# Cardiff School of Sport

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**Dissertation title:** The effect of social support and gender on Wingate Anaerobic cycle Test performance.

**Supervisor:** David Wasley

## Comments

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### Title and Abstract
Title to include: A concise indication of the research question/problem. 
Abstract to include: A concise summary of the empirical study undertaken.

### Introduction and literature review
To include: outline of context (theoretical/conceptual/applied) for the question; analysis of findings of previous related research including gaps in the literature and relevant contributions; logical flow to, and clear presentation of the research problem/question; an indication of any research expectations, (i.e., hypotheses if applicable).

### Methods and Research Design
To include: details of the research design and justification for the methods applied; participant details; comprehensive replicable protocol.

### Results and Analysis
To include: description and justification of data treatment/data analysis procedures; appropriate presentation of analysed data within text and in tables or figures; description of critical findings.

### Discussion and Conclusions
To include: collation of information and ideas and evaluation of those ideas relative to the extant literature/concept/theory and research question/problem; adoption of a personal position on the study by linking and combining different elements of the data reported; discussion of the real-life impact of your research findings for coaches and/or practitioners (i.e. practical implications); discussion of the limitations and a critical reflection of the approach/process adopted; and indication of potential improvements and future developments building on the study; and a conclusion which summarises the relationship between the research question and the major findings.

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CARDIFF SCHOOL OF SPORT

DEGREE OF BACHELOR OF SCIENCE (HONOURS)

SPORT AND EXERCISE SCIENCE

The effect of social support and gender on Wingate Anaerobic cycle Test performance.

(Dissertation submitted under the discipline of Psychology)

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CARDIFF METROPOLITAN UNIVERSITY
THE EFFECT OF SOCIAL SUPPORT AND GENDER ON WINGATE ANAEROBIC CYCLE TEST PERFORMANCE.
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With special thanks to my dissertation supervisor David Wasley for his assistance throughout this project and to the volunteers who made this research possible.
ABSTRACT:

Objective: To investigate how different social support conditions affect performance in a Wingate Anaerobic cycle Test and to see whether there is a difference in the way genders interpret the social support conditions. Methodology: Ten participants (5 male, 5 female) took part in a Wingate Anaerobic cycle Test in three social support conditions; no social support, known social support and unknown social support. The peak power output, mean power output and fatigue index were measured and the participants filled out a social support questionnaire designed specifically for this study to measure the perception of social support for each condition. Results: The results show that there was no difference in the way males and females respond to social support. Also, surprisingly, there was no difference in the performance of the Wingate Anaerobic cycle Test between the ‘unknown’ social support condition and the ‘known’ social support condition. However, there was a significant difference between the ‘known’ social support condition and the ‘no’ social support condition. Conclusions: It was concluded that it is essential for fitness tests to be carried out in the presence of supporters who are known to the participant in order to produce reliable results upon which fitness regimes and cardiovascular medicine may be based.
CHAPTER I

INTRODUCTION
Social support is a construct that can help stressful situations and can be applied from various disciplines. Much of the previous research focuses on the effect of social support on sporting situations, especially injury rehabilitation (Mitchell, 2011). Though, this study will concentrate on the effects of social support upon exercise performance, more precisely for a Wingate Anaerobic cycle Test. It is believed that the results from fitness tests such as the Wingate Anaerobic cycle Test must show true maximal effort as the results can be used to produce lengthy training regimes and maybe more importantly in cardiovascular medicine. Hence, it is important that the environment in which the test is carried out provides the needs that the participant requires to produce maximal results.

This research focuses on both the perception and the reality of social support. However, it is apparent that the support does not always need to be concurrent and one’s perception of social support is thought to be just as effective in improving performance as received support is. This study aims to compare these two types of social support and to see whether the provider of the support appears to be of importance by comparing performance across conditions with known supporters and unknown supporters. Gender is also thought to show differences in the effect of social support, hence this study will compare how males and females interpret the three social support conditions.
CHAPTER II

LITERATURE REVIEW
The purpose of the following section is to analyse and compare the previous literature surrounding the topic of the effect of social support on exercise, with specific reference to gender. As will be explained, there are numerous types of social support which impact on performance in their individual ways.

Throughout previous literature, the term social support has been defined in numerous ways. Here is one of the earliest, though still true, definitions; social support is an ‘exchange of resources between at least two individuals’ with the intention of enhancing the wellbeing and/or performance of the recipient (Schumaker and Brownwell, 1984, p.13). Furthermore, it is a concept which is believed to encompass a network of personal ties, (Albrecht and Adelman, 1984) this is where the versatility of social support becomes obvious. This so called network could provide support to reduce insecure feelings, especially during times of stress. It can also provide companionship and further resources to help with mental and physical recovery. Social support is, therefore, believed to be of high importance for all activities; however it is most influential when participating in exercise and physical activity. The literature surrounding this topic does not seem to lead to a general conclusion; hence there is room for further research into the effects of social support on exercise performance. Sarason, Sarason and Pierce (1990) have previously stated that there is no evidence that social support significantly affects exercise performance yet they also proposed that it is possible for social support to affect ones exercise performance in numerous ways. Also, since then research has demonstrated that social support can alter performance by up to 24%. (Rees and Freeman, 2010).

The social support literature addresses the beneficial effects of social support across several situations. Firstly, it helps athletes with the stress caused by injury and rehabilitation (Mitchell, 2011) and ultimately its effect on exercise performance. However, athletes view reaching out for social support as a sign of weakness (Pensgard and Roberts, 2003). Therefore it becomes a redundant source of help when in fact its effects could be very positive for an athlete. This resentment in asking for help is mainly linked to ‘informational support’ which involves asking a coach for technical help and support. Richman et al. (1989) encouraged exercise participants to use social support regularly to aid performance. For these reasons social support is especially important from a sport
and exercise psychology notion, though according to Freeman and Rees (2008, p.359), social support is a ‘key construct in relation to mental health, physical health and physiological processes’ hence is spread across numerous disciplines adding to its need for a deeper understanding.

There are thought to be two main constructs of social support; perceived social support and received social support. According to Freeman and Rees (2010) perceived social support discusses an individual’s potential access to social support and their subjective judgements that they would be given support from friends/family/significant others in a time of need. On the other hand, received (enacted) social support refers to the actual support given by friends/family/significant others at the particular time of performance. (Freeman and Rees, 2010). In terms of psychology and mental health Freeman and Rees (2010) believe that it is an athlete’s perception of their social support that is of more importance than their received support. Though these two constructs of social support are similarly related, Freeman and Rees (2007) convey they are distinct constructs with only 20% similarity, hence both received and perceived supports will be measured across both males and females in this study.

