Gender Differences in Elite Archers Self-Response: Self-Inadequacy, Self-Hate, Self-Reassurance

Mina Burns
Canyon Crest Academy
5951 Village Center Loop
San Diego, CA 92130
USA

Abstract

Elite athletes are presumed to be resilient and self-confident; however, little research has been conducted on how athletes respond to their performance and whether there is a relationship between forms of self-response and performance. This study examines gender differences with regards to self-inadequacy, self-hate, and self-reassuring in elite archers. Self-criticism and the ability to self-reassure appear to be tied to both age and gender. For women, the ability to self-reassure increases and self-criticism diminishes with age and experience. The study also indicates a more complex relationship between the ability to self-reassure and self-hate, at least in men. Self-inadequacy, self-hate, and self-reassurance seemed to have little effect on performance ($r^2 = 0.0008$, $r^2 = 0.0035$, and $r^2 = 0.0151$ respectively). The study suggests that more research is needed to better understand the relationship between the forms of self-response.

Keywords: self-hate, self-inadequacy, self-reassurance, archery, Forms of Self-Criticizing/Attacking and Self-Reassuring Scale

1. Introduction and Literature Review

There has been much research on conceptions of self and performance, whether in the classroom or on the athletic field. There have also been many studies analyzing whether there are differences in conceptions of self between men and women. Very few studies, however, examine how specific response styles affect athletic performance and whether a particular self-response style affects the athletic performance of men and women differently. The present study (1) measures self-inadequacy, self-hate, and self-reassurance and their effect, if any, on performance by elite archers; and (2) examines whether different self-response styles affect the performance of male and female archers differently.

There are different ways that individuals respond to their own performance. Self-response has different forms and functions (Gilbert, Clarke, Hempel, Miles, & Irons, 2004). Some forms of self-response may be for self-improvement while others forms may be aimed at self-harm (Gilbert, Clarke, Hempel, Miles, & Irons, 2004). Forms of self-response are typically triggered when an individual experiences a disappointment or fails to meet expectations (Gilbert, Clarke, Hempel, Miles, & Irons, 2004). Individuals may respond negatively, through some form of self-criticism/self-attacking. Self-criticism/self-attacking is defined as "sensitivity to negative self-relevant information" (Kitayama, Markus, Matsumoto, & Norasakkunkit, 1997). Self-criticism/self-attacking has been closely tied to depression (Gilbert, Clarke, Hempel, Miles, & Irons, 2004).

Individuals may also respond positively to failure through self-reassurance, which means finding support or compassion for oneself (Gilbert, Clarke, Hempel, Miles, & Irons, 2004). The ability to self-reassure may help defend against the negative effects of self-criticism.

Previous research on gender differences in self-criticism shows that females have higher scores on self-criticism (Vanea & Ghizdareanu, 2012) (Baião, Gilbert, McEwan, & Carvalho, 2015). Research also shows that males have higher scores of self-reassurance and lower scores of self-inadequacy and self-hate than females (Baião, Gilbert, McEwan, & Carvalho, 2015).

There is scant research concerning the effect that forms of self-response (self-criticism/self-attacking and self-reassurance) have upon athletic performance. However, research has been conducted on the effect of self-confidence on athletic performance. Self-confidence is defined as "one's belief that he or she can successfully execute a desired behavior" (Feltz, 1988). Self-criticism/self-attacking can thus be viewed as antithetical or discordant with self-confidence in the sense that a self-confident individual believes that he or she can accomplish a given task whereas a self-critical/self-attacking individual is disappointed in oneself after failure, perceived or otherwise. As previously noted, self-criticism/self-attacking is "typically activated when people feel they have failed in important tasks or when things go wrong" (Gilbert, Clarke, Hempel, Miles, & Irons, 2004). Self-criticism/self-attacking can take two general forms: self-inadequacy and/or self-hate. (Gilbert, Clarke, Hempel, Miles, & Irons, 2004). Self-inadequacy can be defined as focusing on failures and inadequacies while self-hate can be described as more aggressive and can be characterized as repulsion towards oneself.

