

Investigating the Relationship Between Self-Talk Engagement and Performance Anxiety in
GAA Players

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Abstract

The purpose of the present study was to examine the relationship between self-talk engagement and performance anxiety in GAA Players, while also exploring the gender differences within these variables. Research has shown that engaging in self-talk can reduce athletes' performance anxiety levels. The present study sought to expand upon these findings and strengthen them by investigating a new group of GAA Players. A total of 183 participants completed questionnaires measuring their self-talk engagement and performance anxiety. Findings from a multiple regression analysis revealed that motivational self-talk/cognitive self-talk was significantly predictive of performance anxiety. Follow up MANOVAs showed that females are significantly higher in somatic anxiety, worry, and concentration disruption than males. Males scored higher in cognitive self-talk than females, but females scored higher in motivational self-talk than males. Implications for this study and best practices for measuring and researching self-talk and performance anxiety in GAA Players are discussed.

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Introduction

“Self-talk is the most powerful form of communication because it either empowers your or defeats you.” – Wright Thurston

Recently, self-talk has received more attention in the literature on sport psychology, and interestingly new research has been investigating the relationships between cognition and behaviour in sport (Hatigeorgiadis & Galanis, 2017; Moran, 2014). Moran (2014) explains that an individual might believe that their body and physical strength are the main characteristics that you use in sport to win, but your mind and mental strength can be just as strong, or even stronger. Moran (2014) also states that athletes have long been known to talk to themselves while training and competing. In sport psychology, the term self-talk is broadly defined as “verbalizations addressed to one’s self (Latinjak et al., 2019), and can be split into motivational self-talk (concerning increased effort and positive mood) and instructional self-talk (concerning performance technique) (Theodorakis et al., 2000).

Performance anxiety in sport is commonly defined as an unpleasant psychological response to the perceived pressure of a task (Cheng et al., 2009) and is also often split into two components; somatic anxiety (physiological response, e.g., feeling nauseous) and cognitive anxiety (e.g., worry and apprehension), (Weinberg & Gould, 2015). The potential impact of sports performance anxiety has received a wealth of attention within the literature, with many conceptualizing anxiety models such as but not limited to the U hypothesis (Yerkes & Dodson, 1908), the drive theory (Hull 1943) and the catastrophe model (Hardy, 1990). Research has also found some possible determinates of sport performance anxiety such as team over individual sports (Pluhar et al., 2019), coach athlete relationship (Barber & Sukhi, 2008), and gender (O’Donoghue & Neil, 2015).

Brief History of Self-Talk

Hackfort and Schwenkmezger (1993) describe self-talk as “an internal dialogue the individual interprets feelings and perceptions, regulates and changes evaluations and conviction, and gives him/herself instructions and reinforcement” (p. 355). During the end of the 20th century, comprehensive research on self-talk had emerged (Van Raalte et al., 1994; Weinberg et al., 1984). Hardy et al. (1996) state that research on self-talk encountered multiple difficulties, due to ambiguous definitions and lack of theory to support self-talk. Over the years, self-talk has been defined in numerous ways across multiple publications (Latinjak et al., 2019). Hardy and Zourbanos (2016) gave a new definition of self-talk as “statements, phrases, or cue words that are addressed to the self which might be said automatically or strategically, either out loud or silently, phrased positively or negatively, having an instructional or motivational purpose, an element of interpretation, and incorporating some of the same grammatical features associated with every day speech” (p. 450). In other words, self-talk is the small voice in your head (Hardy, 2006; Latinjak, Zourbanos, López-Ros, & Hatzigeorgiadis, 2014; Theodorakis, Weinberg, Natsis, Douma, & Kazakas, 2000; Van Raalte, Vincent, & Brewer, 2016). The definitions of self-talk previously mentioned will help with further research for the other variables in this study???

Self-Talk in Sport Settings

Self-talk in various sports such as cycling, soccer, badminton, basketball, strokes and volleying skills in tennis, figure skating, cross-country skiing, tennis, and sprinting has been found to be beneficial towards athletes' cognitions, attentional focus, concentration confidence, mood, and performance in training and matches (Blanchfield, et al., 2014; Harvey et al., 2002; Hatzigeorgiadis et al., 2009; Johnson-O'Conner, & Kirschenbaum, 1982; Landin & Hebert, 1999; Mallet & Hanrahan, 1997; Ming & Martin, 1996; Perkos et al., 2022; Theodorakis, et al., 2000; Smith & Johnston, 2000; Rushall et al., 1988; Weinberg, Grove, & Jackson, 1992; Zervas, et al., 2007; Ziegler, 1987; Zinsser et al., 1998). It is

important to distinguish the different types of self-talk and the functions of self-talk that will be used in this study. Firstly, Zervas et al., (2007) reveal that self-talk can be positive or negative. Positive self-talk is described as using affirmations or encouragement to achieve success, such as “Good job, do it again” (Hardy et al., 2001; Weinberg, 1988), while negative self-talk is described as self-critical, unnecessary, and counterproductive statements that gets in the way of an athlete’s performance, such as “Stupid mistake” (Theodorakis et al., 2000; Hardy et al., 2001) In relation to self-talk in sport, it has been found that athletes’ use more positive self-talk than negative self-talk (Rotella et al., 1980; Hardy et al., 2001). There has been contrasting views on the true effect of negative and positive self-talk. Notably, negative self-talk has been associated with higher anxiety levels, such as fear of failure during matches when athletes make mistakes (Conroy & Metzler, 2004; Latinjak et al., 2016). Contrastingly, negative self-talk has been found to be associate with improved performance (Highlen & Bennett, 1983). Due to conflicting results from studies on positive and negative self-talk, recent self-talk research has moved towards motivational and cognitive self-talk (Hatzigeorgiadis et al., 2004).

Secondly, according to Hardy et al., (2001) motivational and cognitive are the two main functions of self-talk. The Self-Talk Questionnaire (S-TQ) has a subscale that measures motivational self-talk engagement in athletes. One of the statements is as follows: “*I talk to myself to enhance my self-confidence.*” Hocaoglu et al., (2022) argue that it is important for everyone, especially athletes to maintain a positive morale. Motivational self-talk is a mental skill that athletes use to psych themselves up, enhance confidence, control arousal levels, which will ultimately lead to enhanced performance in training and competitions (Bellomo, et al., 2020; Hardy, et al., 1996; Hardy, et al., 2018; Theodroakis, et al., 2000; Zervas, et al., 2007). One study investigated the difference of effectiveness between instructional and motivational self-talk in free-kick takers in GAA. They found that the players who used

motivational self-talk performed significantly better than those who used instructional self-talk (Hardy, et al., 2015). Another study revealed that most athletes favour motivational self-talk over cognitive/instructional self-talk (Zervas et al., 2007). Many studies have all agreed that engaging in self-talk such as motivational and instructional reduces anxiety levels in sports (Georgakakiv & Karakasidou, 2017; Hatzigeorgiadis, Zourbanos, Mpoupaki & Theodorakis, 2009). Cognitive self-talk is another mental skill that allows athletes to solve problems, focus on attention, and mastering a new skill (Bandura, 1977; Hocaoglu, et al., 2022). Mallet & Hanrahan (1997) found that cognitive/instructional self-talk improved a 100m sprint performance at national level by a significant 2%. In relation to performance anxiety, many researchers found that both motivational and cognitive/instructional self-talk reduces interfering thoughts, which ultimately enhanced performance (Hatzigeorgiadis, Theodorakis, & Zourbanos, 2004; Hatzigeorgiadis, Zourbanos, & Theodorakis, 2007).