These ‘perceived’ and ‘received’ constructs of social support were based on earlier research by Cohen and Wills (1985) who created two principle models to clarify how social support can alter performance outcomes; the stress buffering model and the main effect model. As stated by Freeman and Rees (2008) the stress buffering model proposes that support only affects an outcome when the individual is in a highly stressful situation. Alternatively, the main effect model states that support effect’s an outcome regardless of the level of stress in the situation. The following study is thought to be linked to the stress buffering model as the Wingate Anaerobic cycle Test produces a relatively stressful environment due to the maximal nature of the test.

According to Bianco and Eklund (2001) there are three main types; emotional support, informational/technical support and tangible support. Rees et al. (2007) later added esteem support to this list. Esteem support is most relevant to this study as it focuses on increasing one’s sense of competence and self-esteem (Bianco and Eklund, 2001) which the received support from the participants’ peers
will potentially provide, or not, depending on the preference of the individual. Emotional support relates to ‘being there’ to make people feel loved and valued, hence is also relevant to this study. Informational support is closely associated with the coach-athlete relationship; as according to Rees *et al* (2007) it offers instruction, guidance and supervision. Finally tangible support, as stated by Bianco and Eklund (2001) offers personal and/or material assistance such as a giving of time and knowledge or extrinsic rewards/gifts. In the case of this study the esteem and emotional social support will be provided through positive verbal encouragement, however informational and tangible supports are not included as these are considered to be areas of social support which can only be provided by persons with expertise, such as coaches. The other forms of social support, however, can be provided by anyone. (Rosenfeld, Hardy and Richman, 1989a).

A very important point that has arisen from previous literature is that the social support delivered is to come from a provider with which the recipient has a healthy relationship. Gottlieb (2000) found that social support is not effective for all athletes and its usefulness is reliant upon the relationship between the provider and the recipient. Furthermore, Gottlieb (2000) suggested that as the relationship between the provider and recipient develops the effectiveness of social support may increase over time. It has similarly been noted, by Rees and Hardy (2004), that it is of high importance for the providers of social support to diligently match their support to the specific needs of the recipient in order to improve their performance. Therefore, it has become apparent that coaches/fitness instructors and relevant others ought to be instructed in how to provide the most efficient social support. Richman, Hardy and Rosenfeld (1989b) explored strategies for coaches/fitness instructors to use in order to enhance the performance of their participants through the level of social support provided. A study by Smith, Smoll and Barnett (1995) followed this previous research by Richman, Hardy and Rosenfeld (1989b) to produce a study in which coaches received training to reduce the performance anxiety of their players by using social support techniques. The results showed that the coaches who had received the training were assessed more positively by their players. Furthermore, players reported to have more fun and despite the win-lose statistics there was a higher level of attraction to the coaches who had received the training. Finally, Smith, Smoll and
Barnett (2000) concluded that their intervention had significantly lessened the children’s trait anxiety level. This research can be applied to the concept of exercise fitness tests. This is because it is important for the test administrator to support the participant in the correct manner in order to ensure they produce maximal results.

Furthermore, it is vital to state that the social support given throughout this test will be of a positive manner. The participants’ peers/significant others will be cheering with words of encouragement and when the support comes from an unknown source the sounds played to the participants, again, will be positive. The results would tell a very different story if the support was to have a negative feel. This links in to the ‘home advantage effect’. The received support will come from peers that they have chosen to give the support so should have a positive effect on their performance in the Wingate Anaerobic cycle Test, virtually re-enacting the home advantage effect. Greer (1983) found that positive support from the home crowd of a basketball team resulted in a performance increase across all four areas of performance that were being studied, for the home team only. It was concluded by Greer (1983) that collective cheering from a crowd can be a successful form of social support. According to McNair et al. (1996) it is also believed that for the social support to have positive effects on strength performance the verbal encouragement must be vocalised at a relatively high volume. So, it can be concluded that for the verbal encouragement to be most effective it must arise in both a loud and positive manner.

One of the main focuses of this study will be to compare how males and females respond to social support. In past research it has been stated that female athletes express a higher level of perceived support than male athletes. (Rock and Jones, 2002). However, this study will look to compare how males and females react to both received and perceived support in hope that there will be a significant difference in the performance of a Wingate Anaerobic cycle Test. Here, performance relates to their Peak Power Output (PPO), Mean Power Output and Fatigue Index (FI). Mitchell et al (2007, p. 190) stated that there ‘is scope for research to advance understanding of how gender influences the social support process’ proving rationale for this study. Furthermore, Abrahamsen et al. (2008) carried out a study on perceived ability and social support in elite handball players.
The study demonstrated that females believe that social support is more available to them than males do; and females are less ego orientated than males. These findings can be linked to this study because it is hypothesised that males will have a higher ego, resulting in an increased difference in performance between the received and perceived support conditions when compared with the difference in the female performance results. Rosenfeld, Hardy and Richman (1989a) also found that gender can account for differences in the type of social support needed by athletes. One example that was established follows that high levels of technical support provided by coaches was associated with highly stressed males because they felt the need to perform well. As for females, this technical support was related to low levels of stress as they felt they had a good coach/athlete relationship. There is still room to see exactly how males and females respond to social support, especially in a situation such as this present study where the participants’ peers will be supporting them during a stressful fitness test.

The use of social support through verbal encouragement has become a very common procedure throughout the world of sport and exercise. The aim is to improve performance and although this can be done through vigorous training programmes recent research has looked into alternative psychological approaches. Amagliani et al. (2010) agree that numerous factors play a part in maximally activating a muscle, but that motivation and self-efficacy are the two key influences which result in an increase of muscular performance. Amagliani et al. (2010) combined verbal encouragement with visual encouragement to find significant increases in strength of the biceps, quadriceps and hamstrings compared to a control with no support. Furthermore, McNair et al. (1996) carried out a study on the peak forces of the biceps brachii with verbal encouragement and then without. It was found that verbal encouragement caused a 5% increase in mean peak force. Campenella et al. (2000) found similar results in that it is possible to increase peak torque values by as much as 5% through verbal encouragement, using ‘loud verbal commands’. Prior to this in 1993, Bickers looked into how verbal encouragement may affect performance in a motor endurance task; it was revealed that verbal encouragement increased performance by 39%. One of the key functions of providing verbal encouragement is to motivate athletes, however another key benefit is that it increases self-
efficacy; which can be defined as an ‘individual’s confidence in their capabilities to perform specific tasks.’ (Amaghi et al. 2010, p.165). Hence, it can be stated that an increase in exercise performance can arise through psychological processes including an increase in confidence and motivation and is not solely due to physiological training.

