Peer effects in darts

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Abstract

This thesis uses an individual fixed effects model in UK Open of darts to measure to the effect of peers on the performance of professional darts players. To measure this data is used from the years 2017 to 2023. The average first 9 darts thrown in a leg is used as a performance measure. Form and experience are measured as control variables. To measure the effect, two individual fixed effects models are created. The first model measures the effect of the score of the opponent on the performance of the player. And the second measures the effect of the ability of the opponent on the score of the player. Neither the score nor the ability of the opponent show that there is any effect of the peer on the performance of the player. These results complement with existing research which shows peer effects in low-ability jobs, but doesn't find any peer effects in high-ability occupations such as darts.

1. Introduction

The influence of one's peers on one's performance is an important and well-acknowledged aspect of human development and accomplishment. Throughout our life, we are always surrounded by peers, whether at school, work or in our social networks. The relationships with our peers can influence our overall performance and accomplishment in a range of sectors, including academic, professional, and personal endeavors. Peer impacts on performance are complex and multidimensional, encompassing both good and negative factors that might influence our behavior, motivation, and outcomes.

Understanding the dynamics of peer influence is crucial for people, educators, and academics alike because it sheds insight on how social interactions influence our skills, goals, and successes.

This article will research the effect of peers on darts players. The effects of peers could play a significant role in the performance of a player. Peer effects in darts can significantly impact an individual's performance. The presence and behavior of peers can either enhance or inhibit performance, depending on various factors such as social facilitation and social inhibition. This could also be the case in darts. Players could perform worse due to the lack of pressure when playing against a low ability players. Or they could perform worse under pressure, which would cause them to throw better against lower ability players. Recognizing the influence of peers in darts can help players and coaches create a supportive and conducive environment that maximizes performance and fosters skill development. The following research question concludes from this:

What are the effects of peers on the performance of professional darts players?

To answer this question, I will analyze data from the UK Open, which is a darts tournament. I will study whether the performance of a player is dependent on the performance and the ability of his opponent.

The research will also be a contribution to the current literature written on peer effects. Competitive, high-sectors are less studied in peer effects. This study will contribute to this literature. This thesis will also delve into the underlying mechanisms through which these effects could operate.

This thesis starts with a review of the existing literature. After this, there will be a description of the data used in the thesis. Next, the methodology will be explained. After this, there will be a check to test the random assignment in the UK Open. Following this, the results and findings will be discussed. And at the end, there will be a conclusion with a discussion.

2. Literature review/theoretical framework

Research on peer effects has extensively examined their impact on various domains, including academic achievements and workplace dynamics. However, the literature presents conflicting findings, making it challenging to draw conclusive evidence on the functioning of peer effects. Several studies have explored the influence of peers on academic achievements, focusing on factors such as roommates' characteristics or peer interactions within classrooms.

For instance, Gordon et al. (2004) investigated the effect of roommates' academic attributes on individual students' grades in higher education. They found that average students performed worse when sharing a room with a student in the bottom 15% of the SAT distribution, while gifted students were not influenced. However, the randomness of roommate assignments was not entirely clear, and the estimated effect appeared relatively large considering the use of cumulative GPA as the dependent variable instead of the freshman GPA.

McEwan (2001) examined peer effects on student achievement using data from eighth-grade students in Chile. The author employed fixed effects models to measure the influence of peers but acknowledged the potential correlation with the error term, as sorting of students based on their characteristics could bias the results. Some schools sort students based on their characteristics. Higher-ability students get grouped and study more difficult matters than low-ability students. When sorting occurs, there will be a correlation in the error term, which results in biased results.

Similar results were found by Schneeweis and Winter-Ebmer (2007), who studied peer effects in Austrian schools. Their fixed effects model showed a significant effect of peers on reading achievements, with diminishing effects for students from higher socio-economic backgrounds. This suggested that students from less advantaged family backgrounds could benefit more from a favorable peer group. However, limitations such as measuring students only at the grade level rather than the class level might have led to the underestimation of the effects of peers.

