

Analyzing Public Sentiment on Controversial Sports Events in YouTube Comments

1 Samples of Comments

We have attached the tables for a sample of annotated comments from our dataset.

Table 1: Shows examples of **Favor**, **Against**, **Neutral**, *Irrelevant* from our dataset.

Table 2: Shows examples of a much detailed division of **Favor** and **Against** labels, namely, **Direct Praise**, **Direct Criticism**, **Indirect Praise**, and **Indirect Criticism**.

Table 3: Compares the number of samples of **Favor** and **Against** labels, namely, **Direct Praise**, **Direct Criticism**, **Indirect Praise**, and **Indirect Criticism**.

Table 4: Provides a statistical summary mapping detailed sub-categories to the main sentiment labels for Maradona Event.

Table 5: Provides a further statistical summary mapping detailed sub-categories to main sentiment labels for the Luis Suarez Event.

Table 6: Provides a further statistical summary mapping detailed sub-categories to main sentiment labels for the Frank Lampard Event.

Event	Favor	Against	Neutral
<i>Frank Lampard Ghost Goal</i>	<ol style="list-style-type: none"> 1. Germans can't say anything about unsporting behavior. 2. What a disgrace this Manuel is. 3. Could have been one of the greatest games. 	<ol style="list-style-type: none"> 1. The 1966 ghost goal had to be paid for. 2. Payback for the 1966 final 3. Even Geoff Hurst said his goal didn't count. 	<ol style="list-style-type: none"> 1. This was way more clear-cut than 1966. 2. Inconclusive! Just couldn't get a good angle. 3. I remember this game.
<i>Luis Suárez Handball</i>	<ol style="list-style-type: none"> 1. Morality always loses, and nice guys finish last. 2. I just love Luis Suarez with all his behaviors I don't know why. 3. By apologizing, he would look stupid. 	<ol style="list-style-type: none"> 1. Suárez cost Ghana the World Cup semi-final. 2. This man was often mentally unstable. 3. Hand of Satan. 	<ol style="list-style-type: none"> 1. He will never step foot in Ghana. 2. That was back then, now there's goal-line technology. 3. It's part of the game.
<i>Maradona Hand of God</i>	<ol style="list-style-type: none"> 1. Yup. Goalies s*cked these days. 2. The Real OG of all times. 3. Number 15 goal is something else...my favourite. Bravo. 	<ol style="list-style-type: none"> 1. Errrrr! Hand of god? Cheater. 2. He makes the opponent look so stupid and clumsy. 3. The most cheating player in football history. 	<ol style="list-style-type: none"> 1. When the football was football. 2. Back in the day nobody could play football, that's why he appeared to be that good. 3. You will never be able to pick one between Maradona and Messi.
<i>Jonny Bairstow Run-Out</i>	<ol style="list-style-type: none"> 1. That's not cheating, that's the way of winning. 2. They gave Jonny ample time to stop walking out of his crease, so fair game! 3. Jonny was too quick to get out of the crease, so it is totally a fair decision. 	<ol style="list-style-type: none"> 1. Same old Aussies, always cheating. 2. Australia cheating again. Who could have seen that coming? 3. Not cheating, just bad sportsmanship. 	<ol style="list-style-type: none"> 1. The lesson for the players is "pay attention." 2. Growing up in Australia, we were taught to throw the ball at the batters' head if they left their crease like this. 3. This is just pure drama and I love it.
<i>Ashwin Mankadding</i>	<ol style="list-style-type: none"> 1. If a bowler can keep his foot inside the crease, a batsman can wait with the bat inside the crease until the ball is bowled. What's wrong with that? 2. This is out according to the rule. 3. Great presence of mind... genius of the game. 	<ol style="list-style-type: none"> 1. If you Mankadding, you should be ashamed of yourself. 2. Not a fair runout considering sportsmanship and the spirit of the game. 3. This rule is absurd. How can you be allowed to run out someone without delivering the ball? 	<ol style="list-style-type: none"> 1. Ashwin merely expressed his disappointment but never wanted a wicket that way. 2. Whenever a batsman leaves the crease, he gets 1 to 2 ft benefits in running. 3. Batters don't do it on purpose; they walk out expecting the bowler to deliver the ball.
<i>The Underarm Incident</i>	<ol style="list-style-type: none"> 1. That time, it was legal to bowl underarm according to the rules. 2. The bottom line is that there was nothing in the rules at the time saying you can't bowl underarm, so technically, nothing wrong was done. 3. Well, if they were allowed to do it, then fair play to them. 	<ol style="list-style-type: none"> 1. That was against the spirit of the game! Couldn't they just bowl a normal delivery? 2. The greatest cowards in the world... None other than the Aussies. 3. Poor sportsmanship. 	<ol style="list-style-type: none"> 1. What were the exact rules for underarm deliveries back then? 2. Carrying on about something decades later as if it's relevant today is the real injustice. 3. Greatest highlight in cricket history, great footage.