Adding to the studies covering social support and its effect on strength, a considerable amount of research has covered the effects of social support on maximal fitness testing. This opens another aspect in which social support can improve exercise performance, in addition to increasing muscular strength. Maximal fitness testing is a regular process within physiology. According to Andreacci et al. (2002) the results from these tests are important and can be used for cardiovascular assessment and provide the base upon which an exercise programme can be created and test the success of a particular training regime. Hence, it is important that the results produced from these maximal tests are as accurate as possible. The amount of verbal encouragement provided is a well-known determinant for the level of effort used by participants. Therefore, it is believed it can affect the final results of tests such as the Wingate Anaerobic cycle Test and VO₂ max. Bullinger et al. (2012) carried out a study to see the effect of verbal encouragement on performance in a Wingate Anaerobic cycle Test. They compared the performance in a Wingate test of ten female athletes’ to nine female non-athletes. The participants carried out two Wingate Anaerobic cycle Tests; one with ‘concurrent verbal encouragement’ and one with no encouragement. The results were somewhat surprising in that there was no significant difference in the peak and mean power output produced by both the athletes and non-athletes between the verbal encouragement and no verbal encouragement conditions. However, as expected the athletes’ peak power output and mean power output were higher than the non-athletes; most probably due to the higher fat free mass of the athletes. Bullinger et al. (2012) suggest that from previous literature it is apparent that verbal encouragement has a positive effect on male performance in a Wingate Anaerobic cycle Test; hence their study tested females only. Therefore, given that there was no difference between the two conditions of encouragement for the females ‘it could be argued that sex appears to be one key determinant of intrinsic motivation.’ (Bullinger et al. 2012, p.243). Furthermore, Bullinger et al.
(2012) stated that it has previously been found that it is due to intrinsic reasons that females take part in physical activity as opposed to males who are more likely to engage for extrinsic incentives. This could explain the results from Bullinger et al.’s (2012, p.240) all female study because ‘the effect of extrinsic motivation may vary based on population and not affect females in the same manner as males’. Further maximal fitness testing was carried out by Moffatt et al. (1994), this time on a VO2 maximal test but again comparing non-athletes to athletes. The results showed that verbal encouragement significantly increased the VO2 max values, along with treadmill run time and maximum heart rate for the trained participants only. There was no change for the non-trained runners, hence it was concluded that external encouragement is not necessary to manage a VO2 max test for highly trained competitive runners but is essential when considering non-runners to ensure true maximal results are recorded. It is clear that social support can have a positive effect upon performance, one explanation for this is that it could act as a distraction. Brooks & Brooks (2010) looked at the effect of music on performance in a Wingate Anaerobic Test for male and female non-athletes. Their results showed that motivational music had a positive effect on peak power, average power and total anaerobic power output. In conclusion, McNair et al. (1996, p.243) stated that ‘an awareness of the effects of verbal encouragement is important when motivating athletes to attain maximum performance during exercise.’

It is apparent that the effect social support has on performance outcome is largely positive. The results from a study directed by Rees et al. (2007) indicated that received social support can influence performance in a positive manner, adding to this Freeman and Rees (2008, p.366) ‘also demonstrated that social support is positively associated with performance outcome.’ One of the key causes of this positive outcome on performance is due to the stress buffering effects that social support can provide. However, according to Rosenfeld et al. (1989a) this may not always be the case and the support/stress buffering relationship may be altered according to the role of the person giving the social support (coach/team-mate/friend/parent) and the gender of the athlete. Hence there is a gap in the research regarding just how males and females respond to social support and
whether the stress buffering effect is the same for both genders. Freeman, Rees and Hardy (2009) carried out a study on three professional golfers using a one to one intervention where coaches provided social support to the golfers during stressful situations in a competition environment. All three of the participants improved their performance in the intervention phase and stated that the delivery of social support was both acceptable and useful. However, the results for only one of the participants were significant, making the study very limited. Freeman, Rees and Hardy (2009) stated numerous possibilities for this surprise result. Firstly, individual differences may have swayed the success of the social support intervention phase as people react differently to encouragement and advice. Secondly, there were differences in the baseline standard which was taken for each golfer before the intervention phase; this again may have influenced the effectiveness of the intervention as the high standard players were less affected by the social support. Finally, behaviours were classified into different support dimensions; however it is believed that these do not necessarily have uniform effects on performance outcome.

After evaluating the previous literature surrounding the topic of the effect of social support on sport and exercise performance the hypothesis for this study can be stated. Firstly, it is believed that there will be a larger difference between the perceived social support results and the received social support results for the male participants compared to the difference in the female results. This is because males are more ego-oriented and so should thrive when being watched and supported by their peers. In comparison, females are thought to be comfortable performing on their own and more often prefer not to be watched, especially when performing acute stressful exercise. Furthermore, the support given in the received support condition will be of a positive nature and will come from providers that the participants have chosen to ensure there is a good relationship between the provider and the recipient. Therefore, the second hypothesis states that the results from the social support questionnaire and the Wingate Anaerobic cycle Test will show a significant difference between the received social support conditions (known and unknown) and the ‘none’ condition. It is hypothesised that this will be true for both the male and female groups due to the motivation and increased self-efficacy that the esteem support will provide in the ‘known’ and
‘unknown’ social support conditions. No difference between the ‘known’ and ‘unknown’ conditions was hypothesised.
CHAPTER III

METHODOLOGY
3.1 RATIONALE:

The main purpose of this study was to investigate the difference between gender and performance in a Wingate Anaerobic cycle Test under different social support conditions. Much of the previous research in this area has focused on how social support can aid the rehabilitation process by reducing stress; with little attention on how it may affect exercise performance.

The following section covers the participants, instruments and the procedure used throughout the study.

3.2 PARTICIPANTS:

The participants were 10 undergraduates (five male, five female) aged 19-21 years who took part in sport regularly (at least 3 times a week) and had not suffered a serious injury in the last six months. The participants volunteered to be involved in the study by responding to an advert posted around the university via email. Prior to agreeing to take part the volunteers were sent a participant information sheet (Appendix A). This informed the volunteers of the procedure and what would be required from them. Also, before taking part the participants signed an informed consent form (Appendix B) to confirm that they had volunteered to take part and that they had the right to withdraw at any time during the study. Finally, all the participants were screened, using the Physical Activity Readiness Questionnaire (PAR-Q) (Appendix C) before participating to check for any underlying health problems which would prevent them from partaking in this study.