In addition to academic achievements, peer effects have also been examined in the workplace. Mas and Moretti (2009) investigated the effects of peers in a large supermarket chain, finding a positive relationship between worker effort and the productivity of observable peers. However, the use of cashier speed as a measure of productivity might not fully capture other factors influencing performance, such as service quality. In addition, the assignment of workers was not random. The scheduling was unsystematic, but not completely random. This could result in biased effects.

Falk and Ichino (2006) conducted a controlled field experiment to study peer effects on work behavior and productivity. They found strong evidence of positive peer effects, particularly among less productive individuals, with output levels within pairs being similar and higher than in the absence of peers. The effects were particularly pronounced for less productive individuals. Nonetheless, the controlled setting of the experiment raises concerns about its external validity, and the study focused on simple tasks that may primarily apply to low-ability workers.

Cornelissen et al. (2017) noted that existing research on workplace peer effects is often limited to specific settings or occupations, such as laboratory experiments or data from a single company or occupation. To address this, they utilized a comprehensive dataset covering workers and firms over nearly two decades to measure peer effects on wages. They use wages instead of productivity to measure the effect of peers, this differs from other studies. The findings indicated small average peer effects on wages, with a stronger impact observed in low-skilled occupations. Additionally, they found that peer pressure, rather than knowledge spillovers, primarily drove these effects in low-ability occupations.

In contrast to these papers, Guryan et al. (2009) found no effect of peers in the workplace. They studied peer effects in golf tournaments, they utilized the random assignment of playing partners in golf tournaments to overcome some challenges of identifying peer effects. Most studies address peer effects in low-skilled occupations, while these authors study the effect on a high-skilled labor market. Players in golf get paid based on their performance. They also try to determine the difference between motivational and learning peer effects. A player could learn the direction of the wind or see slopes when others hit. Motivation could also have an impact, visualizing a good shot could motivate a player to do better. To differentiate between these effects, the authors assume that a player cannot learn how to hit longer drives by playing alongside longer putters. One could argue that this assumption could be wrong, one could still learn by watching the wind direction of a longer putter. The authors conclude that social incentives may serve as substitutes for financial incentives in certain contexts. This would explain why many studies show peer effects in low-ability occupations, while less evidence is found when studying high-paying, high-ability jobs.

While these studies shed light on peer effects, they reveal that peer influence is more prominent among low-ability individuals in both academic and workplace settings. The precise mechanisms through which peer effects operate remain unclear, although some publications attempt to identify the channels involved.

Lavy and Schlosser (2011) focus more on the mechanisms through which peers operate. They investigated the impact of female students on academic achievement and found positive

associations with factors such as improved classroom dynamics, reduced disruption, and higher-quality teacher-student interactions. The authors do not determine the relative weight of each mechanism or exclude the possibility of other factors at play. Because of this, we cannot highlight which are the main mechanisms through which peer effects operate.

Dahl et al. (2014) highlighted information transmission as a key mechanism driving peer effects in program participation. The study lacks subjective expectations and individual information sets. This makes it difficult to determine the exact type of information transmission which drives peer effects. The authors expect that a worker's boss transmits the most valuable information.

In conclusion, the current body of research on peer effects indicates a stronger influence on low-ability students and workers in low-skilled occupations. The specific mechanisms through which peer effects operate differ between education and program participation. Understanding these mechanisms is crucial for leveraging peer effects to improve performance. However, limited research exists on the mechanisms of peer effects in the workplace. This thesis aims to contribute to the literature by studying the effects of peers in a high-ability workplace, focusing solely on motivational mechanisms. By examining the impact in a context where learning from peers is not applicable, such as darts, the thesis intends to provide insights into the motivational aspect of peer effects on performance. In addition, are peer effects understudied in competitive, high-ability occupations. This study will contribute to this literature as well.