The research on self-confidence provides some insight into the effect of negative forms of self-response on athletic performance. Self-confidence has been claimed to be the most important mental factor for archery (Kim, Kim, & So, 2015). A very popular, non-academic book used extensively by USA Archery coaches, *With Winning in Mind*, stresses the importance of cultivating a positive "Self-Image" which the author defines as "the total of your habits and attitudes" (Bassham, 2011). Self-confidence also has been found to protect an athlete from thoughts that could have a negative effect on performance (Hanton, Mellaliu, & Hall, 2004), as well as extending the amount of cognitive anxiety an athlete can tolerate until experiencing a decrease in performance (Hardy, 1990). Females have been shown to have higher competitive anxiety (Patel, Hatim, & Tery, 2010) (Grossbard, Smith, Smoll, & Cumming, 2009). If poor performance is tied to greater competitive anxiety, then this research might lead us to believe that females' higher levels of competitive anxiety would result in lower performance for female than male athletes. However, other literature indicates that an increase in self-confidence may lead to feelings of overconfidence, and to a decrease in effort and thus a decrease in performance (Bandura & Locke, 2003) (Eysenk & Calvo, 1992) (Gould, Petlichkoff, Simons, & Vevera, 1987).

Research indicates that when individuals received negative criticism from others, they were less likely to successfully handle conflicts in the future (Baron, 1988). The present study examines the relationship between the ability to self-reassure, forms of self-criticism/attacking and any effect upon athletic performance. This study also examines gender differences with regards to forms of self-response and performance.

2. Purpose

This study (1) measured different forms of self-response in elite archers; (2) assessed whether there was a correlation between athletic performance (as measured by the difference between expected arrow average and actual approximate arrow average) and forms of self-response; and (3) assessed whether there were any gender-related disparities.

3. Methodology

Archery was selected to be studied because archers do not rely on physical strength as much as other athletes. Elite archers were selected because inexperienced archers' performances and practice schedules would likely be more erratic, while elite archers would have more consistent training and performance. The participants were members of the U.S.A. Archery Junior Dream Team (JDT) and Resident Athletes (RAs). The RAs are senior archers (most are ages 21 and up) who train full time at the Olympic Training Center and hope to make the U.S. Olympic Team. JDT is comprised of youth archers who are selected to periodically train at the Olympic Training Center four times a year. Youth archers are either cadets (ages up to 17) or juniors (ages up to 20). The JDT consists of 36 youth (cadet and junior) archers and 12 alternates nationwide ranging from about 13-18 years old. JDT archers are selected through a competitive process. The purpose of JDT is to train archers to qualify to become RAs.

The method for data collection was in the form of a survey created in Google Forms. The survey contained a list of questions regarding archers' scores, habits and self-perceptions. Some of these questions assessed levels of self-criticism.

Some questions in the survey pertained to the scores and behaviors of the archers at 2016 Outdoor Nationals. Outdoor Nationals is an annual two-day, national archery competition where archers shoot a total of 144 arrows. The 2016 Outdoor Nationals took place from July 13-17, 2016. The coach for the RAs and the coach for the JDT sent out the Google Forms survey via email approximately one week after the competition.

The coach for the RAs sent the survey out to the 14 RAs on July 19, 2016. The coach for JDT sent the survey out to the 42 JDT members and alternates on July 21, 2016. 8 RAs and 11 JDT members participated for a total of 19 responses.

3.1. Survey

In order to preserve the anonymity of the athletes, they were not asked to identify themselves and their online survey responses were not otherwise identifiable. Because archery scores can be very individualized and could be used to identify the archer, the archers were not asked their precise scores. Instead the archers selected a score band. Archery scores are discussed further below.

The survey consisted of two parts. Part I consisted of questions regarding each archer's scores and habits, including the archer's gender and division. The divisions were Cadets (for ages up to 17), Juniors (for ages up to 20) and Senior (most were ages 21 and up). Another question asked the archer's goal (or expected) score. Some of the questions in Part I related to the archers' scores after each session at Outdoor Nationals 2016. The tournament was split into 4 sessions and during each session, each archer was supposed to shoot 36 arrows. Men and women competed at different times. Unfortunately, each male archer was only able to shoot 12 arrows during their second session due to lightning and extreme weather conditions. The survey asked for each archer's score after each of the four sessions; however, because of the session where the male archers were only able to shoot 12 instead of 36 arrows, the survey asked the male archers for their scores for 12 arrows instead of for 36 arrows for that one session. Several additional and irrelevant questions were included to obscure the objective of the study.

