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INVESTIGATING HOW SELF-TALK AFFECTS PERFORMANCE

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Investigating How Self-Talk Affects Performance on a Balance Based Task

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Abstract

There is much existing literature that investigates the relationship between self-talk and performance, however the majority of this research is within an athletic population. This study offers insights into the relationship between performance and self-talk in a novel population, while also looking at the effects of age, gender and activity levels. 57 individuals, mainly consisting of undergraduate students from National college of Ireland participated in this study. A 30 second balance board task was used to measure participants balance ability, and the Type of Self-Talk questionnaire, developed by Araki et al (2006) was used to determine participants type of self-talk. No variations were found in scores between age, gender, activity level or type of self-talk. No significant effect of self-talk on performance was therefore detected. Limitations, including the possibility of a practice effect, were discussed. Implications for alternative strategies to self-talk in performance enhancement were discussed, and suggestions were made for future research within this topic.

Introduction

Self-talk was defined by Theodorakis et al in 2000 as "What people say to themselves, either out loud or as a small voice in their head". Self-talk is a phenomenon that is widely studied in the field of coaching and sports psychology. In 2001, Hardy, Gammage and Hall sought to describe self-talk and answer the What, Why, When and Where questions surrounding the topic of self-talk. They were successful in their aims, providing an accurate, well evidenced and concise description and explanation of self-talk. A critical review, also by Hardy, in 2006 aimed to define self-talk, the nature of self-talk, its functions and theories of self-talk (or rather lack of theory-based research and literature within the area). Hardy describes self-talk as "(a) verbalizations or statements addressed to the self; (b) multidimensional in nature; (c) having interpretive elements associated with the content of statements employed; (d) somewhat dynamic; and (e) serving at least two functions; instructional and motivational, for the athlete".

Bandura's (1977) theory of self-efficacy is often referenced when discussing self-talk, as it is a basis for many theories and ideas surrounding self-talk, being one of the first pieces of literature to mention the idea of self-talk and an inner dialogue and discussing it's functions. Much of Vygotsky's (1962, 1978, 1987) work is also cited as being the beginning of the construct of self-talk, and his theories of private speech and self-regulation contribute greatly to the studies, research and theories surrounding self-talk in the field today, such as Berk (1986) who draws from Vygotsky's ideas about private speech when looking at self-talk in relation to children's task performance. Vygotsky's idea of inner speech sparked an interest in studying self-talk and inner speech, as did Bandura's. Both works provided the basic functions, descriptions and definitions of self-talk that allowed further research to expand on this topic.

There is very little literature that looks at a “mixed” (both negative and positive) category of self-talk, and a study by Araki et. al. (2006) seems to be the only study that exists that clearly indicates this mixed self-talk as its own category. There is a need to further study the effects of mixed self-talk on performance rather than just negative and positive self-talk separately, as the effects of this type on performance are not well researched and this type may prove more effective than the use of just positive or negative self-talk alone.

In 1992, Neck and Manz researched the effect of self-talk and mental imagery on performance. The results of this paper were interesting, and they found that self-talk can be useful in research and clinical (Winsler, Fernyhough and Montero, 2009) applications. It can also have very practical real-world applications, for example Neck and Milliman in 1994 found that using constructive self-talk could enhance job perceptions of employees and also enhance their performance at work. The ideas presented in the Neck and Manz (1992) study were backed up by empirical evidence and existing literature (Ellis, 1977; Manz, 1983. 1986, 1992) and were discussed in relation to many different models of self-talk and self-leadership, including the aforementioned Bandura (1969).

There have been many studies over the past few decades that have investigated the relationship between self-talk and performance, such as Hatzigeorgiadis et. al. (2008), who found that engaging self-talk improved the performance of tennis players. Hardy, Hall, Gibbs and Greenslade (2005) found that self-talk was positively correlated with self-efficacy, but they also found that while employing self-talk techniques, it did not significantly improve or enhance performance, so some conflicting findings exist within the literature, for example Kendall, Hrycaiko, Martin and Kendall (1990) found that self-talk is effective in enhancing performance in basketball players. Gould, Hedge, Peterson and Giannini, (1989) highlighted positive self-talk as one of the more effective strategies in improving and maintaining better performance in various athletic individuals, meaning this type of intervention could be useful