3. Data description

To better understand this research, I am going to explain the rules of a game of darts. In the UK Open, the games are decided by who can win the most amount of legs. The first three rounds are the best of 11 legs. The fourth, fifth and sixth rounds are the best of 19 legs. As is the case for the quarter final. The semifinal and final are the best of 21 legs.

When playing a leg, both players start with a score of 501. The goal of the leg is to be the first to get to zero, you have to finish exactly on zero. To score points, a player can throw on a board with the numbers 1 through 20 and an outer bull and bullseye. Outer bull is worth 25 points and bullseye is worth 50 points. Each number also has a double or a triple, which is harder to throw, but can score you more points. Each throw a player has three darts to score points. For example, a player can score triple 20, single 1 and double 5. This gives him a score of 71. Which leaves 430 left to throw is his leg. To finish a leg, you have to finish the exact score, but you need to finish with a double, or

bullseye. When a player has 60 points left in his leg, he cannot finish with triple 20. He could finish with single 20 and then double 20.

The maximum amount of points a player can throw is 180. The minimum amount of darts needed to finish a leg are 9 darts. There is an advantage in a leg when throwing first. So each leg the players switch who starts first.

The data used in this paper is drawn from Dartsorakel. This database contains different statistics on matches played in darts. I have gathered data from every match in the UK Open since 2016. This means there is panel data that tracks the performance of players over time.

For each match in the dataset, I have gathered the first 9 average darts thrown from the player and from the opponent. This is the average score thrown with the first 9 darts a player uses in a leg. I decided to use the first 9 average and not the average score. This is measured at the end of the game. I have chosen the first 9 average as a performance measure because the first 9 darts cannot directly be influenced by the score of the opponent. While this is not the case with the average score. The finishing darts are usually the one which lower the average score. When an opponent is really good at finishing, the player doesn't get any finishing darts. This increases the average score of the player. This is how an opponent would directly influence the score of the player. When using the first 9 average, the opponent has no possibility to influence this. The reason that I don't want the opponent influencing the score of the player is because I solely want to measure the social peer effects of players. In this thesis I will also use score to refer to the first 9 average.

Table 1. Descriptive statistics data UK Open

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
First 9 average	1586	99.033	8.791	58.5	122.58
First 9 average opponent	1586	99.024	8.785	58.5	122.58
Form Player	1586	0.210	0.862	-1	1
Experience Player	1586	611.639	1286.843	0	10353.55
Ability Player	1586	2.653	1.394	1	5
Ability Opp	1586	2.653	1.394	1	5
ID Player	1586	138.619	77.781	1	277

In total, there played 352 different players in this competition. Unfortunately, not all the data is available from every player. For 75 players there is no data on performance, this is why I decided to exclude these players from the dataset. This decreases the number of players to 277, as you can see in table 1. There are 793 games observed in total, excluding the games which I excluded due to the lack of performance data.

I also gathered data on the prize money won by each darter. I have gathered different metrics of this data. I have the data on the lifetime earnings of each player. I also have data on earnings in the last year. I will use this data to measure different variables.

To make sure that the data is representative, I need to use random assignment. That's why every data point used is from UK Open. This is the only tournament in darts that has random assignment after each round. The tournament is structured in a specific way, in total there are 9 rounds played in the whole tournament. There are different ways to qualify for the UK Open. I have divided these into 5 categories. The first category is qualifying by being in the top 32 of the Order of Merit, this will cause a player to enroll in the fourth round. The second category is when a player is ranked 33-64 in the Order of Merit. These players will enroll in the third round. The next category is the players ranked 65-96 in the Order of Merit, they will enroll in the second round. The fourth category is the players ranked 97-128 in the Order of Merit, they will enroll in the first round. The fifth category is players who qualified any other way. This could be via the amateur qualifiers, the development tour, or the challenge tour qualifier. They will also enroll in the first round. The Order of Merit is a ranking used by the Professional Darts Corporation to rank the players. This is done by measuring the amount of prize money won in the last 2 years.