As previously mentioned, in order to keep the results confidential and preserve anonymity, the survey presented bands of scores. The archers were asked to identify the band of their scores for each session, instead of identifying their exact scores for each session. For example, an archer who shot a score of 312 for one session would have marked the band of 310-314 for that session. The scores were out of a total of 360 possible points except for the scores from the second session for the male archers which were calculated out of a total of 120 possible points.

3.2. Arrow Average

The author calculated approximate actual arrow averages for each archer based upon each archer's reported band. (The exact actual arrow average could not be calculated because the archers reported their band instead of their actual score). Arrow averages range from zero to 10. A zero means that the archer didn't hit the target at any time during the tournament, and a 10 means that the archer hit the center of the target (the 10-ring) every single time during the tournament. The author calculated the expected arrow average of each archer by dividing the archer's goal score by the total number of arrows he or she hoped to shoot (144). The author calculated the approximate actual arrow average for each archer by first identifying the midpoint of each archer's score band for each session and then adding all four sessions and dividing the total number for the total number of arrows shot. For female archers, the total number of arrows shot was 144 (36 X 4) and for male archers, the total number of arrows shot was 120 (36 X 3 +12). For example, the following shows how the actual arrow average of a female archer who shot 317, 310, 308 and 312 would be calculated:

1. The female archer would select the intervals 315-319, 310-314, 305-309, and 310-314 in the survey.
2. The midpoint of each interval would be identified respectively as 317, 312, 307, and 312.
3. The midpoints would all be added together to compute the total score: 317+312+307+312 = 1248
4. The total score (1248) would be divided by the total number of arrows shot (144) to get an approximate actual arrow average of 8.667.

The arrow average of a male archer who shot 305, 93, 323, and 314 would be calculated as follows:

1. The male archer would select the intervals 305-309, 91-96, 320-324, and 310-314.
2. The midpoint of each interval would be identified respectively as 307, 93.5, 322, and 312.
3. The midpoints would be added together to get a total score of 1034.5 307+93.5+322+312=1034.5.
4. The total score (1034.5) would be divided by the total number of arrows shot (120) to get an approximate actual arrow average of 8.6208.

Part II contained questions about the archers' forms of self-response. This study uses the Forms of Self-Criticizing/Attacking and Self-Reassuring Scale (FSCRS) developed by Gilbert, Clarke, Hempel, Miles, and Irons. (Gilbert, Clarke, Hempel, Miles, & Irons, 2004) The FSCRS was selected because it is generally accepted as reliable and has been used in many studies (Baião, Gilbert, McEwan, & Carvalho, 2015). The FSCRS contains 24 items divided into three components: the inadequate self, the reassured self, and the hated self.

Self-reassurance can be defined as focusing on positive aspects and ways to improve, self-inadequacy can be defined as focusing on failures and shortcomings, and self-hate can be defined as aggressive disgust (Gilbert, Clarke, Hempel, Miles, & Irons, 2004). The FSCRS measures "forms of self-attacking when things go wrong for people" to help determine the different functions or purposes of self-criticism (Gilbert, Clarke, Hempel, Miles, & Irons, 2004). It also measures how self-reassuring might be related to self-criticism/attacking (Gilbert, Clarke, Hempel, Miles, & Irons, 2004). This study adopted 20 of 24 items in the FSCRS because 4 of the components were deemed by the author to be inappropriate or confusing given the specific circumstances and nature of the study.[1]

The survey required the archers to respond to an item, e.g. I still like being me, by indicating how much they identified with it based upon a scale of 0 to 4. If the individual marked 0, that individual did not identify with the statement at all. If the individual marked 4, that individual strongly identified with the statement. The inadequate self-score was out of a total of 32, the reassuring self-score was out of a total of 24, and the hated self-score was out of 16.

4. Results

A total of 19 archers responded to the questionnaire, 10 of whom were male (6 seniors, 1 junior and 3 cadets) and 9 of whom were female (2 seniors, 4 juniors, and 3 cadets). See 8.1 for male participants and 8.2 for female participants. In both gender groups, archers expected to score higher than they did, but male archers' performances on average were closer to their actual score. The average difference between male archers' expected arrow averages and approximate actual arrow averages was 0.1599. The average difference between female archers' expected arrow averaged and approximate actual arrow averages was 0.2438. Most of the archers failed to meet their goals[2] except for 6 of the 19 archers who exceeded their goals. The approximate actual arrow averages for females and males are not comparable because there wasn't an equal number of juniors and seniors in the male and female groups and the ability of the archer likely varies with the division which would affect the arrow average. However, what is comparable between female and male archers is the difference between expected arrow average and approximate actual arrow average.