Performance Anxiety

Anxiety is a crucial concept in understanding the many emotions in sport, because it is strongly linked to performance (Jones, 1995; Raglin & Hanin, 2000; Woodman, et al., 2009). In sport psychology, the study of anxiety, its causes, how it interacts with other psychological factors, and its effects have long received theoretical and empirical attention (Baker et al., 2000; Jones, 1995; Koehn, 2013; Hamidi & Besharat, 2010; Martens, et al., 1990; Smith, et al., 2006). Anxiety is a complicated negative emotion with a wide range of cognitive, physiological, and behavioural symptoms (Gray, 1991; Martens, et al., 1990; Raghunathan & Pham, 1999; Smith & Ellsworth, 1985). According to the Attentional Control Theory, anxiety impairs an individual's cognitive processing, concentration and results in worry and despair (Hallion, et al., 2017). Liu, et al., (2021) assert that all of these factors can impair an athletes' performance. For example Brooks (2014) explained that people may feel anxious prior to crucial tasks such as public speaking or a job interview. In relation to sport, Duda (1998)

reveals that athletes view anxiety as having a detrimental impact on their performance.

Anxiety and performance are closely related, and is the most universal emotion that every athlete experiences (Jones, 1995; Liu, et al., 2021; Raglin & Hanin, 2000; Woodman, et al., 2009). Research suggests that, anxiety significantly affects many athletes' performance (Cox, Qiu, et al., 1993; Ranglin & Hanin, 2000; Ortiz, 2006; Weinberg & Gould, 2010). Many athletes experience anxiety and worry before and even throughout the game (Brooks, 2014; Eysenck, 1992; Frame & Reichin, 2019). Anxiety can also rise during an athlete's performance due to a succession of mistakes and an increase in worry about their performance (Frame & Reichin, 2019). This can ultimately harm athletes' cognition, self-confidence and overall performance (Brooks, 2014; Eysenck, 1992).

Somatic anxiety. Taylor (1987) reveal that in order for athletes to perform at their best, a certain amount of physiological arousal is essential. Unfortunately, an excessive amount of arousal can be harmful (Yerkes & Dodson, 1908; Sonstroem & Bernardo, 1982). Performance anxiety is divided into two components: cognitive and somatic anxiety (Borkovec, 1976; Davidson, 1978). Building on from this, Martens et al. (1990) developed the Multidimensional Theory of Competitive Anxiety which provides a definition for each component. The physical manifestation that results from autonomic arousal is known as somatic anxiety (Frame & Reichin, 2019; Martens, et al., 1990; Mellalieu, Hanton, & Fletcher, 2006). Some physiological symptoms that athletes may experience during tournaments, competitions, or any other situation that is perceived as threatening is nervousness, irregular breathing, high blood pressure, a dry throat, tense muscles, rapid heartrate, sweaty palms and 'butterflies in the stomach' (Duicâ, et al., 2014; Frame & Reichin, 2019; Indries & Bochis, 2019; Jarvis, 2002; Jones, 2000; Maretns, et al., 2009). The famous quote from Canadian Olympic Basketball coach Jack Donohoe provides the best explanation of the positive and negative effects of precompetitive anxiety in athletes: "it's not

a case of getting rid of the butterflies, it's a matter of getting them to fly in formation" (Orlick, 1986, p. 112). From the above the SAS-2 has a subscale that measures somatic anxiety in athletes. One of the statements is as follows: "*My body feels tense*".

Worry. Worry is another common component of performance anxiety that all athletes experience (Burton, 1998; Eysenck & Berkum, 1992). Borkovec (1994) states that worrying is characterized by an individual's negative thinking. Worry has been defined as a series of negative thoughts and images about competition (Burton, 1998; Borkovec et al., 1983). For example, Matthews (1990) explains that worry is most prevalent when an individual's focus is on any perceived threats in the environment. In addition, the SAS-2 has a subscale that measures worry in athletes. One of the statements is as follows: "*I worry that I will mess up during the game*".

Concentration Disruption/Attentional Control. Concentration/attentional control is another factor that impacts an athlete's overall performance (Liu et al., 2021). Mella et al., (2020) reveal that problems in attentional control arise when an individual struggles to focus on their goals.. Concentration disruption is defined as "concentration problems in which distractions prevent appropriate attentional focus" (Burton, 1998, p. 131). For example, in an early study of expert and novice shooters, Gates (1918) reported that novice shooters performed worse when focusing on distracting thoughts (e.g., "I can't seem to control myself" or "There, I moved again") than expert shooters. Similar findings were made by Sade et al., (1990), who reported lower levels of anxiety in expert shooters than novice shooters. In addition, the SAS-2 has a subscale that measures concentration disruption in athletes. One of the statements is as follows: "*I have a hard time focusing on what my coach tells me to do*". Moreover, according to the attentional control theory, anxiety usually disrupts the brain's stimulus processing and concentration power (Hallion et al., 2017)

On the other hand, anxiety can also motivate athletes to perform better. Wilkinson (2003) revealed that “The responsibility as England’s kicker does scare me. I worry all the time about it, but the important thing is that I know I can worry about it. It’s not a bad thing, or a detrimental thing, to worry. As long as when I go to take the kick, my routine is there, and my visualization, I can be fearful as I like and think; I’m really, really concerned about this, but as long as everything is in place, the ball will go where you want it to” (p. 47). Mellalieu et al., (2006) explain that the goal-kicker for the England Rugby Union team, Johnny Wilkinson, demonstrates the idea that performance-related worries may not always have a negative outcome in performance. Additionally, the first study to challenge the idea that all anxiety is bad in competitions was by Mahoney and Avenier (1977). They compared gymnasts who qualified and did not qualify for the 1976 Olympics and evaluated their psychological skills they experiences. The results revealed that the gymnasts who qualified used their anxiety as a stimulant to achieve a better performance.