The different categories I mentioned are also a way to rank the differences in the ability of a player. Players in the first category are ranked with a 1 in ability, and players in the 5 category are ranked with a 5 in ability. All the variables are also defined in the appendix.

4. Methodology

The research design for this thesis involves utilizing an individual fixed effects model to measure the effect of peers in darts on performance. This approach allows us to control for time-invariant individual characteristics and focus on within-individual variations in peer influence. We control for every variable that doesn't change over time by using the individual-specific constant. The advantage of this is that we only need to control for variables that change over time.

I will include a time dummy in the individual fixed effects model, this will control for all the time specific factors that might influence our dependent variable. I will use the different years as a time dummy. This will control for factors such as the impact of covid-19 or the Brexit, which could have an impact on the performance of the players.

Most variables stay the same, but some variables might vary over time. The time-varying variables that I am going to control for are experience and form. Measuring these variables is difficult. To measure experience, I will use the total amount of prize money which the players won in their darts career. I would argue that this is the best method to measure experience. The tournaments with more pressure, where you gain the most experience, are the tournaments which pay out the most money when a player succeeds. There will be 5 moment that this variable will be measured, this is at the start of each year.

Form will be measured based on the ranking of the total prize money won. Since the UK Open is played once per year, the form of the previous year will be used to predict the form of the player. The variable form can contain 3 values: 1, 0, -1. These values stand for good, normal and bad form respectively. Form is measured by comparing the ranking of the player with the ranking of the year before. When they are ranked higher, they will have good form. When ranked the same, they will have normal form and when ranked lower, they will have bad form. When a player is not mentioned on the ranking, the player will have normal form. When a player is mentioned on the ranking, but is not mentioned the year before. They will have good form.

The individual effects model will look like this:

(1) $Score_{it} = a_i + \beta Ability_{it} + \rho Opp\_Score_{it} + \mu Experience_{it} + \theta Form_{it} + \gamma_t + \varepsilon_{it}$

Where i indexes players, t indexes time, a_i indexes the individual fixed effects, β, ρ, μ,and θ are parameters, γ_t is a time dummy and ε_{it} is an error term. The parameter β measures the effect of the ability of the individual on the score of the individual. The parameter ρ measures the effect of the score of the opponent on the score of the individual. The parameter μ measures the effect of the experience of the individual on the score of the individual. The parameter θ measures the effect of the form of the individual on the score of the individual.

I will also include another model. The model above only tests what the effect is of the score of the opponent on the score of the player. I created a similar model to test what the effect is of the ability of the opponent on the score of the player. This model will look like this:

(2) $Score_{it} = a_i + \beta Ability_{it} + \rho Ability\_Opp_{it} + \mu Experience_{it} + \theta Form_{it} + \gamma_t + \varepsilon_{it}$

Of course, there are concerns when using an individual fixed effects model. Measurement error problems are bigger if one looks at within-individual changes. With an individual fixed effects model you take differences between time periods. When a mistake is made in the measurement of one data point, the mistake will impact more data.

5. Randomization

Random assignment is essential when measuring this effect. When studying a tournament without random assignment the results would be biased. When a tournament draw is not random, a high-ability player is more likely to face a low-ability player. Since higher ability individuals generally have a higher score, the results would show that playing against a low-ability player will result in a higher score. This conclusion would not be correct. The correct conclusion here would be, being a higher ability player results in a higher score. That's why I decided to use the UK Open. This tournament has a random draw in every round.

To make sure the assignment is really random, I will run a test. This test is used to measure correlation between the ability of an individual and the ability of his opponent. Usually you would just run a regression with ability as the dependent variable and the ability of the opponent as the independent variables, like the one below.