3.3 INSTRUMENTS:

The performance part of this study was measured using a Wingate Anaerobic cycle Test, hence one cycle ergometer with an electromagnetic brake was used. The data was recorded straight onto a computer for each Wingate Anaerobic cycle Test. The researcher could record the Peak Power Output (PPO), the Mean Power Output (MPO) and the Fatigue Index (FI) from the data produced on the screen. The computer generated two sets of results, corrected and uncorrected,
for each of the Wingate Tests. The uncorrected set of results take into account the inertia of the flywheel, though this is thought to make the results less reliable. Hence, for this study the ‘uncorrected’ set of results was used to record the PPO, MPO and FI.

Numerous weight discs were applied to the weight basket on the cycle ergometer; the amount was unique for each individual depending on their body weight.

After each Wingate Anaerobic cycle Test, the participants would fill out a social support questionnaire (Appendix D) that was designed specifically for this study to measure the perception of social support in each of the three social support conditions; No social support (NS), Known social support (KS) and Unknown social support (US). Questions 1 and 2 required the participants to tick a line scale of 1 – 10. These measured the level of perceived support and the level of preferred support for each condition. Question 3 involved a list of 30 phrases with the instructions to circle the relevant ones for each condition. Finally, questions 4 to 10 utilized a 5 point Likert scale to measure how the social support made them feel and if they enjoyed being watched, analysed and supported.

3.4 PROCEDURE:

Firstly, the researcher ensured every participant had filled in, and returned, their participant consent form and PAR-Q. Before testing got underway the researcher gave a short briefing to explain the process of a Wingate Anaerobic cycle Test, emphasising the importance of a four minute warm up and a significant cool down. As all the participants were sport students at Cardiff Metropolitan University they had at least observed, if not participated in, a Wingate Anaerobic cycle Test prior to this study. This meant that a practice was not necessary and would have wasted the participants’ time.

Every participant carried out a Wingate Anaerobic cycle Test in all of the three conditions with a one week rest in-between. For each of these conditions the participants’ body weight (kg) was recorded before the start of the test. This was needed to work out the resistance needed for the test as 7.5% of their body weight was applied to the flywheel on the cycle ergometer. Halfway through the four
minute warm-up the participant practiced a three second sprint with their personal resistance on the fly wheel. This allowed the participants to get a feel for their resistance before the sprint test started. The Wingate Anaerobic cycle Test was initiated with a rolling start at 60rpm, while the researcher counted down to the start of the test when the resistance was applied immediately. The participant then sprint cycled for thirty seconds with their specific resistance of 7.5% of their body weight. It was important that they stayed seated throughout the thirty seconds to ensure the tests were reliable. Below are detailed explanations of how the social support conditions varied.

3.4.1 NO SOCIAL SUPPORT (NS): Only the researcher(s) were present for this first social support condition. This allowed for perceived social support to be measured without distraction from any enacted support. The researcher could not give any encouragement and would remove the resistance when thirty seconds had passed. The participants would then fill out the social support questionnaire based on their feelings of the social support level in the NS condition.

3.4.2 KNOWN SOCIAL SUPPORT (KS): Each participant was instructed to bring four ‘significant others’ or peers (family/friends/coach/team-mates and so on). These could not be provided by the researcher in order that it was a personal choice as to whom the participant most liked to be supported by. The males chose four males supporters and the females chose four female supporters. As the testing got underway the ‘significant others’ supported the participant by cheering and giving encouraging comments, this is known as esteem support. It was important that the comments were of a positive nature. Any mention of time was not allowed until twenty seconds had passed to ensure that the participant did not feel disheartened from not passing halfway. Again, all the participants filled out the social support questionnaire after partaking in the test.

3.4.3 UNKNOWN SOCIAL SUPPORT (US): Similar to the KS condition, the US condition was aimed at measuring how received social support effects performance. However this time the social support was provided through a sound clip of cheering hence came from people ‘unknown’ to the participant. They listened to the support through headphones which was of a positive and
encouraging nature. Finally, the participants filled out the social support questionnaire when the test was finished.

3.5 DATA ANALYSIS:

The data from the social support questionnaire was collapsed into four sections.

3.5.1 PERCEIVED SUPPORT: The line scale was 10cm long. The point at which the participants placed their tick was measured with a ruler and the exact centimetre of the tick represented the level of the perceived support. (eg: if the tick was placed 2cm along the line then the participants level of perceived support was 2/10). This measure primarily acted as a manipulation check to ensure that the participants could identify the different levels of social support across the three conditions.

3.5.2 PREFERRED SUPPORT: Again this was a line scale which was 10cm long and the point at which the tick was placed equalled the percentage of preferred support. (eg: if the tick was 8cm along the line, then the participant would have preferred 80% more support).

3.5.3 POSITIVE AND NEGATIVE PHRASES: The 30 phrases were split into a ‘positive’ group (17 phrases) and a ‘negative’ group (13 phrases). A frequency count was applied for each condition to create a total score for positive and negative phrases for each gender in each condition.

3.5.4 TOTAL SUPPORT: The scores for the Likert scales in questions 4 – 10 were changed from -2, -1, 0, 1, 2 to 1, 2, 3, 4, 5 and the scores for the negative questions were reversed to allow all the results to be positive. This enabled the answers to be totalled to make a score out of 35 for each participant.

This data, along with the data produced from the Wingate Anaerobic cycle Test was compared between the male and female groups and across the three social support conditions. Therefore, a two (gender) x three (condition) way ANOVA statistical test was applied. The condition of social support (NS, KS and US) was the independent variable, with gender acting as the dependent variable. Independent samples t-tests were additionally carried out as post-hoc’s to identify
where the differences occurred in the data. All the data analysis was carried out in the IBM SPSS statistics programme.
CHAPTER IV

RESULTS
Table 1: Mean and Standard Deviations for the measures from the social support questionnaire across the three social support conditions and both genders.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Condition</th>
<th>Perceived Support</th>
<th>Preferred Support</th>
<th>Positive Phrases</th>
<th>Negative Phrases</th>
<th>Total Support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Female</td>
<td>None</td>
<td>.20</td>
<td>.45</td>
<td>10.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>Known</td>
<td>7.40</td>
<td>1.82</td>
<td>7.20</td>
<td>2.59</td>
<td>7.80</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td>3.60</td>
<td>2.41</td>
<td>8.60</td>
<td>1.34</td>
<td>2.60</td>
</tr>
<tr>
<td>Male</td>
<td>None</td>
<td>.00</td>
<td>.00</td>
<td>9.80</td>
<td>.45</td>
<td>.80</td>
</tr>
<tr>
<td></td>
<td>Known</td>
<td>9.40</td>
<td>.89</td>
<td>7.80</td>
<td>1.64</td>
<td>10.00</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td>1.80</td>
<td>1.30</td>
<td>9.60</td>
<td>.55</td>
<td>4.60</td>
</tr>
</tbody>
</table>

4.1 PERCEIVED SUPPORT:

The perceived support measure acted as a manipulation check to ensure that the participants’ could identify a difference between the three conditions of social support. Table 1 clearly shows there was a difference between conditions. The 3 (condition) way ANOVA added that there was a main effect across the three social support conditions; NS (M = 1.0), KS (M = 8.4) and US (M = 2.7) for the level of perceived support. The F-value was 135.18 which was significant at p <0.001. Table 2 illustrates that this was true for both the male and female groups.