Females averaged a self-inadequacy score of 16.1 which was 3.2 points higher than the average self-inadequacy score of males, which was 12.9 (8.3). Males averaged a self-hate score of 3.2 which was 1 point higher than the average self-hate score of females which was 2.2(8.4). Males also averaged a higher self-reassuring score than females. Males averaged a score of 17.5 while females averaged a score of 15.6 (8.5).

At first glance, women seemed more insecure and prone to self-criticism than men. Women had an 31.00% higher mean self-inadequacy score and a 10.86% lower mean self-reassurance score than men (8.3 and 8.5). On the other hand, men had a 45.45% higher mean self-hate score (Figure 2). However, a closer look at the data shows a significant difference between JDT females and RA females. Female JDT members (the younger juniors and cadets) had an 89.47% higher mean self-inadequacy score than the female RAs. Female JDT members had a mean score of 18 while RA females had a mean self-inadequacy score of 9.5 (Figure 8.3). JDT females also had a 442.86% higher mean self-hate score than RA females (Figure 2). JDT females had a mean self-hate score of 2.71 while the RA females had a mean self-hate score of 0.5 (Figure 2). In addition to these differences, JDT females also had a 14.29% lower mean self-reassuring score than RA females. RA females had a mean self-reassuring score of 17.5 while the JDT females had a mean self-reassuring score of 15 (Figure 3).

Interestingly, RA females scored lower than RA males in self-inadequacy and self-hate. The RA males had a 65.26% higher mean self-inadequacy score and a 116.67% higher mean self-hate score. The RA males had a mean self-inadequacy score of 12.67 and a mean self-hate score of 4.33(8.3 and 8.4). The RA males and females received similar scores for self-reassurance. The RA females averaged a score of 17.5, while RA males scored 1.90% higher with a score of 17.83 (8.5).

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[1] The item, "I am able to care and look after myself," was omitted because the RAs live at the Olympic Training Center and have many of their needs taken care of by others. The item, "There is a part of me that wants to get rid of the bits I don't like," was omitted because the meaning was unclear or confusing. The item, "I encourage myself for the future," was omitted because the meaning could have been interpreted as referring to the next Olympics given the recent trials. The item, "I do not like being me," was omitted because it was deemed duplicative or confusing with the item, "I still like being me."

[2] The failure to meet their goals may have been attributable to the extreme weather conditions.

At the JDT level, there was also a gender gap. JDT females had a 35.84% higher mean self-inadequacy score, 80.67% higher mean self-hate score, and 11.76% lower mean self-reassurance score than JDT males. JDT males had a mean self-inadequacy score of 13.25, a mean self-hate score of 1.5, and a mean self-reassurance score of 17 (8.3, 8,4, and 8.5).

RA males had a 14.49% higher mean self-inadequacy score and a 4.88% higher mean self-reassurance score than JDT males. RA males had a 211.33% higher mean self-hate score than JDT males (8.3, 8.4, 8.5).

5. Analysis

A graph displaying the relationship between self-inadequacy score and difference between expected arrow average and approximate actual arrow average shows that the $r^2 = 0.0008$ which shows close to no correlation (8.6). Thus, it can be concluded that there is no correlation between self-criticism in the form of self-inadequacy and achieving goals.

A graph displaying the relationship between self-hated score and difference between expected arrow average and approximate actual arrow average shows that $r^2 = 0.0035$ which is close to no correlation (8.7). Thus, it can be concluded that there is no correlation between self-criticism in the form of self-hate and achieving goals.

A graph displaying the relationship between self-reassuring score and difference between expected arrow average and approximate actual arrow average shows that $r^2 = 0.0151$ which is close to no correlation (8.8). Thus, it can be concluded that there is no correlation between self-reassurance and achieving goals.

There was no correlation between self-inadequacy score, self-hate score, or self-reassurance score and performance as measured by difference between expected arrow average and approximate actual arrow average.