Gender differences in Self-Talk (Motivational and Cognitive/Instructional) and Performance Anxiety (Somatic Anxiety, Worry, and Concentration Disruption). There is limited research on self-talk and anxiety levels in performance around soccer, and most studies focus on male football players (Kaplánová, 2021; Kristjánsdóttir, Jóhannsdóttir, Pic, & Saavedra, 2019). According to a study conducted with elite handball players, women typically reported higher levels of anxiety than males (Kristjánsdóttir, Erlingsdóttir, Sveinsson & Saavedra, 2018). Additionally, Lunqvist et al., (2011) found that elite female swimmers reported significantly higher anxiety levels than their male counterparts. In particular many studies have reported that female athletes from sports such as basketball, futsal, handball, volleyball, soccer, and tennis reported higher levels of somatic anxiety and worry compared to male athletes (Freire et al., 2020; Kristjánsdóttir et al., 2018; O’Donoghue & Neil, 2015; Dias et al., 2010; Ramis et al., 2015). However, Jones et al., (1991) argued that

there was no gender differences in somatic anxiety. Hagan et al., (2017) supported this conflicting result and found that female athletes reported less cognitive and somatic anxiety than male athletes. Finally, Grossbard et al., (2009) mentioned that concentration disruption between gender in athletes have somewhat conflicting results. Coreira and Rosado (2016) found that female athletes reported higher levels of concentration disruption than males athletes. On the other hand Grossbard et al., (2009) found that female athletes reported less concentration levels than male athletes. Interestingly Freire et al., (2020) found that both males and females had low concentration disruption scores. The conflicting results between somatic anxiety, worry, and concentration disruption could be related to the different sports that was explored within the previously mentioned study. Different sports have different levels of intensity, mental strength, fitness, and skill level which may have different effects on their somatic anxiety, worry, and concentration disruption levels.

Self-Talk Questionnaire and Sports Anxiety Scale -2

There has been evidence of the validity of the S-TQ. In Zervas et al., (2007) study regarding the development of the scale found that athletes with high self-talk scores will display high levels of cognitive appraisal which supports future research to investigate the relationship with self-talk scores (motivational and cognitive) and performance anxiety (somatic anxiety, worry, and concentration disruption).

Following on from the research and empirical findings that have been discussed above, the Sport Anxiety Scale (SAS; Smith et al., 1990) was developed. The 21-item scale measures individual distinctions in somatic anxiety, cognitive anxiety, worry and concentration disruption (Dunn et al., 2000; Smith et al., 1990). Evidently, the SAS appears to be an accurate and valid measure of cognitive and somatic sports performance anxiety, and has been beneficial to researchers (Giacobbi & Weinberg, 2000; Johnson et al., 2005; Smith

et al., 2000). Smith et al. (2006) updated the SAS in a sample of young athletes and college students in response to criticism of the scales' psychometric properties. Smith et al., (2006) detected 15 items that represented the worry, somatic anxiety, and concentration disruption experienced by the young athletes and renamed the new scale as SAS-2. The SAS-2 originated as a competitive trait anxiety measure based on the multidimensional anxiety theory (Martens et al., 1990). It includes three subscales, one for "somatic anxiety" and two subdivisions of cognitive anxiety: "worry" and "concentration disruption" (Van Biesen et al., 2020).

The current study

There is great interest in investigating differences in types of self-talk from several independent variables such as age, gender, experience, and level of sport (Hardy, et al., 2001; Zervas, et al., 2007). Subsequent research should examine the potential relationships between the S-TQ and other psychological characteristics such as anxiety, intrinsic motivation, self-confidence, positive thinking, concentration, and skill learning. Zervas et al., (2007) encouraged future researchers to conduct future research to investigate the relationships between athletes self-talk and their performance in training and competitive environment. According to Van Raalte et al., (1994), "physiological variables such as heart rate associated with match play would contribute to a more sophisticated analysis of the relationship between self-talk and match performance" (p. 413). Therefore, the purpose of this current study is to investigate the relationship between self-talk engagement and performance anxiety in GAA players, while also exploring gender differences.

Aims and Hypothesis

Research Question 1: Is there any predictive relationship between levels of each type of self-talk and levels of each component of performance anxiety

H1: Higher levels of motivational self-talk are associated with lower levels of somatic anxiety

H2: Higher levels of motivational self-talk are associated with lower levels of worry

H3: Higher levels of motivational self-talk are associated with lower levels of concentration disruption

Research Question 2: Is there significant gender differences in motivational and cognitive self-talk?

H4: Males have higher levels of motivational self-talk than females

H5: Males have higher levels of cognitive self-talk than females

Research Question 3: Is there significant gender differences in somatic anxiety, worry, and concentration disruption?

H6: Females have higher levels of somatic anxiety than males

H7: Females have higher levels of worry than males

H8: Females have higher levels of concentration disruption than males

Methodology

Participants

The initial sample consisted of 183 individuals. 2 individuals were excluded from the analyses as they were under the age of 18 and were not eligible for participation in the study. Participants were recruited from different GAA clubs from several counties in Ireland (Dublin, Kerry, Kildare, Laois, Louth, Meath and Westmeath). The final sample then, comprised of 181 individuals (99 males and 82 females), with a mean age of 24.12 years ($SD = 6.46$) ranging from 18 to 45. 8.3% played GAA at both club and intercounty (15) and 91.7% played GAA at club level (166). It is important to note that the majority of participants did not receive any self-talk interventions (84%). We didn't have sufficient numbers to conduct a group comparison and it may have had an impact on results, so future research should look to get equal numbers for the groups to carry out the analysis.

A MANOVA was conducted in this study, G*Power: Statistical Power Analyses (Faul, Erdfelder, Buchner, & Lang, 2009) was used to determine the sample size required for a statistically powerful analysis. In line with ethical considerations, participants were required to be over the age of 18 and are actively playing GAA. They were also required to provide informed consent before completing the questionnaire.

Materials

Both of the self-talk definitions mentioned earlier The study questionnaire was comprised of demographic questions and 2 scales using Google forms. The demographic questions were administered to gain a general profile of the participants in this study, such as the participant's gender, age, how many years of playing GAA, what level of GAA they play at and if they ever received any self-talk interventions.

Self-Talk Questionnaire. The Self-Talk Questionnaire (ST-Q; Zervas, Stavrou, & Psychountaki, 2007) a 11-item self-report measure, was used to determine participants' engagement of self-talk to enhance their sporting performance during training or matches. Participants read 11 statements and rated them on a 5-point Likert Scale from 1 (never) to 5 (always). The scale also consisted of two sub-scales that measured Motivational Self-Talk (7-items), as well as Cognitive Self-Talk (4-items). An example of an item relating to Motivational Self-Talk is as follows: *I talk to myself to increase my effort*. An example of an item relating to Cognitive Self-Talk is as follows: *I talk to myself in order to be able to concentrate more fully on the competition*. No items were needed to be reverse scored. The Self-Talk Questionnaire has empirically demonstrated high levels of reliability and validity over time (Zervas et al., 2007). According to Zervas et al., (2007) the Self-Talk Questionnaire has good internal consistency with a Cronbach alpha coefficient reported of .92. In the current study, the Cronbach alpha coefficient for the Self-Talk Questionnaire was .89. The Cronbach alpha coefficient for Motivational and Cognitive Self-Talk were .87 and .79 respectively.