when employed in populations of athletes. In 1984, Weinberg, Smith, Jackson and Gould conducted a study with almost 300 athletes to investigate the effects of association/dissociation and positive self-talk on endurance. They found that those who participated in the self-talk condition performed and endured significantly better than those in the control condition, and with such a large population these results are a good indication that self-talk is a useful tool that can be used to improve performance. A systematic review of self-talk literature by Tod, Hardy and Oliver (2011) looked at 47 studies, and found that across these studies, beneficial effects of three types of self-talk (Positive, motivational and instructional) existed in relation to performance on athletic and physical tasks. They also found that negative self-talk did not significantly impede performance across the majority of the studies. A meta-analysis by Hatzigeorgiadis et. al. (2011) examined 32 studies that investigated the effect of self-talk on performance on sport and athletic based tasks. They found that self-talk was more effective for fine motor skills, rather than gross motor skills, and that the type of self-talk (Instructional or Motivational) largely influenced the effectiveness of self-talk on performance. The meta-analysis concluded that self-talk interventions were significantly more effective on performance than interventions that did not involve self-talk, and therefore they offered a useful alternative to some traditional performance interventions, that was supported by empirical evidence from many studies with similar outcomes. Many studies look at types of sports or athletic activities, such as a study conducted by Hardy, Hall and Hardy in 2005, which found that the most common type of self-talk among athletes was generally positive. Hatzigeorgiadis, Theodorakis and Zourbanos (2004), suggested that self-talk enhances concentration on performance tasks by reducing thoughts that were unrelated to the task at hand. In sports and athleticism self-talk studies, there are three distinct types of self-talk that are often identified and used - Positive, Instructional and Motivational. The population studied in most of the literature is athletic, and

so there exists a need for research to be conducted on the effects of self-talk on performance within a non-athletic population.

The common trend that exists in literature is that positive self-talk is the most effective type of self-talk for enhancing performance, however negative self-talk does not necessarily impede performance. Many studies reflect this, for example in 2007, Hamilton, Scott and MacDougall found that interestingly, within three different self-talk interventions (self-regulated positive, assisted positive and assisted negative) individuals from all groups including the negative self-talk group improved their performance, but the biggest improvement still came from the assisted positive self-talk group. Hardy, Hall and Alexander (2001) suggested that negative self-talk may have a positive effect on performance by motivating individuals to do better, and therefore negative self-talk may often be mistaken for positive self-talk

The effects of self-talk on dynamic balance performance have been studied before, firstly by Araki, Mintah, Mack, Huddleston, Larson and Jacobs (2006). There have been other studies somewhat similar in nature to the Araki et. al. study conducted, for example Beneka et. al., 2013 and Van Dyke et. al, 2018. The results of both studies suggested that self-talk has the ability to improve balance performance in individuals when compared to a non-self-talk control group. The Araki et. al. study has yet to be replicated, and without replication the results and methods and measures used cannot be considered completely reliable and valid.

Condron, Hill, and Physio (2002) studied the effects of age on performance using a balance task, although they did not incorporate the use of self-talk in this study, it yields interesting results surrounding balance performance and age, finding that the older people became the more unstable their balance and the more likely they were to fall. It would have been interesting to see if a self-talk based intervention had the potential to strengthen the

balance in the older population on that task, which could have possible implications such as introducing self-talk based techniques to improve bad balance in older individuals, which is a risk factor for trips and falls (Boelens, Hekman & Verkerke, 2013). Vereeck, Wuyts, Truijen and Van de Heyning (2008) found that balance performance worsens with age, particularly when a person reaches their 70's, and women perform slightly worse than men, especially with older age, but it is not discussed why this is. Often studies that investigate activity levels with balance and performance (often alongside an age variable also) do so with an older population (Iverson, Gossman, Shaddeau and Turner,1990), or in the case of Pettersson, Engardt and Wahlund (2002) in individuals with Alzheimer's disease. It would be interesting to investigate all of these variables in relation to self-talk, to see if there is any effect or difference on performance within different categories of these variables when an element of self-talk is introduced, particularly in young people as balance is usually studied in older populations and so there is a gap in the literature when it comes to balance in younger individuals.

