

QSS Honors Program Experience 2023-2024

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“Investigating the Instagram Comments of Professional Soccer Players: The Impact of Social Media on Athletic Performance”

What I Did/What I Learned:

For my QSS Thesis, I studied the effect negative social media commentary had on professional athletes' gameday athletic performance. More specifically, I compiled the Instagram comments of professional soccer players in England's Premier League and assessed whether the sentiment/content of those comments predicted how well those players performed in specific match performance metrics, such as passing completion percentage and yellow cards. I was inspired by the multitude of interviews with athletes expressing the negative effect social media has on their mental health, as well as the numerous connections drawn in the relevant academic literature connecting mental health with athletic performance. Based on the content of these interviews, I wondered if a player's performance “stats” in their weekly matches were at all reflective of the social media commentary they had received in the week prior.

I also was inspired to study this question because I knew it was an opportunity to apply some of the more advanced machine learning/sentiment analysis techniques I had been learning about in my QSS coursework to real academic research, where using those techniques would materially impact the ability to answer the research question and also push the literature forward (as existing research into social media and athletic performance used far more basic techniques).

My thesis aimed to answer the following question: Does the sentiment and content of athletes' Instagram comments impact their matchday performances over the course of a season. To do this, I used Python to webscrape all of the Instagram comments professional soccer players in England's Premier League received during the 2022/2023 season. I focused on defenders (making stats easier to compare between players), and aggregated the comments for each match. I used a tool called LangDetect to analyze the language each comment was posted in, and I used rule-based and machine-learning based sentiment scoring techniques and topic modeling (VADER, LDA, BART, etc) to assign scores to each comment in the dataset. These scores reflected negative attributes like sentiment, toxicity, racism, sexism, homophobia, vulgarity, etc. I aggregated the dataset further such that for each player, for each matchweek, I had both an average and volumetric content/sentiment score. For my analysis, I used both linear and machine-learning based regression models (ML model was called CatBoost) to determine if there was a causal relationship between these scores and the stats players received in the matches. I ultimately found no evidence that the topic/sentiment scores had any causal impact on a player's in game performance stats, thus supporting my null hypothesis.

What I Learned:

My findings suggest that sentiment scores derived from a player's Instagram comments do not predict match-day performance, however future research is needed to confirm these findings. However, even if the negative impacts of social media commentary are not visible in the in-game statistics of professional Premier League athletes, it should not be assumed that negative commentary is not harmful to these athletes in ways that my work did not pick up on. My literature review and later research overwhelmingly supported what we all know: abuse on social media is unacceptable and should be treated accordingly. Social media platforms should step up efforts to moderate racism, homophobia, and other forms of vulgarity and abuse on social media, with particular focus on the pages of professional athletes and other celebrities/well known figures .

Why I Did It:

Like many, I chose to write a thesis because I considered it the best culmination to my studies at Dartmouth. I thought writing a thesis was the best way to test the skills I had gained in the QSS major and at Dartmouth in general, as well as challenge myself to produce, for the first time, a real piece of academic literature that actually moved research in a subject area forward. I also wanted to use the thesis to test out my interest in pursuing a career in academia down the road. Finally, I also saw the thesis as an opportunity to work day in and day out with an advisor truly at the forefront of the field of sentiment analysis and social media research, which is a subject I have been interested in for a long time.

Advice For Future Thesis Students:

1. Pick an advisor the same way you choose a topic

At the very beginning of the thesis process, I was told to pick a topic that I was really, really interested in. I was told that it isn't worth writing a thesis unless you have an idea you are sure you want to dedicate a year of research to. I think this is generally good advice, but I think you need to pick an advisor the same way. You need to pick an advisor that you are truly so excited to work with week in week out on your thesis. I feel like I personally got very lucky in this respect and it really made my thesis experience (as well as my actual thesis) what it was.

2. There will be surprises along the way

The QSS thesis program does a very good job requiring you to plan out your work. The program also does a very good job making sure you are realistic about what you can accomplish. However, I found that no matter how well you plan, there will inevitably be challenges that come up that you just have to figure out.

Personally, it took me way longer than I expected to actually collect my Instagram data because the Python tool I was using kept getting blocked by Instagram's security team. I literally had to use my mom's Instagram account because somehow it had the perfect profile to not be flagged. It took forever to solve this issue and I at times was afraid I would totally fail to finish. In these moments, I would encourage all of you to remember that everyone goes through the

same struggle, and that you will be able to get it done. There is a way through, and a way forward. That said, it is also best practice to avoid these surprises as much as possible.

3. Get things done over Christmas and March break

I will keep this one brief, but I would highly encourage anyone writing a thesis to spend the time they have to work on their thesis during breaks actually working on their thesis. I did a horrible job of this over December break and then spent all of the winter trying to catch up. I then did a great job of this over March break and spent the spring term working hard but never falling too far behind. It is hard to motivate to work, especially when you have so much time off, but trust me when I say it is worth it.

4. Null isn't bad

I want to address the prospect of getting a null result (as I did). Nobody goes into a thesis expecting to find nothing. I was certain that I would be able to find at least a small effect. But I didn't. But what I learned is that even though I didn't find an effect, my research design was strong enough that this null result was still an important finding rather than being a sign of poor academic work. I would encourage thesis students to not fear null results, but rather to think about the question: if this result is null, did I do enough work/robustness checks to support the null finding as something interesting rather than just an error?

5. Meet once per week with your advisor

Just do it. I don't need to explain. Just do it.

All in all, writing a thesis takes a ton of time and thoughtfulness, but it is also the most rewarding academic work you can do as an undergraduate student at Dartmouth. It is also something that provides a great culmination on everything you have learned up until that point, and something you can take home, show your family, and have forever. It is also very nice to present your findings to all of your friends (as I am sure those of you considering writing a thesis have attended in the past). I would encourage anyone who is even on the fence about doing a thesis to go ahead and do it. I have no regrets and I don't know anyone else who wrote a thesis and wished they hadn't. My thesis was easily the most rewarding part of my academic career at Dartmouth and I would recommend the experience wholeheartedly.

If you are debating whether or not to pursue a thesis, have questions about my work, or have questions about QSS in general, feel free to contact me at samcwinchester@gmail.com or call/text me at 978-500-3579.