Sports Anxiety Scale-2. The Sports Anxiety Scale-2 (SAS-2; Smith, Smoll, Cumming, & Grossbard, 2006) a 15-item self-report measure, was used to determine performance anxiety in athletes during training or matches. Participants read 15 statements and rated them on a 4-point Likert Scale from 1 (not at all) to 4 (very much). The scale also consisted of 3 sub-scales that measured Somatic Anxiety (5-items), Worry (5-items), as well as Concentration Disruption (5-items). An example of an item relating to Somatic Anxiety is as follows: *My stomach feels upset*. An example of an item relating to Worry is as follows: *I worry that I will mess up during the game*. Finally, an example of an item relating to Concentration Disruption is as follows: *I cannot think clearly during the game*. No items were needed to be reverse scored. The Self-Talk Questionnaire has empirically demonstrated

high levels of reliability and validity over time. The Sports Anxiety Scale 2 has good internal consistency, with a Cronbach alpha coefficient of .85 (Smith et al., 2006). Hashim (2008) reported an acceptable reliability for each of the subscales (Cronbach's $\alpha = 0.78$ for somatic anxiety, 0.83 for worry, and 0.75 for concentration disruption). One limitation in Hashim (2008) was the sample size. This current study will look at these variables with a much larger sample size of 181 GAA players. Additionally, Grossbard, et al., (2009) reported that all subscale scores were substantially correlated with one another (Somatic with Worry = .64; Somatic with Concentration Disruption = .62; Worry and Concentration Disruption = .63). In the current study, the Cronbach alpha coefficient for the Sports Anxiety Scale-2 was .90. The Cronbach alpha coefficient for Somatic Anxiety, Worry, and Concentration Disruption were .78, .93, and .84 respectively.

Design

The current study used a quantitative approach with an observational approach. To investigate all hypotheses, a between-participants design was used. The independent variables were motivational and cognitive self-talk, while somatic anxiety, worry, and concentration disruption were the dependent variables.

Procedure

The majority of study participants were recruited through social media platforms. The questionnaire was uploaded to Instagram and sent into group chats. Some were recruited by mutual friends whereby the questionnaire link was directly sent to them by email. The rest of participants were recruited by contacting the secretaries from over 350 GAA clubs, who then would encourage the managers to send in the link to the survey with the adult teams. Once participants accessed the link they were brought to the Participant Information Sheet detailing

the nature and purpose of the study, the researcher, the supervisor, and the requirements for eligibility in participating (see Appendix 3).

The participants were then brought to the consent form (see Appendix 4) where they were made aware that all of their data will be confidential and only used for research purposes and will not be shared with other parties. The participants were also made aware that anytime during the questionnaire they refuse to participate, they can withdraw their participation by exiting the browser. At the end of the consent form the participant will tick a box giving their consent that they have read and agree with the information given in the consent form and agree to participate. This will then take the participant to the start of the study.

The participant will be asked to answer a few demographic questions. Next, the participant will complete the S-TQ questionnaire (see Appendix 1) which will ask the participants to report how often they use self-talk before or during games using sample statements. In the SAS-2 questionnaire (see Appendix 2), the participant will select which number best represents how they feel before or during games. After completing the 2 questionnaires the participant will be brought to a debriefing form (see Appendix 5) where they will be made aware of helplines or any additional support if they wish to receive support if they become distressed about their involvement of the study. Also on this page was the researcher's and supervisor's contact details. This survey will take the participant 5-10 minutes to complete.

Ethical considerations

All data was collected within accordance with the ethical guideline of NCI and is in line with The Psychological Society of Ireland Code of Professional Ethics (2010). Though no direct distress or harm was expected to be experienced by any participants during the

study, the debriefing form includes a helpline in the event that any participant experienced any distress by the material presented.

Results

Descriptive Statistics

The study consisted of 183 participants. There were 100 males (54.6%) and 83 females (45.4%) and ranges in ages of 18 to 45, with a mean of (24.04) and standard deviation of (6.47). The participants were all from GAA clubs in Dublin, Kerry, Kildare, Laois, Louth, Meath, and Westmeath and had an average of 15 years playing GAA. The majority of participants played at club level (91.8%) and did not receive any self-talk interventions (84.7%). The complete descriptive statistics are listed below

Table 1

Descriptive statistics for all categorical variables: Gender, Level of GAA, and Self-Talk Intervention

Variable	Frequency	Valid %
Gender		
Male	100	54.6%
Female	83	45.4%
Level of GAA		
Club	168	91.8%
Both	15	8.2%
Self-Talk Intervention		
Yes	28	15.3%
No	155	84.7%

Means (M) and standard deviations (SD) for all continuous variables are presented in Table 2. Participants had a mean age of 24.04 years (SD = 6.467), ranging from 18 to 45 and participants had a mean number of 15.68 years (SD = 6.52) playing GAA, ranging from 2 to 35 years.

Table 2

Descriptive statistics for S-TQ, TotMOT, TotCOG, SAS-2, TotSOMAX, TotWY, and TotCONDNS

Variable	<i>M</i> [95% CI]	<i>SD</i>	Range
Self-Talk Questionnaire	37.00 [35.69, 38.31]	8.96	11-55
Sports Anxiety Scale -2	37.30 [36.00, 38.60]	8.90	17-60
Total Motivational	23.52 [22.61, 24.43]	6.26	7-35
Total Cognitive	13.48 [12.96, 14.00]	3.55	4-20
Total Somatic Anxiety	12.72 [12.23, 13.20]	3.30	5-20
Total Worry	12.86 [12.39, 13.34]	3.28	5-20
Total Concentration Disruption	11.72 [11.29, 12.16]	2.98	5-20
Age	24.04 [23.10, 24.98]	6.47	18-45
Years playing GAA	15.68 [14.73, 16.63]	6.52	2-35

Inferential Statistics

Multiple regression analyses was performed to determine how well motivational function could be explained by the following predictor variables, total concentration

disruption, total worry, and total somatic anxiety. Preliminary analyses showed no violation of the assumptions of normality, linearity, and homoscedasticity. The correlations between the predictor variables and criterion variable included in the model were examined. All three variables were significantly correlated with the criterion variable, the correlation between both predictor variables was also significant (See table 3). Tests for multicollinearity indicated that all Tolerance and VIF values were in an acceptable range and indicated that there was no violation of the assumption of multicollinearity and that the data was suitable for examination through multiple linear regression analysis.