6. Conclusion

This study indicates that self-reassurance and self-criticism/attacking is linked to age and gender. Female archers on average scored higher on self-inadequacy and self-hate while male archers scored higher on self-reassurance. However, the scores of all three components varied depending on the age of the archer, especially for female archers. Cadet females scored the highest on self-inadequacy out of all age and gender groups. Junior females scored the second highest on self-inadequacy. Senior females, however, scored the lowest out of all of the age and gender groups. The high self-inadequacy scores for cadet female archers could be reflective of growing societal pressures during the teen years (Daley, 1991). The pattern was also similar with respect to the self-hate component. Cadet females scored high on self-hate. Senior females, however, scored the lowest on self-hate out of all of the age and gender groups. This could be indicative that females learn more positive forms of self-response as they mature. It may also indicate that the RA program cultivates confidence. Female archers might enter the RA program feeling insecure, but as they train they may feel more confident. Another explanation, however, could be that only the most confident female archers are entering the RA program.

Age was a differentiator for male archers, too, but the older male archers had more negative forms of self-response. Cadet males had the second lowest self-hate scores. Senior males, on the other hand, had the highest self-hate scores, even higher than cadet females. Surprisingly, their comparatively high self-hate score did not correspond to a high self-inadequacy score. There were no significant differences among the inadequacy scores of the senior, junior and cadet male archers.

This study also found that the components of self-inadequacy, self-hate and self-reassurance are not strong predictors of whether archers will achieve their goals ($r^2 = 0.0008, r^2 = 0.0035$, and $r^2 = 0.0151$ respectively). There was no correlation between each self-response score and performance as measured by the difference between expected arrow average and actual arrow average. Additional study is required to determine what other factors more directly affect, and are affected by, performance.

Some potential sources of error pertain to the nature of the study which required the archers to self-evaluate. Some archers, for example, might have adjusted their responses to put themselves in a better light. Another potential source of error was the small sample size and the response rate (which was less than robust for the male junior and female senior archers). A complicating factor was that the national tournament occurred shortly after Olympic trials which may have affected the training schedule or mental attitude of the senior archers. Another potential source of error was that the arrow averages were, by design, inexact in order to preserve the archers' anonymity. However, the band of 5 points was narrow enough that any effect on results would be insignificant.

7. Discussion

The study has implications for educating and training girls in both athletic fields and other areas. The study suggests that even girls who are highly competent in a particular field (elite archers) have feelings of insecurity about their performance and ability in that particular field. The study also suggests that they may overcome these feelings of inadequacy with specialized training which focuses on their ability. The study also suggests that girls would benefit from programs teaching them ways to overcome negative thoughts and self-reassure, especially during the teen years.

The study also indicates that the forms of self-response studied here do not seem to affect performance or that there may be factors other than response styles which have a greater effect on performance. More research would be helpful to determine whether mental conditioning is as effective at improving performance in archers as commonly believed or whether greater benefit would be gained from other forms of training, such as increased physical conditioning.

The study may also have implications with respect to helping elite and professional athletes reintegrate back into society after their competitive careers are over. The study shows that senior male archers have comparatively high levels of self-hate. The higher level of self-hate of senior male archers compared to cadet male archers indicates that specialized and focused training may put more pressure on men than women. In other words, while participating in the RA program appears to improve the forms of self-response of female archers, it may negatively affect the forms of self-response with respect to male archers. The study suggests that men who participate in a program that focuses intently in one aspect of their life may benefit mentally and emotionally from a more balanced perspective. Additional study is required to determine whether focused programs, such as the RA program, should incorporate or encourage focus on different aspects of male participants' lives before they are released from training programs.

8.   Tables and Figures

8.1. Male Survey Responses

Participant	Division	Inadq	Hate	Reassure	Arrow Average (ArAvg)	Expected Arrow Average (ExArAvg)	Difference ExArAvg-ArAvg (Diff)
A	Senior	8	1	15	9.3541667	9.375	0.0208333
B	Senior	13	0	19	8.7625	8.8888889	0.1263889
C	Senior	15	11	17	9.0125	9.1666667	0.1541667
D	Senior	19	9	16	9.2208333	9.375	0.1541667
E	Senior	12	3	20	9.0208333	8.8541667	-0.1666666
F	Senior	9	2	20	8.5958333	8.8888889	0.2930556
G	Junior	15	2	17	8.7708333	9.0277778	0.2569445
H	Cadet	6	1	16	8.1791667	9.0277778	0.8486111
I	Cadet	19	1	15	8.9375	8.75	-0.1875
J	Cadet	13	2	20	8.9291667	9.0277778	0.0986111
Mean:		12.9	3.2	17.5	8.87833333	9.03819446	0.15986113

Table showing results of all responses for male archers.