Very little research exists on the effect of self-talk on performance while looking at differences between gender, age and activity levels. Not many of the previously mentioned studies look at the differences among these variables within self-talk and performance, and none collectively look at all three, so a need is highlighted here to introduce some literature investigating the effect of self-talk on performance while incorporating these three variables. It is important to consider these variables, as their interaction and relationship with self-talk and performance has not been widely researched and therefore is largely unknown, and there could be an undiscovered relationship there that proves important to the study of self-talk and performance.

Relating to age, one interesting study, conducted by Shariati and Fazel (2013) investigated the effects of different types of self-talk on balance within what was described as

a “healthy” elderly population. Overall, across the different conditions, they found that self-talk was effective in helping participants to maintain their balance better and for longer periods of time. Boroujeni and Ghaheri (2011) studied the effects of self-talk on reaction time, and this recent study yielded interesting results that could be useful when considered in relation to time-bound balance performance studies. They found that motivational self-talk in particular can significantly decrease ones reaction time, and therefore one might think that if motivational self-talk can decrease reaction time, it may also have the ability to increase the amount of time one can hold their balance/time spent performing a task.

Going forward with the current study, the definitions of self-talk proposed by Hardy, Gammage and Hall (2001) and Theodorakis et. al. (2000) are seen as accurate, detailed and useful and so, when referring to self-talk in the current study, those definitions are how self-talk will be operationally defined. The current study will aim to partially replicate the Araki et. al. (2006) study while also providing an insight on self-talk and performance relating to differences in gender, age and activity levels in order to investigate the relationship of these variables on self-talk and performance. These variables have not been widely studied previously in this area. While the area of self-talk and its effects on performance is well recorded in previous literature, there are limitations. One such limitation is research only being carried out with specific populations such as athletic individuals, and the research also often focuses on performance on athletic tasks such as running, sports etc. Another limitation is that the existing studies within this particular area have not been replicated and therefore the methods and results cannot be compared, challenged or supported. There is an opportunity to partially replicate the study by Araki et al (2006), and a possibility to provide results that support those of the original study, therefore strengthening the reliability of the methods used and the results found. There is also the possibility that the results of the replication will challenge the results of the original study, therefore opening up discussion

about the reliability of the results and providing the basis for further research into this area of psychology. The current study could provide new insights into self-talk and its relationship with performance on a balance task in a novel population (non-athletic individuals) and provide the Araki et. al. (2006) study with either supporting results, or challenge that study, providing new data surrounding the effects of self-talk on performance on a non-athletic task, within a non-athletic population. There is also a need to study differences in self-talk and performance between gender, age and activity levels, so this study will address that need by taking into account these demographics when looking at results of the task. Another gap in the literature that will be addressed by the current study is the lack of literature that identifies mixed self-talk as a category, therefore leaving its affects and possible enhancements on performance unknown.

The current research questions are; “Is there a difference in performance between those who engage in Positive self-talk and those who engage in Negative/mixed self-talk?”, “Is there any correlation between the specific types of self-talk individuals engage in and their gender, age or activity level?” and “Is there a difference in performance scores or self-talk between genders, ages and activity levels?”. The current study aims to; 1) Investigate the effect of self-talk on performance on a balance task, 2) Identify which type of self-talk is most effective for performance and 3) Investigate whether there is a significant difference in scores across different genders, age ranges and activity levels. The current hypotheses are; “People who engage in Positive self-talk will perform better than those who engage in negative/mixed self-talk ”, “There will be a correlation between Type of self-talk and gender age and activity levels” and “Some differences in performance score will be observed between different gender, age and activity categories”.

Method

Ethics

Full ethical approval was sought and granted prior to commencement of this study. All precautions were taken to ensure participant safety and optimal wellbeing were considered and maintained throughout the duration of this study. Informed consent was necessary from all individual prior to participation. Vulnerable populations were not included in the study. Participants had the option to disembark from the study at any time with no consequence. Data was de-identified and encrypted so participants information was not placed at risk. Participants were supervised by researcher at all times throughout study. Enough space was provided in a room with a soft carpeted surface to complete the task safely, with the researcher on hand to assist anybody who lost balance.