No *a priori* hypotheses had been made to determine the order of entry of the predictor variables, therefore, a direct method was used for data analysis. Both predictor variables entered in the model explained 11% of variance in somatic anxiety, worry, and concentration disruption levels ($F(3, 179) = 1.726, p < .005$). All variables entered in the model were found to uniquely predict somatic anxiety, worry, and concentration disruption levels to a statistically significant level.

Table 4

Multiple regression model predicting Motivational Functioning.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	75.973	3	25.324	.642	.000 ^b
Residual	7055.710	179	39.417		
Total	7131.683	182			

**Note Dependent Variable: total motivational function*

Predictors: (Constant), total concentration disruption, total worry, total somatic anxiety

Table 5

Regression Coefficients of somatic anxiety, worry & concentration disruption on motivational Function.

	B	Std. Error	Beta	t	Sig.
(Constant)	3.6**	2.011		11.530	.000
total somatic anxiety	-.069	.285	-.036**	-.240	.001
total worry	-.239	.252	-.125**	-.947	.001
total concentration disruption	.364	.292	.173*	1.249	.002

*Dependent Variable: total motivational function

A one-way between-groups multivariate analysis of variance was performed to investigate gender difference in self-talk. Two dependent variables were used: motivational and cognitive self-talk. The independent variable was gender. Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices, and multicollinearity, with no serious violations noted. There was a statistically significant difference between gender on both motivational self-talk and cognitive self-talk, Wilks' Lambda = .025. There was a statistically significant difference between gender for motivational function $F(1, 181) = 9.80; p < .002$; partial $\eta^2 = .051$. An inspection of the mean scores indicated that males reported lower levels of motivational self-talk ($M = 22.23; SD = 6.14$) than females ($M = 25.07; SD = 6.08$). A statistically significant difference between gender for cognitive function $F(1, 181) = .006; p < .001$; partial $\eta^2 = .000$. An inspection of the mean scores indicated that females reported lower levels of cognitive self-talk ($M = 13.46; SD = 3.51$) than males ($M = 13.50; SD = 3.60$).

A one-way between-groups multivariate analysis of variance was performed to investigate gender difference in performance anxiety. Three dependent variables were used: somatic anxiety, worry, and concentration disruption. The independent variable was gender. Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices, and multicollinearity, with no serious violations noted. There was a statistically significant difference between gender and total somatic anxiety $F(1,181) = 21.38; p < .0005; \text{partial } \eta^2 = .106$. An inspection of the mean scores indicated that males reported lower levels of somatic anxiety ($M = 11.47; SD = 3.56$) (See Appendix B for more details) than females ($M = 13.89; SD = 2.84$). There was a statistically significant difference between gender and total worry $F(1,181) = 11.35; p < .001; \text{partial } \eta^2 = .059$. An inspection of the mean scores indicated that males reported lower levels of worry ($M = 12.14; SD = 3.34$) than females ($M = 13.73; SD = 3.0$). There was a statistically significant difference between gender and total concentration disruption $F(1,181) = 15.16; p < .001; \text{partial } \eta^2 = .077$.

Table 6

MANOV statistics for gender differences between motivational self-talk and cognitive self-talk, somatic anxiety, worry, and concentration disruption

	Effect	Value	F	df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.975	1361.223 ^b	5.000	177.000	.000	.975
	Wilks' Lambda	.025	1361.223 ^b	5.000	177.000	.000	.975
	Hotelling's Trace	38.453	1361.223 ^b	5.000	177.000	.000	.975
	Roy's Largest Root	38.453	1361.223 ^b	5.000	177.000	.000	.975
Gender	Pillai's Trace	.190	8.321 ^b	5.000	177.000	.000	.190
	Wilks' Lambda	.810	8.321 ^b	5.000	177.000	.000	.190

Hotelling's Trace	.235	8.321 ^b	5.000	177.000	.000	.190
Roy's Largest	.235	8.321 ^b	5.000	177.000	.000	.190
Root						

a. Design: Intercept + Gender

b. Exact statistic

Discussion

In the current study, the relationship between self-talk engagement and performance anxiety was explored within an Irish context. The current study sought to provide a greater understanding of self-talk engagement and performance anxiety. Self-talk is a universal experience (Fields, 2002; Vygotsky, 1934). Self-talk is another form of communication that people interpret their emotions, perceptions, and beliefs (Hackfort & Schwenkmezger, 1993). In relation to sport, many studies agree that self-talk has a significant effect in improving attentional focus, confidence, effort, and controlling cognitive and emotional reactions. The level of competitiveness and its intensity in today's sports has dramatically escalated in the past 20 years, which places greater demands on athlete's physical and mental wellbeing (Fu & Fu, 2022). Athletes compete against one another not just on a technical level, but also on a psychological level (Fu & Fu, 2022). The evidence clearly shows that all athletes experience varied psychological states which ultimately determine their overall performance (Fu & Fu, 2022).

Walter et al., (2019) mention that previous studies have concentrated on participants in as many as eight different sports, therefore it is possible that different sports require various psychological abilities. Furthermore, this current study will focus on one type of sport (GAA) to reduce the heterogeneity of the sample, while also investigating gender differences within each variable.

In support of the first hypothesis, results showed that motivational self-talk was a significant predictor of somatic anxiety. The second hypothesis was also supported; results showed that motivational self-talk was a significant predictor of worry. In support of the third hypothesis, results showed that motivational self-talk was a significant predictor of concentration disruption. In support of the fourth hypothesis, results showed that males did not have levels of motivational self-talk than females. This suggests that females have a greater tendency to engage in motivational self-talk as opposed to males. In support of the fifth hypothesis, results showed that males had higher levels of cognitive self-talk than females. This suggests that males have a greater tendency to engage in cognitive self-talk as opposed to females. In support of the sixth hypothesis, results showed that

females had higher levels of somatic anxiety as opposed to males. This suggests that females experience higher levels of somatic anxiety than males. In support of the seventh hypothesis, results showed that females had higher levels of worry as opposed to males. This suggests that females experience higher levels of worry than males. In the final hypothesis, results showed that females had higher levels of concentration disruption as opposed to males. This suggests that females experience higher levels of concentration disruption than males.

Research has investigated the efficacy of self-talk interventions when the athlete is trained in the use of self-talk (Hatzigeorgiadis, et al., 2011), therefore in this case, future research could implement self-talk interventions for GAA clubs at both club and intercounty level. This study did not have sufficient time to investigate the longitudinal effects of self-talk on GAA players, therefore, future research should examine this possibility. Another limitation was unreliable numbers between level of sport (playing at club or both club and intercounty level). Subsequent research should investigate the effects of self-talk under competitive pressure for club and intercounty GAA players.