(3) $Ability_{it} = \alpha + Opp\_Ability + \varepsilon$

This regression will show that there is a correlation between the ability of a player and the ability of his opponent. This would suggest that the assignment is not random. But this regression has a few problems. The round in which players are in is correlated with ability. If you would have a regression with just these variables, you would find that a player with an ability of 5, which is the worst, is more likely to have a low ability opponent. This is because low ability players are often not good enough to go through to the next round, where more high ability players are.

Secondly, also mentioned by Guryan et al. (2009). A player cannot play against himself. Which means that a high ability player is always more likely to play against a low ability, than a low ability player is to play against a low ability player. This could cause someone to draw the wrong conclusions. That's why I changed this regression. I added a variable which measures the average ability in the round without the ability of the player included. The newly created regression is displayed below.

(4) $Ability_{it} = \alpha + Opp\_Ability + Average\_Abiilitywithoutplayer + \varepsilon$

To ensure that random assignment takes place in the draw in the UK Open, I ran this regression on the experience, the form and the length of the name of the dart players.

The results of these regressions are shown in table 2 The results of regression one shows that in regression 1, there is a correlation between ability and the ability of the opponent. As shown in table 2, the coefficient is 0,577 and is highly significant. This is also the case for experience and form. Where the coefficients are 0,130 and 0,346 respectively. These are also highly significant. This would suggest that there is no random assignment. But as mentioned earlier, that's what was predicted.

That's why the second regression was created. As you can see in table 2. Regression two shows no significant coefficient in Average(X) of the opponent. This means that none of the tested variables show any correlation between each other. Which indicates that there is random assignment in the UK Open.

Table 2. Randomization regression

	Ability	Experience	Form	Length of name
Regression one:				
(X). Opponent	0.577***	0.130***	0.346***	0.024
	(0.021)	(0.021)	(0.025)	(0.025)
Regression two:				
(X). Opponent	-0.004	0.001	-0.011	0.032
	(0.026)	(0.023)	(0.026)	(0.025)
Average-round-without-player	0.978***	0.554***	0.953***	-0.319*
	(0.034)	(0.052)	(0.042)	(0.133)

Note. N=793. (X), Opponent is the value of the variable displayed in the top row. Average-round-without-player is the average of (X) in the round without the value of the player. The standard errors are included in the parentheses. * p < .05. ** p < .01. ***p < .001.

6. Results

The results of the individual fixed effects models can be found in table 3 and table 4. The model which is specified in equation 1 can be found in table 3, in the fourth column. The first 3 columns show the same model with or without certain control variables. As you can see is there no significant effect between the score of the player and the score of the opponent. There is also no significant effect of the ability of the player or the experience or the form of the player. The individual fixed constant is highly significant, which shows an effect of 103,670.

More interesting are the time dummies. Some of them show an significant effect. The year 2018 shows a coefficient of -5,637 which is highly significant. This means that the players had a 5 decrease in first 9 average in 2018 compared to 2017. You could also notice that the years 2019 and 2022 differ significantly from the year 2017. With coefficients of -2,874 and -2,969 respectively. They are less significant than the effect in 2018, but are still significant within the 5% level.

Table 3. Fixed effects model 1

	(1)	(2)	(3)	(4)
Ability	-0.093	-0.096	-0.095	-0.099
	(0.364)	(0.366)	(0.376)	(0.378)
First 9 Average	-0.019	-0.019	-0.019	-0.019
Opponent	(0.022)	(0.022)	(0.022)	(0.022)
Experience Player		-0.000		-0.000
		(0.001)		(0.001)
Form Player			-0.168	-0.021
			(0.362)	(0.363)
2018	-5.659***	-5.628***	-5.667***	-5.637***
	(1.490)	(1.465)	(1.467)	(1.445)
2019	-2.915*	-2.867*	-2.922*	-2.874*
	(1.233)	(1.231)	(1.218)	(1.220)
2020	-1.834	-1.773	-1.845	-1.785
	(1.276)	(1.307)	(1.273)	(1.305)
2021	-0.876	-0.803	-0.889	-0.816
	(1.272)	(1.341)	(1.266)	(1.335)
2022	-3.041*	-2.958*	-3.052*	-2.969*
	(1.244)	(1.339)	(1.239)	(1.335)
2023	-2.624	-2.527	-2.658	-2.565
	(1.331)	(1.450)	(1.427)	(1.530)
Constant	103.631***	103.639***	103.656***	103.670***
	(2.524)	(2.534)	(2.534)	(2.549)