Participants

Fifty seven individuals participated in this study. Of those 57, the number of male (N= 29) and female (N=28) participants were almost exactly the same. The most commonly reported age band of participants was 18-30 years, and this is likely due to the area in which participants were recruited from having a majority student population. Participants were recruited for the study using convenience sampling both online via email, and in person around the National College of Ireland Campus. The majority of these participants were either staff or students within the college with the exception of a few others from various different areas that were interested in taking part after being contacted via multimedia channels. The inclusion criteria was as follows; any person between the ages of 18-60 years of age. The exclusion criteria were as follows; any cognitive impairments or severe learning difficulties, and any pre-existing conditions that affected ones balance such as dyspraxia, vertigo, chronic migraines etc. None of the participants were required to have any prior

athletic experience. All participants completed all aspects of the study and no data had to be excluded.

Design

The current study design is fully quantitative in nature. The data was collected cross-sectionally. It is a quasi-experimental, between groups design. The Dependant variable was Performance (Balance Time) and was measured as a scale variable. The Independent variables were Age, Gender, Activity Levels and Type of Self Talk, all measured as categorical variables.

Apparatus and Measures

All participants completed the study in a room in NCI that was small but had adequate space to complete the balance task safely. Refreshments were provided to participants. A table and chair were provided for participants to use when reading the information and consent forms and filling out the questionnaires. A pen and paper copies of all forms and questionnaires were used for all participants. A Crivit exercise and balance board was used. A Dell desktop computer was used to record participants balance time and to input their data into the statistics software. IBM SPSS was the programme used for statistical analyses.

Type of self-talk questionnaire. The type of self-talk questionnaire was developed by Araki et. al. (2006) for use in their balance performance study. It was designed based on previous research by Girodo and Wood, (1979), Goodhart, (1986), Mahoney and Avener, (1977), Van Raalte et al., (1994) and Weinberg, (1985). It consists of seven different categories of self-talk; Calming/Relaxing, Performance worry, Instructional, Self-doubts in ability, Motivational, Frustration and Focus. Examples of each type of self-talk were provided. For the purpose of this study, these categories were further grouped into two main categories, Negative self-talk (Performance worry, Frustration, Self-doubts in ability) and Positive self-

talk (Calming/Relaxing, Instructional, Motivational, Focus). Any participant who indicated exhibiting self-talk from both categories were placed in a Mixed self-talk category.

Demographic Questionnaire. The demographic questionnaire was created for use in the current study. It consists of 5 questions to be filled out by the participant. They were asked for their participant ID number given to them at the commencement of the study. They were asked to circle their gender (Male / Female), age range (18-30 / 31-44 / 45-50), Activity level per week (<1 Hours / 2-5 Hours / 5+ Hours), and finally there was space to fill out the time (Ranging from 0-30 seconds) spent on the balance board.

Procedure

A pilot study was conducted to test the methods, structure and questionnaires before the main study. The pilot study consisted of eight participants. The pilot study was conducted two weeks before data collection started for the main study. The pilot study followed the exact same steps and procedure as the main study.

Participants were shown into the room, one at a time with no more than two people, the researcher and the participant, in the room at any one time. They were asked to take a seat at a table, given their Participant ID number, handed the information sheet, and asked to read through it thoroughly. Once finished, they were shown the consent form, asked to ensure they understood and agreed with it, asked to sign their participant ID, not their name so as to de-identify the data, in the space provided. All participants were reminded that they could withdraw their participation at any time before they left, but once their data was input into the statistics software it could not be identified and therefore could not be removed. They were then asked to take the time to fill out the demographic information sheet, writing their ID number, and circling the appropriate age, gender and activity level categories.

Once they had finished, it was explained to them what they would have to do. They were first told to take thirty seconds to take a test try on the balance board, and a timer was

set by the researcher on the desktop computer. They were told they could use their hands on the wall in order to step onto the board, but they must not use their hands on the wall for support once they were comfortably on the board. Once they had taken the test try ,they stood back down off the balance board. Then they were told they would be timed again for thirty seconds, to stay on for as long as they could hold their balance or until thirty seconds had passed. They were also told to be aware of their self-talk, what they say to themselves in their head, their inner monologue. They were reminded not to use their hands once on the board, and the time was set again for thirty seconds.