Also, according to the ANOVA there was a significant difference between the male and female groups for the level of perceived support, where F (1, 8) = 6.83; p = 0.007. However, the post-hoc independent samples t-test revealed no significant difference for the NS (t (8) = 1.0; p = 0.347), KS (t (8) = 2.21; p = 0.058) and US (t (8) = 1.47; p = 0.18) social support conditions between the male and female groups.

4.2 PREFERRED SUPPORT:

The 3 (condition) way ANOVA test revealed that there was a main effect across the conditions for the level of preferred support; NS (M = 9.9) KS (M = 7.5) and US
(M = 9.1) where the F-value = 7.26 which is significant at p = 0.006. However, the post-hoc 2 (gender) x 3 (condition) way ANOVA revealed no significant difference between the conditions and the level of preferred support.

There was also no significant difference between the male and female groups for the level of preferred support; (F (2, 16) = 0.453; p = 0.643).
Table 2: Comparisons between the different social support conditions (none, known and unknown) for both the male and female groups.

<table>
<thead>
<tr>
<th></th>
<th>Perceived Support</th>
<th>Preferred Support</th>
<th>Positive Phrases</th>
<th>Negative Phrases</th>
<th>Total Support</th>
<th>PPO</th>
<th>MPO</th>
<th>FI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Diff</td>
<td>Sig</td>
<td>Mean Diff</td>
<td>Sig</td>
<td>Mean Diff</td>
<td>Sig</td>
<td>Mean Diff</td>
<td>Sig</td>
</tr>
<tr>
<td>Female N v K</td>
<td>-7.20</td>
<td>0.03</td>
<td>2.80</td>
<td>0.07</td>
<td>-7.80</td>
<td>0.00</td>
<td>-5.20</td>
<td>0.00</td>
</tr>
<tr>
<td>N v U</td>
<td>-3.40</td>
<td>0.00</td>
<td>1.40</td>
<td>0.08</td>
<td>-2.60</td>
<td>0.19</td>
<td>5.60</td>
<td>0.05</td>
</tr>
<tr>
<td>K v U</td>
<td>3.80</td>
<td>0.00</td>
<td>-1.40</td>
<td>0.36</td>
<td>5.20</td>
<td>0.02</td>
<td>-3.40</td>
<td>0.26</td>
</tr>
<tr>
<td>Male N v K</td>
<td>-9.40</td>
<td>0.00</td>
<td>2.00</td>
<td>0.08</td>
<td>-9.20</td>
<td>0.04</td>
<td>4.40</td>
<td>0.02</td>
</tr>
<tr>
<td>N v U</td>
<td>-1.80</td>
<td>0.04</td>
<td>0.20</td>
<td>0.37</td>
<td>-0.20</td>
<td>0.85</td>
<td>-0.60</td>
<td>0.59</td>
</tr>
<tr>
<td>K v U</td>
<td>7.60</td>
<td>0.00</td>
<td>-1.80</td>
<td>0.09</td>
<td>9.00</td>
<td>0.00</td>
<td>-5.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

N = None, K = Known, U = Unknown, PPO = Peak Power Output, MPO = Mean Power Output, FI = Fatigue Index; Mean Diff = Mean Difference.
4.3 POSITIVE PHRASES:

Figure 1 illustrates that there was a main effect across the three conditions for the frequency of positive phrases; the ANOVA revealed that $F = 35.475$ which is significant at $p < 0.001$. When the data was split by gender, it was found that actually there was no significant difference between the KS condition and the US condition for the frequency of positive phrases for both the female ($p = 0.19$) and male ($p = 0.85$) groups. Though, the KS condition produced significantly more positive phrases than the NS condition (Female: $p < 0.001$) (Male: $p = 0.04$) as did the KS compared to the US (Female: $p = 0.02$) (Male: $p < 0.001$), this can be seen in Table 1.

Figure 1 shows that there was a small difference between the genders, however the 2 (gender) x 3 (condition) way ANOVA revealed that this was not a significant difference as $F_{(2, 16)} = 2.127; p = 0.152$.

Figure 1: Mean and Standard Deviation for the frequency of positive phrases circled in the social support questionnaire for each of the social support conditions.
4.4 *NEGATIVE PHRASES:*

There was a main effect for condition \((F_{(2, 16)} = 35.48; p < 0.001)\) which was shown from the 3 (condition) way ANOVA for the frequency of negative phrases in each condition. However, the 2 (gender) x 3 (condition) way ANOVA showed there was no significant difference between the NS (Female \(M = 5.80 \ SD = 3.71\)) (Male \(M = 1.0 \ SD = 2.12\)) and the US (Female; \(M = 2.60 \ SD = 2.19\) vs. Male; \(M = 5.20 \ SD = 1.10\)) conditions for both the female \((p = 0.05)\) and male groups \((0.59)\) as can be seen in Table 1. There was a significant difference between the NS and KS (Female; \(M = 0.20 \ SD = 0.45\) s. Male; \(M = 0.20 \ SD = 2.07\)) for both genders and the KS and US for the male group only. (See table 2)

Again, there was no main effect for gender across the three conditions of social support as \(F_{(2, 16)} = 2.426; p = 0.120\). Figure 2 shows that the mean value for the KS condition is very similar between the male \((M = 0.20)\) and female \((M = 0.20)\) groups, hence no significant difference between genders.

![Figure 2: Mean and Standard Deviation for the frequency of negative phrases in the social support questionnaire for each of the social support conditions.](image-url)
4.5 TOTAL SUPPORT:

There is a significant difference between the total amount of support reported by the participants across the three social support conditions, ignoring gender, $F_{(2, 16)} = 49.194; p < 0.01$. The 2 (gender) x 3 (condition) way ANOVA revealed that the KS condition had a significantly higher total support result than the NS condition, hence a significant difference for both the female ($p = 0.03$) and male ($p < 0.001$) groups. The difference between the KS and US conditions was also significant for both the female ($p = 0.01$) and male ($p < 0.001$) groups. However, there was no significant difference for total support when comparing the NS and US conditions between either of the genders.