Note. N=1586. Column 4 shows the model as specified in equation (1). The other columns represent the same equation only with or without specific control variables. The standard errors are included in the parentheses. . * p < .05. ** p < .01. ***p < .001.

When looking at table 4, you will find similar results as in the third table. There are no significant effects of the ability, the ability of the opponent, the experience of the player and the form player. Similar to the first model, the fixed effects constant is highly significant and has a coefficient of 101,595. The time dummies also show that there is a significant difference in the year 2018., with a coefficient of -5,606. This model also shows a significant difference in the years 2019 and 2022. These shows coefficients of -2,906 and -3,016 respectively. These are significant within the 5% level. They are less significant than the effect which 2018 has on the average, which is significant within the 0,1%.

Table 4. Fixed effects model 2

	(1)	(2)	(3)	(4)
Ability	-0.132	-0.133	-0.133	-0.134
	(0.381)	(0.381)	(0.392)	(0.393)
Ability Opponent	0.127	0.127	0.127	0.127
	(0.176)	(0.177)	(0.176)	(0.177)
Experience Player		-0.000		-0.000
		(0.001)		(0.001)
Form Player			-0.007	-0.009
			(0.363)	(0.364)
2018	-5.618***	-5.602***	-5.621***	-5.606***
	(1.497)	(1.475)	(1.473)	(1.455)
2019	-2.928*	-2.903*	-2.931*	-2.906*
	(1.239)	(1.241)	(1.224)	(1.229)
2020	-1.879	-1.848	-1.884	-1.853
	(1.285)	(1.317)	(1.279)	(1.312)
2021	-0.931	-0.893	-0.936	-0.899
	(1.274)	(1.344)	(1.265)	(1.336)
2022	-3.055*	-3.012*	-3.060*	-3.016*
	(1.256)	(1.355)	(1.250)	(1.351)
2023	-2.655*	-2.604	-2.669	-2.620
	(1.335)	(1.460)	(1.431)	(1.538)
Constant	101.582***	101.581***	101.592***	101.595***
	(1.412)	(1.412)	(1.497)	(1.501)

Note. N=1586. Column 4 shows the model as specified in equation (2). The other columns represent the same equation only with or without specific control variables. The standard errors are included in the parentheses. . * p < .05. ** p < .01. ***p < .001.

These results raise the question why the dart players underperformed in the years 2018, 2019 and 2022. To identify this, I need to determine what the difference is between these years and the years 2017, 2020, 2021 and 2023.

There are notable differences between various years in terms of qualifying criteria for the UK Open, potentially leading to variations in the quality of players. For instance, in 2021, there were no amateur Rileys qualifiers. However, even when accounting for the average ability of players in each round, the statistical analysis indicates similar coefficients and significance levels across different years.

Another distinction among the years is the presence or absence of spectators. The tournaments held in 2018 and 2021 were played behind closed doors due to different reasons. Storm Emma and the COVID-19 pandemic, respectively. While the impact of closed-door events was significant in 2018, it showed no effect in 2021. One could argue that the predictability of a closed-door event in 2021 might have influenced player performance compared to the less predictable circumstances of 2018, potentially causing mild shocks due to weather conditions.

Additionally, the number of participants changed in 2019, increasing from 128 to 160 players. This change could have also affected the dynamics of the tournament. However, if this were the case, one would expect consistently negative and significant effects in all years from 2019 onwards, which is not observed. Hence, the negative and significant effects remain unexplained.