Another limitation that the current study had was the use of self-report measures on both scales. Such measures increases the chance of self-selecting bias, which means that some of the answers may not be reflect exactly how the individual was feeling at the time. Also, the participants were asked to reflect on past experiences of self-talk engagement and performance anxiety they experienced during training and matches, which may impact overall results. Therefore, as previously mentioned a longitudinal design would be more appropriate. In addition to this, future research should implement a control group to measure self-talk engagement and performance anxiety in GAA players as a longitudinal design.

There is enough sufficient research and evidence that strongly suggests that the way in which athletes talk to themselves is negatively impacting on their overall performance. Therefore, the practical implications of this study are that training in self-talk and performance anxiety should be administered to both managers and players to challenge negative self-talk and its unwanted outcomes. Broader implications are that the GAA (Gaelic Athletic Association) and the LGFA (Ladies Gaelic

Football Association) could benefit from creating self-talk and performance anxiety workshops, so that every GAA club in Ireland could implement these skills into their training and matches.

“A healthy mind and healthy body complement each other” – Liu et al., (2021)

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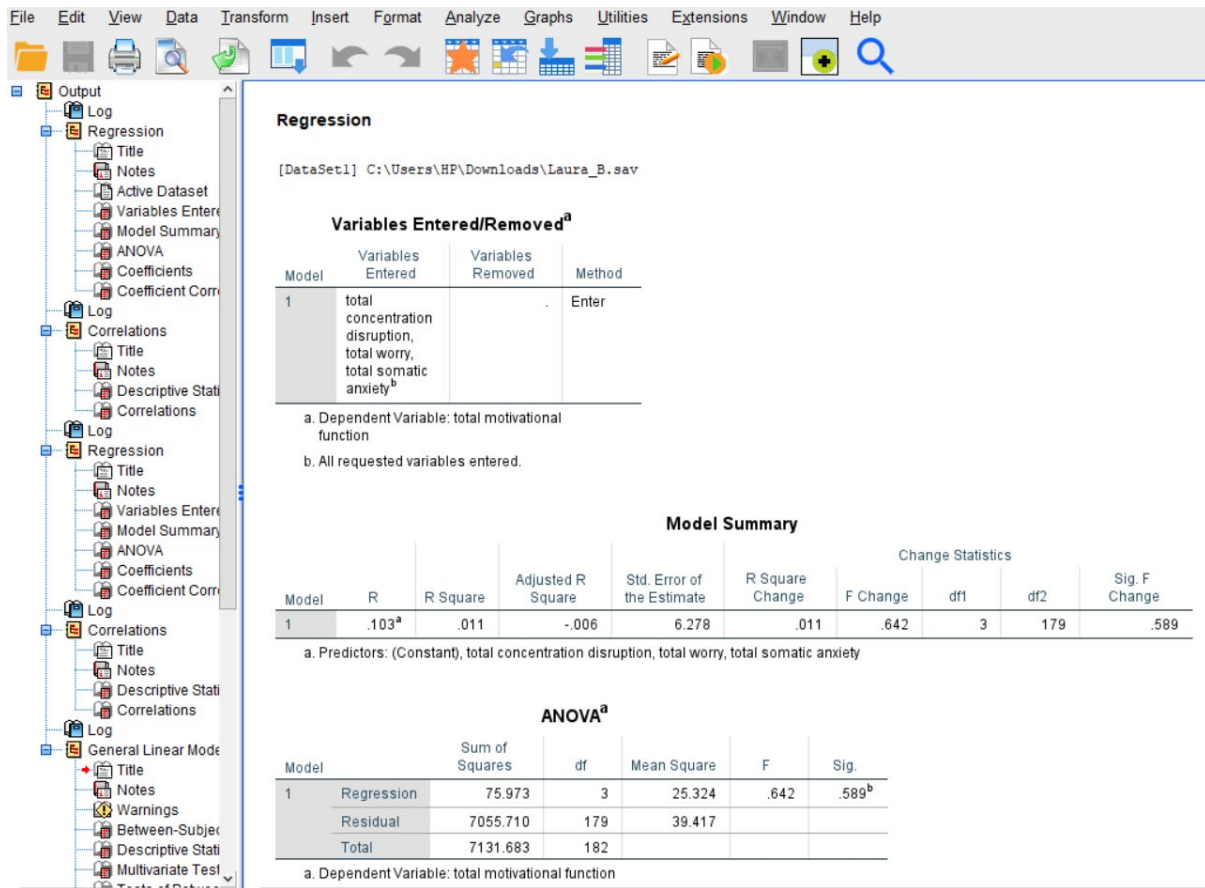
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Appendices