8.2. Female Survey Responses

Participant	Division	Inadq	Hate	Reassure	Arrow Average (ArAvg)	Expected Arrow Average (ExArAvg)	Difference ExArAvg-ArAvg (Diff)
K	Senior	13	0	15	8.5625	8.0555556	-0.5069444
L	Senior	6	1	20	8.6319444	8.4722222	-0.1597222
M	Junior	23	6	15	7.9375	7.5	-0.4375
N	Junior	11	0	13	7.7638889	8.3333333	0.5694444
O	Junior	9	0	23	7.0486111	7.6388889	0.5902778
P	Junior	18	3	15	8.1458333	8.3333333	0.1875
Q	Cadet	21	4	12	8.4930556	8.3333333	-0.1597223
R	Cadet	25	5	12	7.625	8.8888889	1.2638889
S	Cadet	19	1	15	8.3194444	9.1666667	0.8472223
Mean:		16.1	2.22	15.56	8.058641967	8.302469133	0.243827167

Table showing results of all responses for female archers.

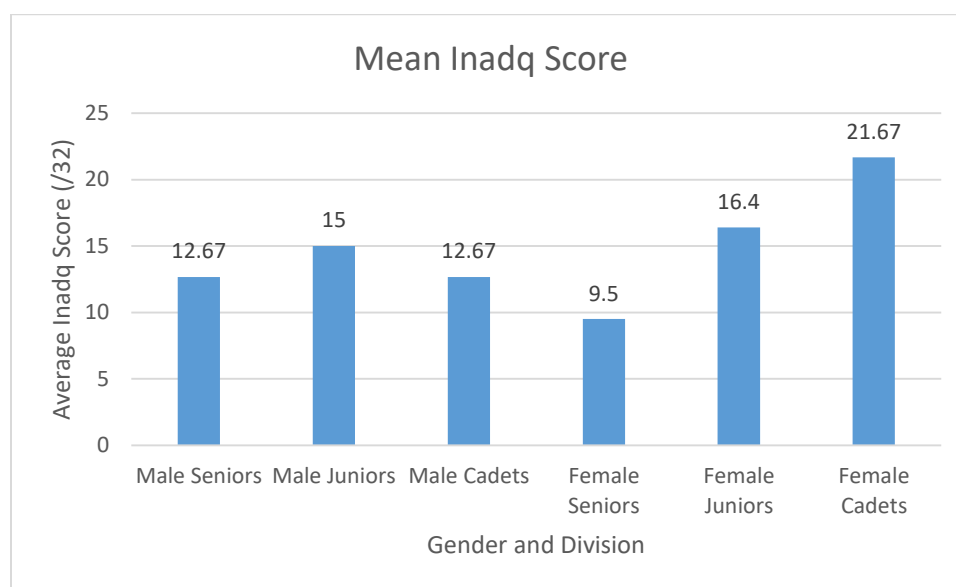**8.3. Mean Self-Inadequacy Score**

Figure showing average self-inadequacy score for different groups based on age and gender.
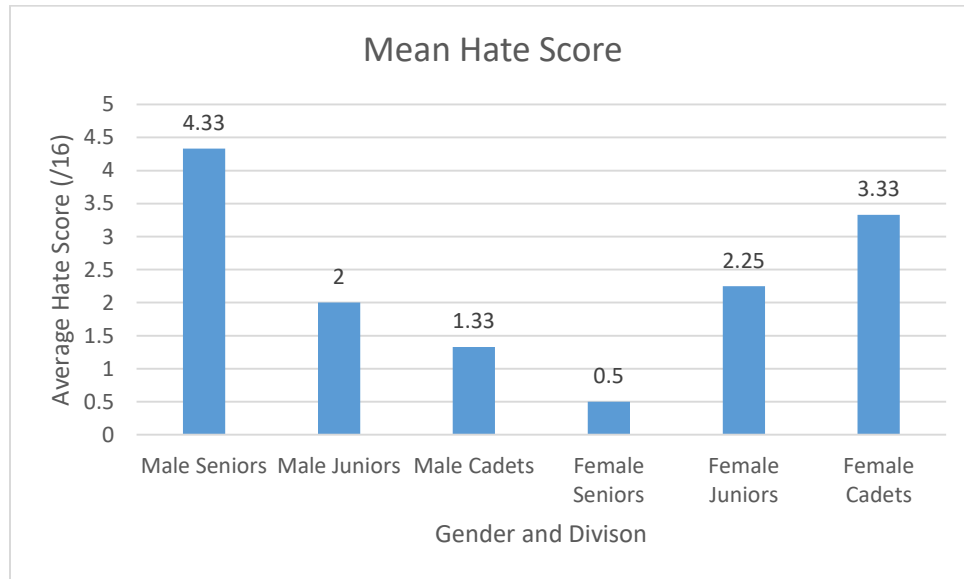
8.4. Mean Self-Hate Score