However, the primary focus of this research is to examine whether professional darts players are influenced by their peers. The analysis in Table 3 reveals that the opponent's first 9 average score has a coefficient of -0.019, but it is not statistically significant. This suggests that the opponent's score does not impact the player's performance. Similarly, Table 4 shows that the opponent's ability coefficient is 0.127, but it is also not statistically significant. These results imply that the player's performance is not influenced by the skill level of their opponent. Hence, it can be inferred that the player's peers do not have an effect on their performance.

As mentioned earlier is motivation the main mechanism through which peer effects would operate in darts. These results suggest that players have no extra motivation when playing against players who differ in their ability. Or have any extra motivation when playing against players who throw a higher score. Similarly Guryan et al. (2009) concluded that social incentives may serve as substitutes for financial incentives. This could be the case for darts as well. Since there are significant financial incentives, are the social incentives such as motivation neglected.

7. Discussion & Conclusion

To test whether peers affect the performance of professional darts players, I ran an individual fixed effects model. Using the data from the UK Open of darts from the years 2017 to 2023. To identify the effect of peers, I ran two individual fixed effects model. The first model tested the effect of the score of the opponent on the score of the player. The second model tested the effect of the ability of the opponent on the score of the player. Since this is an individual fixed effects model, there are only control variables necessary to control for the time-varying variables. That's why I also controlled for the experience a player has and the form a player is in. These two both change over the years.

This thesis found no significant effect of peers on the performance of players. In neither models was there a significant effect found. These results were found as expected, given the current literature. Most research has a difficulty finding peer effects in high-ability jobs. Such as darts.

When reading this thesis one could argue that the form of the player is not measured well. It is only measured in 3 different values. Good, normal or bad. And it's based on the overall performance of the last year, and then compared with the year before. One could argue that this is not representative of the real form of the player. When a player lowers in the rankings it doesn't differentiate if he drops 1 place or 100 places. Ideally you would want to see retired darts players, you could see the best year and the worst year and base your form variable around these years. Unfortunately, there is not enough data available to do this.

One could also mention that experience is not well measured. Due to the fact that the total amount of prize money won is also correlated with the amount of talent the players has. Ideally, you would also base experience on the total amount of years played in professional darts. But unfortunately, there was no data available on this.

There could also be other individual factors that are not taken into account. For example when an individual player has health problems in a specific this influences the performance of that year. Additionally, this would also influence the form variable in the years after this.

What I did find out was that there is a possible correlation between extreme weather conditions and the performance of players. The effect of weather conditions on the performance of players might also be an interesting topic to study.

This thesis contributed to this literature by studying peer effects in a sector that has not been studied yet. While only focusing on motivational mechanisms. Finding no effects in a high-ability occupation.

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Appendix

Name	Description
Average first 9	The average score a player throws with the first 9 darts in his leg. This variable is often also referred to as score. This is the performance measure. This variable is measured at the end of each match.
Ability	The level of ability of a player is based on the way of qualifying for the UK Open. There are 5 different ways to be qualified, so the level of ability is separated by 5 levels.
Experience	The level of experience is based on the amount of money won in the career the darts player.
Form	The form of the player is based on the ranking in the total amount of prize money won. It is divided in three categories. Good, normal and bad. When a player is ranked higher than last year, the player have good form. When ranked lower, the player will have bad form. When the rank stayed the same, they will have normal form. When a player is not mentioned on the ranking, the player will have normal form. When a player is mentioned on the ranking, but is not mentioned the year before. They will have good form.
Average round without player	This is the average of any variable mentioned which is found in that specific round when the score of the player is excluded.
Order of Merit	The order which is used by the Professional Darts Corporation to rank the ability of the players. This ranking is based on the prize money won in the last 2 years in any tournaments organised by the Professional Darts Corporation.

Rileys Qualifiers	A tournament to qualify for the UK Open of Darts. Anyone could join these qualifying tournaments.