There is no main effect for gender and the total amount of support; $F_{(2, 16)} = 1.713; p = 0.212$. This is especially true for the US condition where the male and female groups both have a mean of 24.60 and $t_{(8)} = 0.0; p = 1.0$. The KS condition was close to having a significant difference with $t_{(8)} = 2.278; p = 0.052$. This is clearly illustrated in Table 1.
Table 3: Means and Standard Deviations for the PPO, MPO and FI for the male and female groups across the three social support conditions.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Condition</th>
<th>PPO M</th>
<th>PPO SD</th>
<th>MPO M</th>
<th>MPO SD</th>
<th>FI M</th>
<th>FI SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>None</td>
<td>440.48</td>
<td>76.83</td>
<td>373.58</td>
<td>67.82</td>
<td>32.06</td>
<td>4.40</td>
</tr>
<tr>
<td></td>
<td>Known</td>
<td>524.86</td>
<td>76.27</td>
<td>434.16</td>
<td>53.52</td>
<td>34.80</td>
<td>4.43</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td>427.48</td>
<td>75.12</td>
<td>375.86</td>
<td>68.62</td>
<td>25.54</td>
<td>5.35</td>
</tr>
<tr>
<td>Male</td>
<td>None</td>
<td>951.80</td>
<td>101.52</td>
<td>733.40</td>
<td>33.39</td>
<td>43.56</td>
<td>12.57</td>
</tr>
<tr>
<td></td>
<td>Known</td>
<td>1066.86</td>
<td>59.44</td>
<td>811.26</td>
<td>42.11</td>
<td>44.30</td>
<td>5.77</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td>964.44</td>
<td>110.39</td>
<td>725.70</td>
<td>47.38</td>
<td>45.96</td>
<td>5.55</td>
</tr>
</tbody>
</table>

NB: PPO = Peak Power Output, MPO = Mean Power Output, FI = Fatigue Index, M = Mean and SD = Standard Deviation.

4.6 PEAK POWER OUTPUT (PPO):

Figure 3 illustrates that there was a main effect for PPO across the three conditions where $F = 11.15$ which was significant at $p < 0.001$. The KS (Female; $M = 524.86$ SD = 76.27 vs. Male; $M = 1066.86$ SD = 59.44) condition had a significantly higher PPO than the NS (Female; $M = 440.48$ SD = 76.83 vs. Male M; = 951.80 SD = 101.52) condition for both the male ($p = 0.50$) and female ($p = 0.38$) groups. This is shown in Table 3. However the US condition (Female; $M = 427.48$ SD = 75.12 vs. Male; $M = 964.44$ SD = 296.67) showed no significant difference with the NS condition for the male ($p = 0.79$) and female ($p = 0.27$) groups. For the two social support conditions; KS and US there was no significant difference for the male group. However there was a significant difference in the female group as $p = 0.001$.

There was a significant difference between the male and female groups’ PPO. This is apparent in the post-hoc independent samples t-test for all three of the conditions: NS ($t_{(8)} = 8.980; p < 0.001$), KS ($t_{(8)} = 12.53; p < 0.001$) and US ($t_{(8)} = 8.99; p < 0.001$).
4.7 MEAN POWER OUTPUT (MPO):

The 2 (gender) x 3 (condition) way ANOVA test results show that there was a main effect for both the condition and gender when considering the MPO, this is shown in Figure 4. The condition is significant at $F(2,16) = 21.39; p < 0.001$. When the ANOVA was split by gender the pairwise comparison revealed that the significant difference for condition stemmed from the difference between the NS condition and the KS condition for both the male ($p = 0.017$) and female ($p = 0.034$) groups. The means and standard deviations are demonstrated in Table 3. Furthermore the difference between the KS and US conditions was significant for both the male ($p = 0.029$) and female ($p = 0.009$) groups. However, there was no significant difference between the NS and US conditions for either of the male ($p = 0.552$) and female ($p = 0.861$) groups.

Similar to PPO, the independent samples t-test for the MPO showed that there was a significant difference between the male and female results for all three of the social support conditions. NS condition $t(8) = 10.64; p < 0.001$, KS condition $t(8) = 12.38; p < 0.001$ and US condition $t(8) = 9.38; p < 0.001$. 

Figure 3: Mean and Standard Deviation for the Peak Power Output (PPO) in the Wingate Anaerobic Cycle tests for the three social support conditions.
**Figure 4: Mean and Standard Deviation for Mean Power Output (MPO) in the Wingate Anaerobic cycle Tests in three social support conditions (None, Known and Unknown).**

### 4.8 FATIGUE INDEX (FI):

The FI is the only set of results for which there was no main effect across the condition, regardless of gender; $F_{(2, 16)} = 1.79; p = 0.198$. However when the ANOVA was repeated but this time split by gender it showed that, in fact, there was a significant difference for the female group when NS was compared to US ($p = 0.01$) and KS was compared to US ($p = 0.01$) were compared, this is shown in Table 2.

The 2 (gender) x 3 (condition) way ANOVA results also showed that there was a significant difference between the male and female FI’s for each of the three conditions. The post-hoc independent samples t-test revealed that this difference was a result of the US condition where the male group ($M = 45.96$, $SD = 5.55$) had a higher FI than the female group ($M = 25.54$, $SD = 5.35$) and $t_{(8)} = 5.92; p < 0.001$. Also, for the KS condition the male ($M = 44.30$, $SD = 2.299$) FI was significantly higher than the females ($M = 34.800$, $SD = 2.299$) and $t_{(8)} = 2.92; p =$
0.019. Finally, no significant difference was found between FI of the male and female groups for the NS condition; $t_{(8)} = 5.921; p < 0.001$. 
CHAPTER V

DISCUSSION:
The following section explains the results produced from this study and recognises the limitations that provide incentives for further research. The purpose of this study was twofold. Firstly to investigate how different social support conditions affect fitness test performance and secondly to identify whether the way genders interpret different social support conditions varied. Based on a variety of research it was hypothesized that the KS and US conditions would produce different perception and performance results in comparison to the NS condition. Due to limited previous research no difference was hypothesized between the KS and US conditions as these were both types of received support. It was believed that there would be gender differences across the three social support conditions, again, for both the performance and perception measures. The findings show some support for these hypotheses, though a few of the results came as a surprise. The main finding from the study revealed that social support can have both a psychological and physiological effect upon exercise performance, this is in line with Freeman and Rees (2008) who understood that social support could be associated with both physical and mental processes.