Figure showing average self-hate score for different groups based on age and gender.
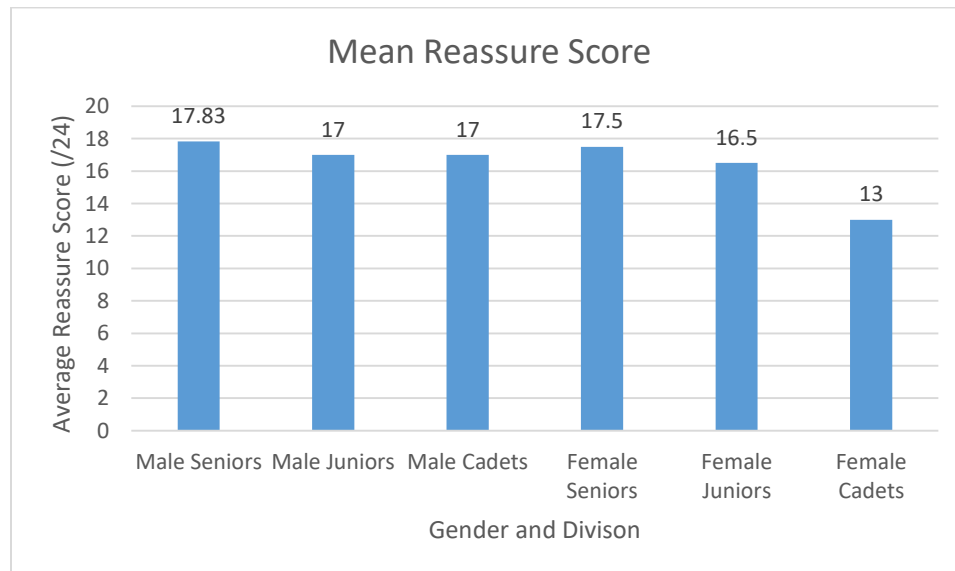
8.5. Mean Self-Reassuring Scores

Figure showing average self-reassurance score for different groups based on age and gender.
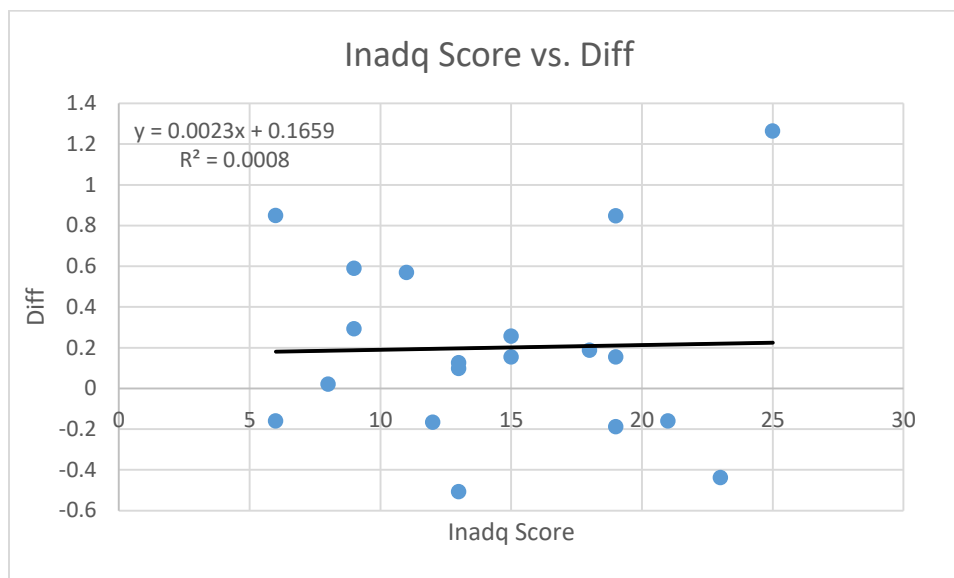
8.6. Self-Inadequacy Score vs. Difference between expected arrow average and actual arrow average