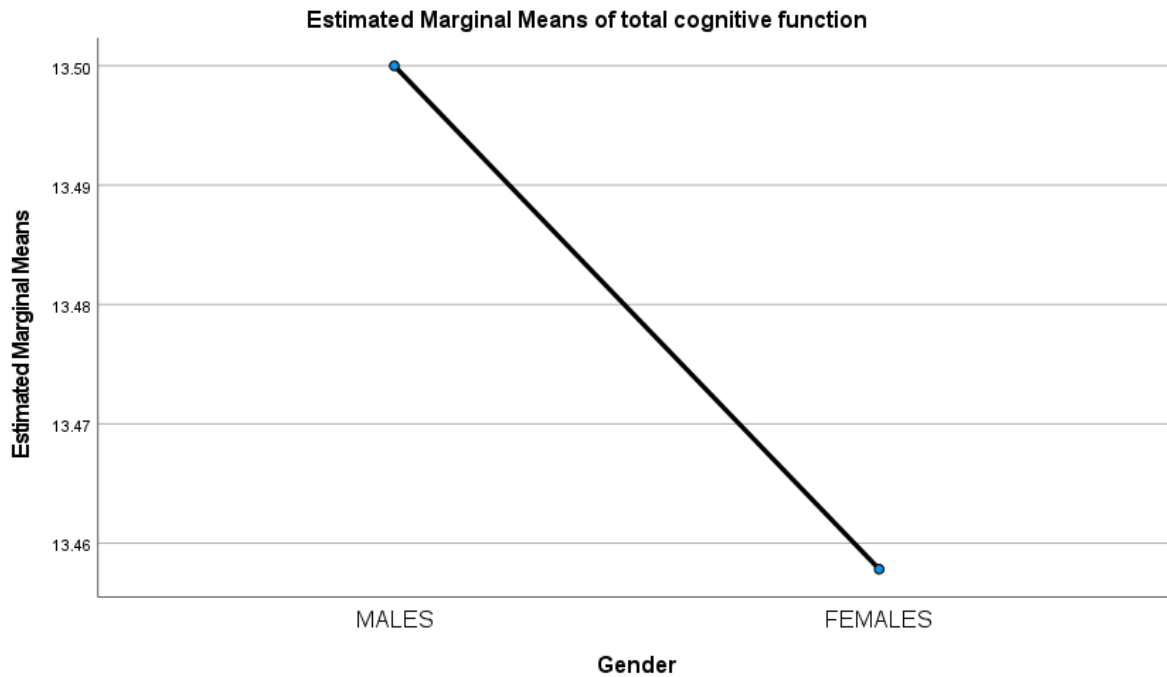
Appendix A

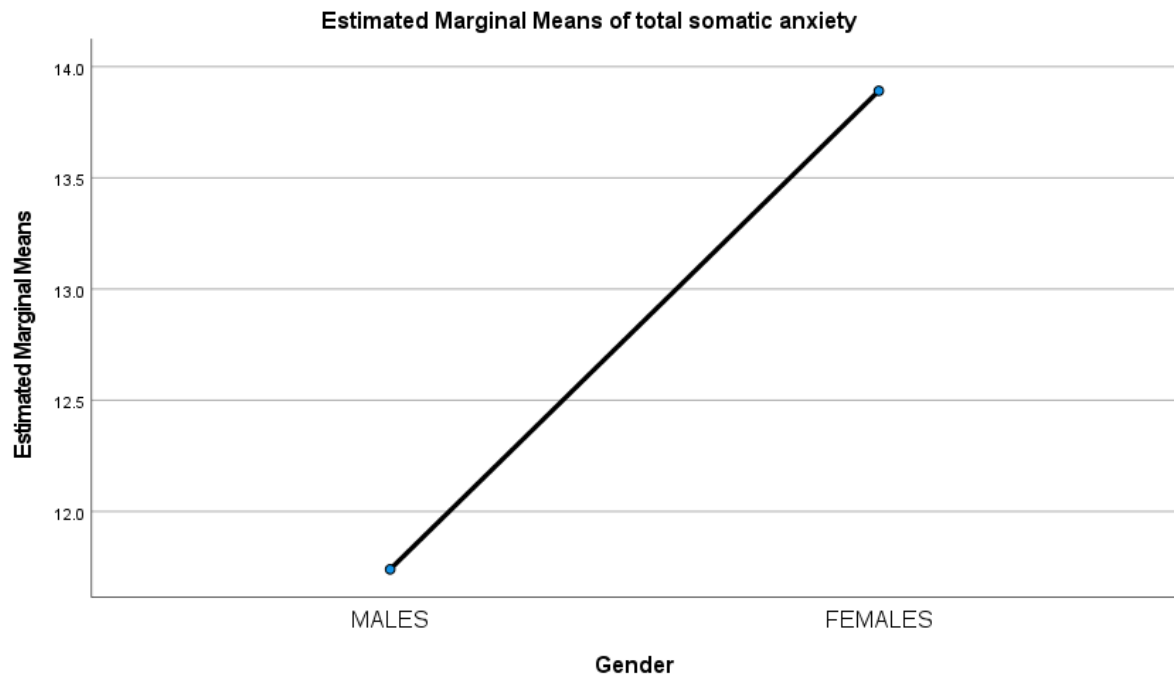
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	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Gender	Numeric	6	0	Gender	{1, MALES}...	None	14	Right	Nominal	Input
2	Age	Numeric	3	0	Please state yo...	None	None	12	Right	Scale	Input
3	Level_	Numeric	8	0		None	None	8	Right	Nominal	Input
4	Level	String	26	0	At what level do...	{1, CLUB}...	None	17	Left	Nominal	Input
5	YearsPlaying	Numeric	21	0	How many year...	None	None	21	Right	Scale	Input
6	STI	String	8	0	Have you ever r...	{1, YES}...	None	11	Left	Nominal	Input
7	STI_	Numeric	8	0		{1, YES}...	None	8	Right	Nominal	Input
8	stq1	Numeric	2	0	1. I talk to myse...	{1, Never}...	None	12	Right	Ordinal	Input
9	stq2	Numeric	2	0	2. I talk to myse...	{1, Never}...	None	12	Right	Ordinal	Input
10	stq3	Numeric	2	0	3. I talk to myse...	{1, Never}...	None	12	Right	Ordinal	Input
11	stq4	Numeric	2	0	4. I talk to myse...	{1, Never}...	None	12	Right	Ordinal	Input
12	stq5	Numeric	2	0	5. I talk to myse...	{1, Never}...	None	12	Right	Ordinal	Input
13	stq6	Numeric	2	0	6. I talk to myse...	{1, Never}...	None	12	Right	Ordinal	Input
14	stq7	Numeric	2	0	7. I talk to myse...	{1, Never}...	None	12	Right	Ordinal	Input
15	stq8	Numeric	2	0	8. I talk to myse...	{1, Never}...	None	12	Right	Ordinal	Input
16	stq9	Numeric	2	0	9. I talk to myse...	{1, Never}...	None	12	Right	Ordinal	Input
17	stq10	Numeric	2	0	10. I talk to mys...	{1, Never}...	None	12	Right	Ordinal	Input
18	stq11	Numeric	2	0	11. I talk to mys...	{1, Never}...	None	12	Right	Ordinal	Input
19	sas1	Numeric	2	0	1. My body feel...	{1, Not at all...	None	12	Right	Ordinal	Input
20	sas2	Numeric	2	0	2. I feel tense i...	{1, Not at all...	None	12	Right	Ordinal	Input
21	sas3	Numeric	2	0	3. My muscles f...	{1, Not at all...	None	12	Right	Ordinal	Input
22	sas4	Numeric	2	0	4. My stomach f...	{1, Not at all...	None	12	Right	Ordinal	Input
23	sas5	Numeric	2	0	5. My muscles f...	{1, Not at all...	None	12	Right	Ordinal	Input
24	sas6	Numeric	2	0	6. I worry that I ...	{1, Not at all...	None	12	Right	Ordinal	Input
25	sas7	Numeric	2	0	7. I worry that I ...	{1, Not at all...	None	12	Right	Ordinal	Input
26	sas8	Numeric	2	0	8. I worry that I ...	{1, Not at all...	None	12	Right	Ordinal	Input
27	sas9	Numeric	2	0	9. I worry that I ...	{1, Not at all...	None	12	Right	Ordinal	Input
28	sas10	Numeric	2	0	10. I worry that I ...	{1, Not at all...	None	12	Right	Ordinal	Input
29	sas11	Numeric	2	0	11. It is hard to ...	{1, Not at all...	None	12	Right	Ordinal	Input
30	sas12	Numeric	2	0	12. It is hard for...	{1, Not at all...	None	12	Right	Ordinal	Input
31	sas13	Numeric	2	0	13. I lose focus...	{1, Not at all...	None	12	Right	Ordinal	Input



Appendix B





Appendix C

Self-Talk Questionnaire (ST-Q)

Below are some statements that describe athletes' self-talk during an important competition. Please read each one carefully and indicate how often you have used self-talk during training or matches. Your answers will be collected on a likert scale. 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always