Once the participant had completed the task and stepped off the board, their balance time was recorded on the appropriate slot on their demographic sheet by the researcher so as to avoid any dishonest scores being recorded. They were then asked to sit back at the table and were given the Type of self-talk questionnaire. The questionnaire was briefly explained, and they were asked to circle any of the types of self-talk that they had engaged in during the task. Once they had completed that, they were directed to the debriefing sheet and asked to read through it. They were given the opportunity to ask any questions they had and thanked for their time and participation. Their data was then entered into a password encrypted file on SPSS on the desktop, and the paper copy was destroyed.

Results

Descriptive statistics

No participants data needed to be excluded, and no values were missing from any of the variables. There was no variance in balance times among the participants, as they all scored the same, therefore this precluded the need to conduct preliminary analyses to assess the normality of the data. Frequency analyses were conducted on Age, Gender, Physical Activity, Negative/Mixed or Positive Self-talk, and all seven type of self-talk variables. The results can be seen in Table 1.

Table 1 - Frequencies Table (N = 57)

Variable	Frequency	Percentage
Age		
18-30 Years	40	70.2
31-44 Years	10	17.5
44-60 Years	7	12.3
Gender		
Male	29	50.9
Female	28	49.1
Physical Activity		
1 Hour or Less	12	21.1
2 – 5 Hours	21	36.8
5 or More Hours	23	40.4
Positive/Neg-Mixed ST		
Positive	43	75.4
Negative/Mixed	14	24.6
Variable	Frequency	Percentage

Calming/Relaxed ST		
Yes	32	56.1
No	25	43.9
Performance Worry ST		
Yes	9	15.8
No	48	84.2
Instructional ST		
Yes	25	43.9
No	32	56.1
Self-Doubt ST		
Yes	5	8.8
No	52	91.2
Motivational ST		
Yes	30	52.6
No	27	47.4
Frustration ST		
Yes	3	5.3
No	54	94.7
Focus ST		
Yes	45	78.9
No	12	21.1

Inferential statistics

Due to the nature of the data, the planned Independent Samples T-test's and One-way ANOVA's could not be conducted or computed by SPSS. This was due to the fact that the data was non-normally distributed, and also because there was absolutely no variation between balance times among participants whatsoever. In light of this, a descriptives table has been included to highlight the frequencies and percentages of each of the variables (See Table 1).

A Spearman's Rank Order Correlation was conducted to investigate any correlations between the variables of Age, Gender, Physical Activity Levels and the seven types of self-talk defined in the Type of Self-talk Questionnaire; Calming/Relaxing Self-Talk, Performance Worry Self-talk, Instructional Self-talk, Self-doubt in Ability Self-talk, Motivational Self-talk, Frustration Self-talk and Focus Self-talk. The data was non-normally distributed, which is why a non-parametric alternative to the Pearson Product Moment Correlation Co-efficient was used. There were no significant (P = .05) correlations. The correlation matrix can be seen below in (Table 2).

Table 2 – Spearman's rho correlation matrix

Variables	Age	Gend..	Phys..	Calm..	Perf..	Inst..	Self..	Moti..	Frus..	Focu..
Age	1.000	.033	.007	.032	.025	-.144	-.199	-.056	-.151	-.130
Gender	.033	1.000	-.199	.161	-.137	.192	.192	.229	-.074	-.009
Physical Activity	.007	-.199	1.000	-.163	.080	.035	-.006	-.162	.139	.042
Calming Self-talk	.032	.161	-.163	1.000	.189	.069	.024	.153	.050	.237

Performance Worry	.025	-.137	.080	.189	1.000	.102	.206	-.071	.113	.106
Instructional Self-talk	-.144	.192	.035	.069	.102	1.000	.101	-.153	-.050	-.151
Self-doubt Self-talk	-.199	.192	-.006	.024	.206	.101	1.000	.170	.205	.080
Motivation Self-talk	-.056	.229	-.162	.153	-.071	-.153	.170	1.000	.066	-.059
Frustration Self-talk	-.151	-.074	.139	.050	.113	-.050	.205	.066	1.000	.122
Focus Self-talk	-.130	-.009	.042	.237	.106	-.151	.008	-.059	.122	1.000