Figure showing correlation between self-inadequacy score and difference between expected arrow average and actual arrow average.
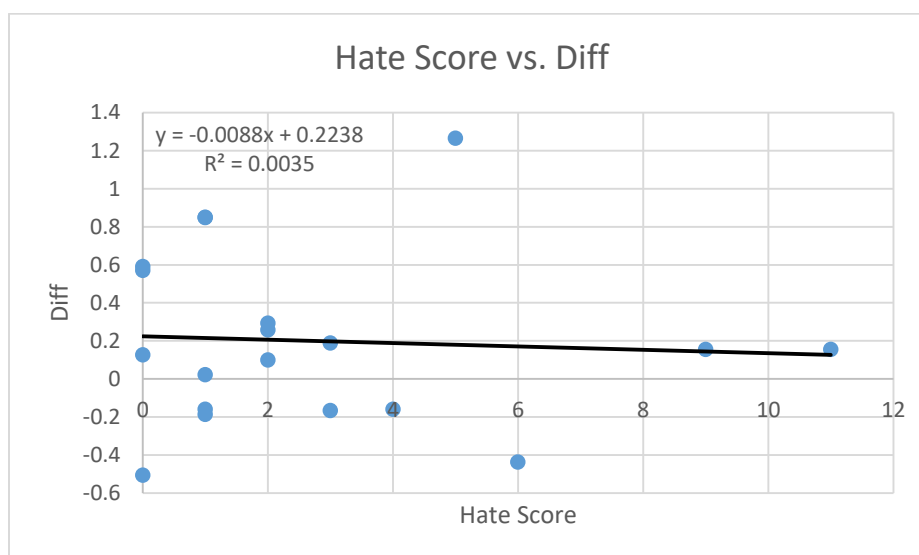
8.7. Self-hate score vs. Difference between expected arrow average and actual arrow average

Figure showing correlation between the self-hate score and difference between expected arrow average and actual arrow average.

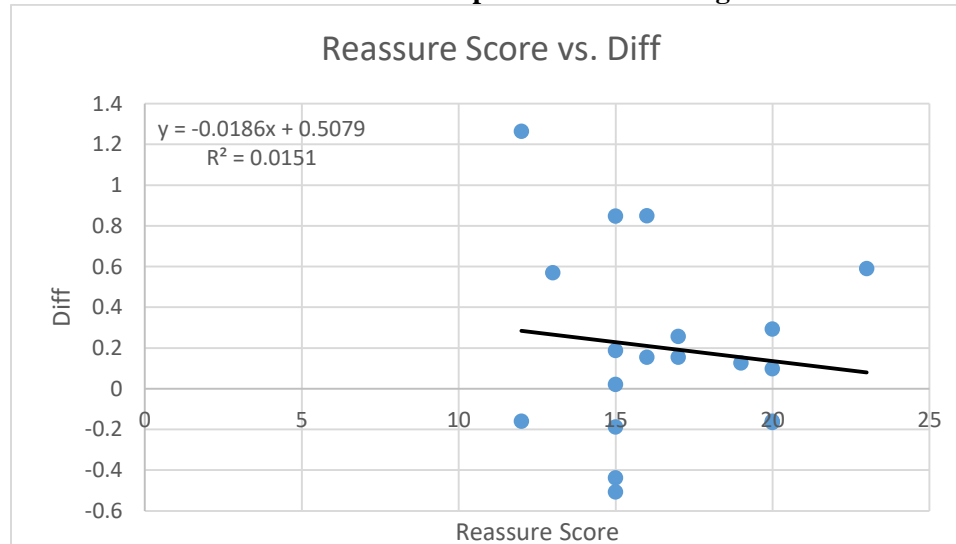**8.8. Self-reassurance score vs. Difference between expected arrow average and actual arrow average**

Figure showing correlation between the self-reassurance score and difference between expected arrow average and actual arrow average.

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