of physical activity low whereas girls rated the risk-taking aspect low.**

Research has shown that although health benefits are recognised as a reason for participating in physical activity for most age groups, other factors such as weight management, enjoyment, social interaction and support were more common reasons for young people being physically active (Allender et al, 2006). The current project's findings further support these results. Cale and Harris (2006) propose that influencing participation in physical activity rather than fitness should be the goal of physical activity and health interventions. Finding out how young people feel about physical activity is hence an important part of health and physical activity research.

- **Overall, creative dance had a positive impact for girls' physical and psychological well-being but no change was found for male participants. The inclusion of a control group meant that some comparison could be made between the impact of creative dance and PE on the participants as well as providing additional scientific validity.**

This is one of the most robust dance and health research studies carried out to date, given the inclusion of a control group and the development of previous research methodologies. This project supports previous findings and further develops an understanding of the effect of creative dance on young people. New findings in relation to needs fulfilment and attitudes towards dance were uncovered.



5 EVALUATION OF PROJECT

Feedback about the project was obtained from the school teachers and artists via a questionnaire and the participants were able to voice their opinion about the project during the follow-up testing period.

Overall, participants had a positive response to the dance programme even though this was mostly seen amongst the girls compared to the boys. The participants who didn't enjoy PE felt that the dance classes were fun and enjoyable: "It was much more fun than I thought it would be."

PE teachers found that children who had never previously relished physical activity were inspired by the dedicated dance classes that the project provided:

- "They loved it, really got into it. They've made great progress and got much more confident."
- "I hope it will have a lasting impact. It will have benefits in terms of the profile of dance in the school and in the community. I think it'll give me ammunition to say that every child – the boys as well – should be dancing."

Other feedback included comments about the project structure as some teachers felt the participants would have enjoyed the programme more if they had prepared a dance for a performance at the end of the term. One of the artists commented about the experience the participants had saying that many appreciated the opportunity to use team-building skills in an uncompetitive environment. This was especially true for the boys in the group since dance challenged how they worked as a team.



6 CONSIDERATIONS FOR FURTHER RESEARCH

In order to improve the understanding of the physiological and psychological effect of dance on young people, several aspects of the research could be examined further:

- Since it was found that the positive effects of physical activity could be seen in early childhood (Moore et al, 2003), it would be interesting to observe the impact of creative dance within a younger population of school-aged children. An earlier introduction of dance could help change preconceived ideas for boys.
- Although a control group was included within the NRG2 project, more information regarding the unique qualities of creative dance as a physical activity could be gathered with the addition of a control group that does not participate in any physical activity. Three groups could therefore be put in place with one doing creative dance, another doing PE and a third with no physical activity. This is nonetheless difficult to organise within the school curriculum.
- Due to the limitations of self-reporting, a more accurate way of measuring habitual physical activity such as the use of an accelerometer could be used in further research. This could help determine the importance of unplanned physical activity in relation to changes in physiological and psychological scores.
- Although the NRG2 project developed the methodology of previous research studies, more information is needed concerning the specific benefits of dance for male adolescents. The NRG2 project results seem to suggest that more exposure to and considered delivery of dance could help improve participation and motivation and therefore positively affect the impact of dance on boys.
- Because of the limited dance experience the participants had, the addition of more 'recognisable' dance vocabulary may have helped maintain their engagement. However, exposing the young people to less familiar experiences could be beneficial; a balance needs to be found.
- Future research could assess and intervention with more than one hour per week of activity. A study where the young people do two or three hours per week could be worth exploring to see the difference in the changes in health and wellbeing.

Hampshire Dance

023 8065 2712
www.hampshiredance.org.uk

Lucy Frazer (Director)
lucy.frazer@hampshiredance.org.uk

Sophie Amstell (Youth Dance Strategy Manager)
sophie.amstell@hampshiredance.org.uk

Jo Basham (Youth Dance Co-ordinator)
jo.basham@hampshiredance.org.uk

Trinity Laban

T: (0)20 8691 8600
www.trinitylaban.ac.uk

Emma Redding (Head of Dance Science)
e.redding@trinitylaban.ac.uk

Edel Quin (Research Supervisor)
e.quin@trinitylaban.ac.uk

Laura Blazy (Lead researcher)
l.blazy@trinitylaban.ac.uk

West Sussex County Council

T: 01243 756770
www.westsussex.gov.uk

Lorna Brown (Head of Arts and Culture Strategy)
lorna.brown@westsussex.gov.uk

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Participating Schools

Littlehampton Academy, Shoreham Academy, Worthing High School

Dance Artists

Victoria Bremner, Chay Burrows, Anne Colvin, Jo Cone, Christopher Reynolds

Trinity Laban Research Assistants

Sarah Beck, Terry Clark, Mary Kate Connolly, Shantel Ehrenberg, Lisa Guild,
Darren Grégoire, Kimberley Hutt, Katie Iacono, Ashley McGill, Mark Osman-Barter,
Karine Rathle, Helen Reeve, Erin Sanchez, Ivan Thorley, Imogen Walker, Talia Wheeler,
Amy Williams

Hampshire Dance Team

Sophie Amstell, Jo Basham, Lucy Frazer

West Sussex County Council

Kirsty Sulston

Photographs and Film

Cass Productions and Department of Health Wellbeing South East

Report Authors

Laura Blazy, Sophie Amstell

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