Note. Statistical significance: *$p < .05$; **$p < .01$; ***$p < .001$

Discussion

Addressing results in relation to hypotheses and existing literature

The hypotheses for the current study were as follows; “People who engage in Positive self-talk will perform better than those who engage in negative/mixed self-talk ”, “There will be a correlation between Type of self-talk and gender age and activity levels” and “Some differences in performance score will be observed between different gender, age and activity categories”. These were based on empirical evidence from a wide range of previous research and studies indicating results that align with those hypotheses, for example the Araki et al (2006) study, and many studies by researchers that are well published in the field of self-talk and performance, such as Hall (2001(a)(b); 2005(a)(b)(c); 2006; 2011), Hardy (2001(a)(b); 2005(a)(b) and Hatzigeorgiadis (2004; 2008; 2011). Many of the finding of those studies indicated that self-talk in any capacity usually had significant effects on performance (Hamilton, Scott & MacDougall, 2007), or that participants scores on balance tasks would differ depending on variables such as age (Shariati & Fazel, 2013).

The results of this study, however, were unexpected and interesting. There was no difference in any balance times whatsoever across the 57 participants , meaning there was absolutely no variation of scores among the different variables of gender, age, self-talk type and activity level. This does not reflect the findings of any of the previously mentioned studies, nor does it reflect the findings of the Araki et al (2006) study that was the basis for this study, therefore challenging the results of that original study. The results of this study also do not support any of the hypotheses presented, and so therefore it can be assumed that the null hypothesis in each case is true. An effect size could not even be calculated due to the nature of the results, and therefore the effect cannot be discussed or assumed. Considering there was no differences at all in balance performance scores regardless of self-talk type,

gender, age or activity level, this could imply that self-talk is ineffective for use in enhancing or aiding performance, although this largely contradicts previous research and could be due to methodological errors or small sample size. Results of this nature are not widely reflected in previous studies within the area of research surrounding self-talk and performance, as he majority of studies had even some slight variation of results, regardless of how small the effect or significance may be. One of the rare studies that didn't find self-talk effective in enhancing performance was by Palmer (1992), who found self-talk ineffective strategy for performance enhancement against two control measures. That makes the results of the current study quite unique, as they oppose the results of the majority of studies in existing literature. These results could be due to methodological error, and all possible explanations and limitations of this study will be considered and discussed.

Limitations/explanations of results

The first possible explanation for the lack of variation in the data could be that the study was underpowered. After having approached close to 250 individuals both in person and via online methods, only 57 participated in the study. The Araki et al (2006) study had 125 participants. This means the study fell short of the desired minimum number of 80 participants that would have been necessary to find an effect. This could not be avoided due to time constraints and lack of funding, without access to a more suitable sampling method than convenience sampling.

The next possible explanation for the results could be that the measures used to test for the different variables may not have had very good reliability or validity. The type of Self-talk Questionnaire was taken from the Araki et al study and was used without making any revisions or changes. This is a self-report measure, and these are not always reliable or valid measures. Having been used before in the Araki study, it can be given some reliability,

but a score for validity could not be obtained, meaning the questionnaire may not be accurately measuring self-talk as a variable. The demographic questionnaire was very simple, and was created for the purpose of this study, and simply gauges age, gender and activity level, also using self-report measures.

Another problem that arose with this studies methodology was that the piece of equipment used in the Araki et al (2006) study, a stabilometer, could not be obtained. This was due to financial and time constraints. Therefore, the alternative was a simpler exercise balance board. This did not have the ability to record as much data as the stabilometer, such as degree of tilt etc. in relation to participants balance. The only way to measure balance with this alternative balance board was to measure how long a participant could stay on for, and whether or not they could keep their balance and stay standing on the board without falling or stepping down. This introduces many methodological flaws to this study and limits the amount of data that could be recorded in terms of participant balance. It also means that this study was not a full replication of the measures used in the Araki et al (2006) study, but rather a partial replication.

Another limitation of this study was that due to the nature of the data collected, the appropriate statistical analyses could not be computed, nor could non-parametric alternatives be used simply due to the fact that there was no differences in scores to analyse. Therefore, not much data analysis could be done, and there were no significant figures to discuss in relation to the data. This makes it difficult to compare to other studies as there are no definitive results to compare previous studies results against. The results of this study also cannot be generalised to any populations in real-life scenarios.

Finally, the participants may have all performed well on the balance task because they were allowed a 30 second test try on the balance board (as was the case in the Araki et al

study). This could have led to what's known as the "Practise effect", when the performance on a task or test is influenced by prior experience/practise of the same task. Participants may not have had good balance the first time they stood on the board but may have become more comfortable with the task the second time having already done it once.