5.1 PSYCHOLOGICAL: The social support questionnaire highlighted the level of perception of social support across the three conditions. From the results, there was no evidence to back up the hypothesis that the NS and US conditions would produce different opinions of social support and that there would be no difference between the two social support conditions (KS and US). It is believed that the KS condition may have acted as a dissociation strategy, focusing the attention of the participant away from the pain and discomfort of the Wingate Anaerobic cycle Test (Andreacci et al. 2002) allowing them to work harder. It was hypothesized that this, too, would be true for the US condition but as the supporters were not present in the room the distraction was most probably decreased resulting in a similar result to the NS condition. The encouragement used was always of a positive nature such as ‘Excellent!’ and ‘You are doing really well!’ According to Andreacci et al. (2002) these positive reinforcers can benefit the exercise response and aid the participant to maintain a maximal effort. This explains why the KS condition caused the participants to label the support as more positive than the other conditions. Furthermore, some of the encouragement was instructional such as
'Keep going!' and 'Push harder!' Instructional commands such as these are thought to lead to an increased response effort as it is in our nature to follow instructions/commands (Andreacci et al. 2002). Again, these were most prominent in the KS condition where the support was personal and arguably more specific, leading to the most positive perception and opinion of social support. One reason for the US condition not producing the positive effects that were hypothesised is linked to the belief that the relationship between the provider and recipient must be strong and accustomed (Gottlieb, 2000) in order to have a positive effect. Additionally, the US condition was labelled as distracting and annoying by the participants. This is known as cognitive interference, which can prevent the participants from focusing on the performance task. It is possible for this cognitive interference to occur in the KS condition too; however the support was very encouraging potentially reversing the effects to allow the participants to be task-focused. This agrees with Freeman and Rees (2010) who found that both perceived and received support reduced the effects of cognitive interference.

It was identified that the social support questionnaire results from the NS condition were negative and illustrated a low perception of support for this condition. According to Freeman and Rees (2010), if the participants were to have a high level of perceived support then the intervention of social support would not have affected the performance of the participants. Hence, for this study the manipulation of social support positively affected the performance in the Wingate Anaerobic cycle Test, as the participants had a low level of perceived support. Freeman and Rees (2007) found that social support may impact the cognitive appraisal process. This explains why the participants performed better in the KS (received) condition as they would have felt that they were more able to cope with the acute stress of the Wingate Anaerobic cycle Test and would have seen it as more of a challenge. Furthermore, it is believed that esteem support is associated with an increased self-confidence, again leading to a better performance (Freeman and Rees, 2007).

5.2 PHYSIOLOGICAL: The results from the Wingate Anaerobic cycle Test revealed the effect of social support upon performance. The presence of social
support from people with whom the recipient is familiar with enabled the performer to produce a higher PPO and MPO compared to US providers or if there was no support at all. However, the FI increased with the addition of support; this evidence shows that the level of social support cannot reduce or reverse the effects of fatigue. These results are in line with Andreacci et al. (2002) who found that verbal encouragement can have a positive effect on performance in maximal fitness tests. Earlier literature (McNair, 1996) explains that encouragement leads to an increase in muscular strength, hence the increase in PPO and MPO in the KS condition. However, Amagiani et al. (2012) found opposing results in that there was no difference in the performance of a Wingate Anaerobic cycle Test across a concurrent verbal encouragement condition and a no verbal encouragement condition. This study was only carried out on females, comparing athletes to non-athletes, which is one explanation for the different results.

5.3 GENDER: These results suggest that there is no difference in the way males and females perceive social support. This did not agree with the hypothesis stating that males and females would respond differently to the three conditions. However, Abrahamsen et al. (2008) found that esteem support (provided in this study) produced no significant difference between male and female elite handball players, providing support for these findings. However, Abrahamsen et al. (2008) also suggested that males are more ego orientated whilst females are more task orientated. Hence, suggesting that the difference between the NS and KS conditions would be higher for males than for females. This is because males would thrive when being supported by peers, whereas females would prefer not to be watched whilst performing and would take part for intrinsic reasons. This is true for the performance and social support questionnaire measures in this study. Although no difference was found between the genders, it was believed that this was an important comparison to make as there was no previous literature that explained a direct relationship. Many studies included either males or females or used mixed gender groups.

5.4 LIMITATIONS: It is important to make note of the limitations in this study to spur future research and reduce the risk of similar faults being repeated. Firstly, there were only ten participants (5 male, 5 female) which created a small sample size. This may have been due to the stressful nature of the Wingate Anaerobic
cycle Test. Although it is not time consuming (30secs x 3) it is a maximal fitness test and may have put volunteers off taking part. Secondly, for the KS condition there was only four supporters. To get a realistic response the room should have been full with supporters. However, this was hard to achieve as the supporters had to be chosen by the participant, hence four supporters were used in the study. The most important fact for this condition was that they were familiar to the participant and that they had been chosen to provide the support by the participant. Thirdly, and perhaps most importantly, the ‘unknown’ support was provided through headphones. This meant that there was not actually anyone watching the participants performing, so lacked reliability. To get four (or more) supporters who were ‘unknown’ to the participant would have been hard without providing an extrinsic reward to gain further volunteers to attend and provide support. Also as the support was pre-recorded it was not specific and personal to each participant; though it was positive and encouraging. This most likely explains why the US condition produced results similar to the NS condition rather than the KS condition as was hypothesised.

5.5 PRACTICAL IMPLICATIONS: From a performance perspective, the results from this study demonstrate the importance that the procedures for maximal fitness tests (such as the Wingate Anaerobic cycle Test and VO₂ max) are based on providing ‘known’ supporters to allow the participants to get closer to their true max. From this study, it is clear that participants do not reach their true max when they are not being supported and encouraged. Secondly, participants who partake in fitness tests alone in the gym are most likely underachieving. If they were to have known supporters as opposed to other gym users who are unknown then their results would improve. Thirdly, the data from this study can be used by trainers/teachers to encourage people to partake in sport and to make it enjoyable. The participants painted a positive image of their experience in the KS condition despite working harder and fatiguing at a quicker rate.

5.6 FUTURE RESEARCH: Future research should focus on providing a more realistic US condition where the researcher recruits the supporters to be present in the room. It is also important to spread this research across other populations
such as children and elite performers. Another avenue for research could be to see how positive support compares to negative feedback during exercise performance, though this may prove difficult to gain ethical consent. Interestingly in this research the female participants chose four female supporters and the male participants chose four male supporters in the KS condition. This may have been a coincidence, however it does show that performers would prefer to be watched and supported by their own gender. Hence, an interesting future research prospect would be to have males supporting females and females supporting males and compare performance to mixed gender groups and same gender groups.