1. I talk to myself in order to be able to concentrate more fully on the competition
2. I talk to myself about the technical elements of the competition
3. I talk to myself to give directions
4. I talk to myself to enhance my self-confidence
5. I talk to myself to motivate myself
6. I talk to myself to increase my effort
7. I talk to myself to encourage myself

8. I talk to myself to strengthen a positive thought
9. I talk to myself to stop negative thinking
10. I talk to myself in order to help myself to relax
11. I talk to myself to correct my mistakes

Appendix D

Sports Anxiety Scale-2 (SAS-2)

A number of statements that athletes have used to describe their thoughts and feelings before or during competition are listed below. Read each statement and then select the appropriate response to indicate how you feel prior to or during competition. Responses range from 1 = Not at all, 2 = Somewhat, 3 = Moderately So, 4 = Very Much. Some athletes feel they should not admit to feelings of nervousness or worry, but such reactions are actually quite common, even among professional athletes. To help us better understand reactions to competition, we ask you to share your true reaction with us. There are, therefore, no right or wrong answers. Do not spend too much time on any one statement but choose the answer which describes how you commonly react.

1. My body feels tense
2. I feel tense in my stomach
3. My muscles feel shaky
4. My stomach feels upset
5. My muscles feel tight because I am nervous
6. I worry that I won't play well
7. I worry that I will let others down
8. I worry that I will not play my best

9. I worry that I will play badly
10. I worry that I will mess up during the game
11. It is hard to concentrate on the game
12. It is hard for me to focus on what I am supposed to do
13. I lose focus on the game
14. I cannot think clearly on the game
15. I have a hard time focusing on what my coach tells me to do

Appendix E

Participation Information Sheet

You are being invited to take part in a research study. Before deciding whether to take part, please take the time to read this document. The following information contains a detailed description as to why this research is being done and what it would involve for you. If you have any questions about the information provided, please do not hesitate to contact me using the details at the end of this sheet. Thank you!

WHO AM I AND WHAT IS THIS STUDY ABOUT?

I am Laura, a final year student in the BA Psychology programme at the National College of Ireland. As part of our degree we must carry out an independent research project in our final year. For my project, I aim to investigate the relationship between self-talk engagement and performance anxiety in GAA players. This project is supervised by Dr. Lynn Farrell.

WHO CAN TAKE PART?

You can take part in this study if you are aged over 18 and are currently actively involved in playing GAA at either club or club and intercounty level. The researcher will also use

publicly available emails from surrounding GAA clubs, to encourage their players to participate in the study.

WHAT WILL TAKING PART IN THIS STUDY INVOLVE?

You are required to tick the consent box below to agree to participate in this study. If you decide to take part in this research, you will be asked to complete three online questionnaires. Firstly, you will be presented with a demographic questionnaire. Next, there will be two questionnaire scales. First will be the S-TQ, followed by the SAS-2. You will be debriefed at the end of the study via a debriefing form. The questionnaire process will take you approximately 5 to 10 minutes to complete.

DO I HAVE TO TAKE PART?

Participation in this research is voluntary, and you have the right to withdraw at any stage by exiting the browser. Once you have submitted your answer from the questionnaire, it will not be possible to withdraw your data from the study, as the questionnaire is completely anonymous and your responses cannot be identified.

WHAT ARE THE POSSIBLE RISKS AND BENEFITS OF TAKING PART?

There are no direct benefits in taking part in this research. There is no paid reward. However, the information collected will help us understand more about self-talk and its effect on GAA players' performance anxiety. If you become distressed during the study, you can leave the study by exiting the browser window. There will also be a link to a helpline at the end in the debriefing form.

WILL TAKING PART BE CONFIDENTIAL AND WHAT WILL HAPPEN TO MY DATA?

The questionnaire is completely anonymous. It is not possible to identify a participant based on their responses to the questionnaire. All data collected for the study will be treated in the strictest confidence. Only the researcher and supervisor will have access to the data collected. Responses to the questionnaire will be fully anonymised and stored securely in a password protected/encrypted file on the researcher's computer. Data will be retained and managed in accordance with the NCI data retention policy. This anonymised data will be archived on an online data repository and the data won't be deleted after 5 years as it and may be used for secondary data analysis. The secondary analysis would take place in the National College of Ireland data collection archives. However, no participants will be identifiable at any point.

WHAT WILL HAPPEN TO THE RESULTS OF THE STUDY?

The results of this study will be presented in my final dissertation and oral presentation which will be submitted to the National College of Ireland. The results of the project may be presented at conferences and/or be submitted to an academic journal for publication.

WHO SHOULD I CONTACT FOR FURTHER INFORMATION?

If you have any further questions regarding any aspects of the study please do not hesitate to contact myself or my supervisor.

-Laura Baxter: x20501209@student.ncirl.ie

-Dr. Lynn Farrell: Lynn.Farrell@ncirl.ie

Thank you!

I have read this information and would like to continue

Appendix F

Consent Form

In agreeing to participating in this research I understand the following:

- The method proposed for this research project has been approved in principle by the Departmental Ethics Committee, which means that the Committee does not have concerns about the procedure itself as detailed by the student. It is, however, the above-named student's responsibility to adhere to ethical guidelines in their dealings with participants and the collection and handling of data.
 - If I have any concerns about participation, I understand that I may refuse to participate or withdraw at any stage by exiting my browser.
 - I understand that once my participation has ended, that I cannot withdraw my data as it will be fully anonymised.
 - I have been informed as to the general nature of the study and agree voluntarily to participate.
 - All data from the study will be treated confidentially. The data from all participants will be compiled, analysed, and submitted in a report to the Psychology Department in the School of Business.
 - I understand that my data will be retained and managed in accordance with the NCI data retention policy, and that my anonymised data will be archived on an online data repository and may be used for secondary data analysis. No participants data will be identifiable at any point.
 - At the conclusion of my participation, any questions or concerns I have will be fully addressed.
- Please tick this box if you have read, and agree with all of the above information. *

- Please tick this box to indicate that you are providing informed consent to participate in this study. *
- By entering the survey, I confirm that I have read through all the information and agree to participate without coercion. *

Appendix G

Debriefing Form

The Relationship between self-talk engagement and performance anxiety in GAA players.

If you wish to contact me for any follow-up questions or concerns regarding this study please do not hesitate. Again I thank you for taking part in this study. Your participation will help my research and hopefully research in the future to raise awareness of the importance of using self-talk in sport and also your everyday life.

If you would like to receive a copy of the summary of the findings, when completed please do not hesitate to contact me.

My email: x20501209@student.ncirl.ie

Supervisors emails: Lynn.Farrell@ncirl.ie

If you experienced any distress during this study, you may find it beneficial to contact the following helpline below.

Samaritans: [Contact Us | Samaritans](#) ; Phone Number: 116123

Once again, thank you for your participation in this study!!!