Although all precautions were taken to minimise the risk to participants, some minor ethical issues remained with this study that could not be avoided. Even though the task was completed in an open space with carpeted flooring and the experimenter close by to assist participants, some participants stumbled or fell while initially trying to step onto the balance board. Although nobody was harmed or injured, these risks must still be addressed.

Implications / Recommendations for further research

Considering in this study, the null hypothesis in all three cases was found to be true, this suggests that self-talk is not a useful or effective means for enhancing performance. If this is the case, sports psychologists and coaches should possibly consider alternative approaches for enhancing performance. One popular alternative often seen in literature is mindfulness. This psychological technique is also used to improve performance in athletes, for example in one study by Bernier, Thienot, Codron and Fournier in 2009 found mindfulness behaviours and practices to be a useful and effective approach to enhancing performance in populations of professional swimmers and golfers, and found a mindfulness based intervention programme contributed to better performance in competitions. Mindfulness is not only useful in sports performance, but also has beneficial practical applications in other everyday situations. The results of a study conducted on the effectiveness on mindfulness on job performance in the workplace supported the theory that there is a positive relationship between mindfulness and job performance (Dane & Brummel, 2014).

Another thing that coaches and policymakers within sports and athleticism may want to consider in relation to self-talk is whether or not to encourage positive, affirming, or motivational self-talk as a useful strategy for performance enhancement before and during performances. Many athletes are encouraged to engage in these "pep-talks" before they compete to boost their efficacy, morale and performance (Gonzalez, Metzler & Newton, 2011), but if self-talk is not effective in enhancing performance, or if there is little difference in the effects of negative and positive self-talk on performance as suggested by the Hardy et al (2001) study mentioned in the literature review, then encouraging these strategies may not be useful to athletes.

For further research on this topic, it would be useful to consider aiming for a larger sample size if possible, and it would be beneficial to use better sampling methods, such as random sampling. If this study were to be replicated, it would be helpful to invest in the appropriate equipment where circumstances allow. The methodology could also be changed in a way that makes the balance task itself more difficult, or the criteria for "good balance score" be made stricter, for example placing a longer time limit, or following a points based system points are deducted from a participants overall balance score for falls, wobbles or shorter time spent on the board. The first test trial on the board could also be excluded in order to combat the possible practise effect that may have occurred in this study. In terms of the variables, using a non-self-report measure for interpreting the type of self-talk participants engaged in may prove better than using a self-report measure. Another minor change could be to measure the variables of age and activity level as continuous rather than categorical.

Conclusion

The current study provided research on self-talk on performance in a novel population, while also looking at the effects of age, gender and activity levels, something that

has not been widely seen in existing literature. The hypotheses for the current study were refuted. The existing literature frequently proposed that there was some relationship between self-talk and performance, with most suggesting this relationship was a positive correlation. Some studies suggested this was just between positive self-talk and performance (Gould, Hedge, Peterson and Giannini, 1989), while others argued that both negative and positive self-talk had beneficial effects on performance (Hamilton, Scott & MacDougall, 2007). This study, however, found no differences in balance scores between any participants, regardless of self-talk type, gender, age or activity level. This could have been due to many methodological flaws, limitations due to time and financial constraints, or lack of participants. Recommendations for future research were made in lieu of these limitations, and implications for both psychological and everyday practise were made in light of the results of this study, including alternatives to self-talk in performance, such as mindfulness techniques.

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Appendices

Participant Demographic Information Sheet

Participant identification number: _____

Age (Please circle appropriate category): 18-30 / 31-44 / 45-60

Gender (Please circle appropriate category): Male / Female

Hours spent engaging in physical activity (walking, jogging, workouts) per week:

>1 hour / 2-5 hours / 5+ hours

Balance Time (To be filled in by researcher):_____

Appendix B

Items in the Type of Self-Talk Questionnaire

You were asked to generate self-talk about the task prior to and during performance. How would you classify the types of self-talk you used? (Please check all that apply)

Type of self-talk	Examples
Calming/Relaxing	"Take a deep breath." "Don't worry, take your time and slow down."
Performance Worry	"I hope I don't do too badly." "This is too hard."
Instructional	"Bend your knees." "Stop, stop! Balance."
Self Doubts in Ability	"I can't do this." "I'm no good at balancing."
Motivational	"Yes! Come on, let's go!" "I know I can do it."
Frustration	"This makes me mad." "Why do I bother?"
Focus	"Don't think about anything, just concentrate." "Focus on your feet and find the best position."