5.7 CONCLUSION: The main conclusion from this research follows that having supporters who are familiar to the participant present whilst carrying out a maximal fitness test results in an improved performance compared to when there is no support or if the supporters are unknown to the participant. This is true for both males and females equally. The reason for this increase in performance is due to a range of psychological processes; mainly that the support bolsters the participants’ self-esteem and distracts the participants from the pain that the test is causing allowing them to work harder.
CHAPTER VI

REFERENCES


APPENDICES
APPENDIX A

PARTICIPANT INFORMATION FORM
**Participant Information Sheet:**

**Project Title:** To investigate the effects of social support on performance in a Wingate anaerobic cycle test.

This document contains any details you will require, including:

- Background and aims of research
- My role as the researcher
- Your role as the participant
- How data will be collected
- How the data/research will be used
- Your rights
- Protection to privacy
- Contact

**Background and aims of research:** To extend the progress in performance of athletes it is crucial for them, and their team, to know and understand the environment which promotes optimal performance. This is especially important in the area of fitness testing to ensure the results are true and valid. It is apparent that performance can be affected by social support, which leads to the aim of this study. The research will illustrate how perceived and received support effect performance and if there is a difference between male and female preference.

**My role as the researcher:** I will be conducting three 30 seconds Wingate anaerobic cycle tests with you, an appointment schedule will be created so that you can carry out your testing at a time which best suits you as the participant and you will have at least one week for recovery.

**Your role as the participant:** Your role is to let me know which time slot suits you on the schedule and to turn up at that time. Each session will last no more than 15 minutes and will include a briefing before you start, a gentle three minute warm up, a 30 second Wingate test and finally a three minute cool down. You will be required to partake in three of these sessions should you volunteer for the study, they will be carried out one week apart.

**How data will be collected:**

**How the data/research will be used:** By volunteering to partake in my study you are agreeing for your results to be used within a greater spread of data. However your name and other personal details will remain anonymous within the research paper and instead participant 1-20 will be used.
**Your rights:** If you volunteer to take part in my study, you will have the right to withdraw at any time. Therefore, you are not under any control and can act as you feel comfortable.

**Protection to privacy:** Your name and other personal details will not be published in any written research and will remain confidential.

**Contact:** It is possible that you will have some further details you may require, if so please do not hesitate to contact me.

Zoe Kier  
*Cardiff School of Sport*  
*Cardiff Metropolitan University*  
*CF23 6XD*  
*ST10001450@cardiffmet.ac.uk*
APPENDIX B
PARTICIPANT CONSENT FORM
INFORMED CONSENT:

**Title of Study:** To investigate the effects of social support on performance in a Wingate anaerobic cycle test.

Please complete as you feel comfortable and appropriate:

1) I confirm that I understand everything in the participant information sheet for this study and I have been given time to ask questions and think about taking part

2) I recognize that I have the chance to withdraw at any point should I want to and that I am taking part as a voluntary participant

3) I know that should I wish to withdraw I do not have to give a reason and my relationship with Cardiff Metropolitan University will not be affected.

4) I believe that the results from the study may be published, but my identity will remain entirely anonymous.

5) I agree to take part in this study; titled above

Participants

Name…………………………………………………………………………………………………………………………………….

Signature……………………………………………………………………………………………………………………………….

Date…………………………………..

Name of researcher collecting consent……………………………………………………………………………………………………..

Signature of researcher collecting consent………………………………………………………………………………………………..

Date………………………………….
APPENDIX C

PHYSICAL ACTIVITY READINESS QUESTIONNAIRE
Physical Activity Readiness Questionnaire (PAR-Q)

PAR-Q is designed to help you help yourself. Many health benefits are associated with regular exercise, and the completion of PAR-Q is a sensible first step to take if you are planning to increase the amount of physical activity in your life.

For most people, physical activity should not pose any problems or hazard. PAR-Q has been designed to identify the small number of adults for whom physical activity might be inappropriate or those who should have medical advise concerning the type of activity most suitable for them.

Common sense is your best guide in answering these few questions. Please read the carefully and check **YES** or **NO** opposite the question if it applies to you. If yes, please explain.

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Has your doctor ever said you have heart trouble? If yes, please state:</td>
<td></td>
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<tr>
<td>2. Do you frequently have pains in your heart and chest? If yes, please state:</td>
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<tr>
<td>3. Do you often feel fain or have spells of severe dizziness? If yes, please state:</td>
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<td>4. Has a doctor ever said your blood pressure was too high? If yes, please state:</td>
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<tr>
<td>5. Has your doctor ever told you that you have a bone or joint problem(s), such as arthritis that has been aggravated by exercise, or might be made worse with exercise? If yes, please state:</td>
<td></td>
<td></td>
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<tr>
<td>6. Is there a good physical reason, not mentioned here, why you should not follow an activity program even if you wanted to? If yes, please state:</td>
<td></td>
<td></td>
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</tbody>
</table>
7. Are you or have you been pregnant in the last 6 months?

8. Do you suffer from any problems of the lower back, i.e., chronic pain, or numbness?
   If yes, please state:

9. Are you currently taking any medications? If YES, please specify.

10. Do you currently have a disability or a communicable disease? If yes, please state:

If you answered NO to all questions above, it gives a general indication that you may participate in physical and aerobic fitness activities. The fact that you answered NO to the above questions, is no guarantee that you will have a normal response to exercise. If you answered Yes to any of the above questions, then you may need written permission from a physician before participating in physical and aerobic fitness activities.

______________________        _____________________        _________________        
Print Name                          Signature                          Date
Social Support Questionnaire:

I am interested in how you feel the level of social support affected you during the Wingate test. Please answer honestly to the questions below:

1. How did you perceive the level of support in this test? (tick the line)

   None  Medium  Maximum

2. Would you have preferred support? (tick the line)

   Less  About right  More

3. I found the level of social support: (circle as many as you like)

   Positive  Distracting
   Facilitative  Useful
   Intimidating  Restless
   Honest  Helpful
   Friendly  Annoying
   Lively  Miserable
   Lifeless  Cheerful
   Active  Gloomy
   Depressing  Good Natured
   Energetic  Helpful
   Panicking  Irritating
   Relaxing  Inspiring
   Helpful  Distressing
   Believable  Scary
   Sympathetic  Enthusiastic
-2 = strongly disagree, -1 = slightly disagree, 0 = No preference, 1 = slightly agree, 2 = strongly agree

4. The level of social support gave me a positive feeling?  
   
5. Did the level of social support annoy you?  
   
6. It bothers me to think that others are evaluating my performance when watching me?  
   
7. Whilst others are watching me I feel anxious about my performance?  
   
8. It relaxes me to know that people are watching me perform?  
   
9. The level of support made me unable to concentrate on my performance?  
   
10. I felt the level of support gave me confidence in my performance?