Participant Number:_____

Informed Consent Form

Please carefully read the below statements. Ensure that you understand the information, and that you agree fully with the statements. Please be aware that by signing you participant number on this form you acknowledge that you have read and agree to the terms outlined, and that you give permission for the data generated by you to be used for research purposes in this study.

1. I have made the decision to partake in this study of my own free will, without influence or coercion.
2. I do not have any cognitive impairments, or balance affecting disorders such as dyspraxia, vertigo, etc.
3. I understand that I will not receive any form of reward or payment for my participation.
4. I am aware that I have the right to cease participation and withdraw from the study at any time, without penalty or consequences.
5. I consent to the use of any information provided / data generated by me, for research purposes in the current study.
6. I understand that only those involved in the current study will have access to my information, and that it will not be made available to the public or any third parties.
7. I understand my role in the current study, and the task I have to undertake has been made clear.
8. I understand that the researcher takes full responsibility for the handling, use and storage of my data and information.
9. I consent to data generated by me in this study being used for this study and presentations relating to this study.

Participant Number: _____

Information about the current study:

About the researcher and the study:

INVESTIGATING HOW SELF-TALK AFFECTS PERFORMANCE

I am Leah Sheridan, a final year NCI psychology undergrad student interested in studying self-talk and performance. This study aims to investigate the relationship between self-talk and performance by using a balance task and a measure of type of self-talk. Self-talk is ones inner dialogue, what we say to ourselves in our heads at any given moment. I aim to see if there is a difference in performance and self-talk between people of different ages, activity levels and genders.

Your role as a participant / What will happen during the experiment:

Taking part in the current study will involve giving informed consent and meeting the outlined inclusion and exclusion criteria on the next page. You will be asked to fill out a very short demographic questionnaire, followed by a timed 30 second balance task, in which you will need to stand on a balance board for as long as you can or until you reach 30 seconds, and take note of your thoughts and self-talk. Then you will be asked to fill out the type of self-talk questionnaire to identify the type of self-talk you engaged in. Finally, you will be debriefed and provided with resources and helplines in the case of any negative thoughts or emotions that arise from participation.

Information about your participation:

Your participation is voluntary, and you will take part of your own free will, and with no incentive/reward for taking part. You are in no way obligated to take part in this study, and you have the right to withdraw at any time throughout the study. There are very minor risks involved in taking part, no more so than you would encounter in your normal daily life. If you lose balance, you may fall or trip, but the researcher will assist you should you lose balance and you will be on a level carpeted surface. You may experience minor feelings of shame, doubt, anxiety or inadequacy, but helplines and resources will be provided following the task.

Confidentiality, data storage and protection:

If you participate in this study, your data will be stored in a de-identified manner, meaning no personal or potentially identifiable information will be recorded. All data collected for this study will be stored in an encrypted and encoded manner and deleted/destroyed following study completion. All information collected will be used only for the purpose of this study/ my thesis, and no information will be used for any other reason outside this thesis or presentations/conferences directly related to this thesis.

Further Information:

Thank you for your interest or participation in this study, and if you have any further questions or need any clarification or further information, please don't hesitate to contact myself or my supervisor using the following contact information;

Researcher – Leah Sheridan, NCISelfTalkThesis19@Gmail.com

Supervisor – April Hargreaves, April.Hargreaves@Ncirl.ie

Debriefing Sheet

You have just completed the Balance task, Self-talk questionnaire, and Demographic Questionnaire. The aim of this study is to collect data from all participants and investigate the relationship between the type of self-talk you engaged in (Measured by the questionnaire you filled out) and your score on the balance task. We will also look at the collective results of Age, Gender and Activity level in relation to your performance on the balance task, to see if there are any differences on scores of people from different ages, genders and activity levels. Thank you for participating in this study.

If anything has negatively affected you throughout the duration of this study, or you feel uneasy, anxious or depressed as a result of this study, here are some helpful resources for you to engage with;

Samaritans Ireland – 01 671 0071

NiteLine – 1800 793 793

Aware Ireland – 1800 80 48 48