Table 1: Examples of Favor, Against, and Neutral Comments for Controversial Events

Table 2: Examples of Direct Praise, Indirect Praise, Direct Criticism, and Indirect Criticism

Event	Direct Praise	Indirect Praise	Direct Criticism	Indirect Criticism
<i>Maradona Hand of God</i>	Maradona is sooo good.	13 was simply incredible.	3 was handball. Not a goal. A cheat.	You forgot to add the Hand of God goal.
	An effervescent talent.	The legend forever.	Goal 12 looks like a huge offside.	Back when players played for the crowd, not money.
	The legend forever.	Back when players played for the crowd, not money.	Cheating and poor goal-keeping.	Bro forgot aim bot on.
<i>Luis Suarez Handball</i>	Suarez is a legend... but seeing Asamoah after the match broke my heart.	I'm not a big fan of his but I respect him for keeping the ball from going in!	Suarez crushed so many African dreams.. absolutely criminal.	Sleepless nights for a month
	Suarez is a genius.	He did what he had to do for his country.	Absolute scumbag play.	Chana would have won if it weren't for the handball.
	I always that this was his karma for his biting incident with chiellini but beyond all that, he is one of the best predator in front of the goal and still is today.	Anyone would have done that though.	Suarez will forever be the biggest disgrace in modern football.	It's funny though because both Argentina and Uruguay cheated and both got what they had coming.
<i>Frank Lampard Ghost Goal</i>	They were voted the most entertaining team on FIFA.com.	It took 12 years, but Germany got their karma at last.	I hate Germany for what they did, it is so sad.	Wouldn't have made a difference; I'm English, and we would have lost anyway. Germany were by far the better team.
	Wouldn't have made a difference; I'm English, and we would have lost anyway. Germany were by far the better team.	OSCAR-winning performance from football.	England defended like a bunch of girls.	With all the technology today, this would never happen now.
	My idol was Frank Lampard, and I'm so happy to see, but that referee was an absolute disgrace, blind, and should go to the eye doctor.	This is the reason why FIFA needs VAR...	That's just poor by the officials... smh.	The revenge has been taken.

Table 3: Comparison of Events for Maradona, Frank Lampard, and Luis Suarez

Event	Direct Criticism	Direct Praise	Indirect Criticism	Indirect Praise	Slang Usage	Racial Abuse
Maradona	12	45	23	34	10	5
Frank Lampard	8	50	18	40	7	3
Luis Suarez	15	30	25	28	12	8

Table 4: In-depth Comparison of Stance Labels against Direct/Indirect Praise and Criticism (Maradona)

Sub-category	E=0 (Favor)	E=1 (Against)	E=2 (Neutral)	E=3 (Irrelevant)
Direct Criticism (H=1)	0	18	0	0
Direct Praise (I=1)	38	0	0	0
Indirect Praise (K=1)	8	3	5	0
Indirect Criticism (J=1)	0	6	4	2
Slang Use (L=1)	5	6	1	6
Racial Abuse (M=1)	3	4	0	0

Table 5: In-depth Comparison of Stance Labels against Direct/Indirect Praise and Criticism (Luis Suarez)

Sub-category	D=0 (Favor)	D=1 (Against)	D=2 (Neutral)	D=3 (Irrelevant)
Direct Criticism (I=1)	0	34	1	1
Direct Praise (J=1)	18	3	2	0
Indirect Praise (L=1)	4	3	2	0
Indirect Criticism (K=1)	1	8	6	1
Slang Use (M=1)	3	6	2	5
Racial Abuse (N=1)	0	5	0	2

Table 6: In-depth Comparison of Stance Labels against Direct/Indirect Praise and Criticism (Frank Lampard)

Sub-category	H=0 (Favor)	H=1 (Against)	H=2 (Neutral)	H=3 (Irrelevant)
Direct Criticism (I)	0	27	0	0
Direct Praise (J)	7	0	0	0
Indirect Criticism (K)	2	0	14	30
Indirect Praise (L)	2	1	0	0
Slang Use (M)	8	20	7	0
Racial Abuse (N)	0	0	0	0

2 Logistic Classifier Performance on Model Probing

Event	Model Type	Accuracy	Top Token	Layer	AUC
Frank Lampard	Fine-Tuned	86%	exact_answer_first_token	1-6	0.9993
	Not Fine-Tuned	44.25%	first_answer_token	31	0.8973
Luis Suarez	Fine-Tuned	82.5%	exact_answer_last_token	16-20	0.9901
	Not Fine-Tuned	31%	exact_answer_first_token	11, 31	0.8249
Maradona	Fine-Tuned	56%	exact_answer_first_token	25	0.8468
	Not Fine-Tuned	44%	exact_answer_first_token	31	0.9431

Table 7: Logistic Classifier Performance Metrics across Different Events. The table shows the accuracy, most informative token positions, layers with highest performance, and AUC values for fine-tuned vs. non-fine-tuned models. Note how fine-tuned models consistently show higher accuracy and tend to focus attention on the exact answer tokens.

Event	Model Type	F1 Score	Top 5 Accuracy Layers/Tokens
Frank Lampard	Fine-Tuned	0.96	Layer 1-6, exact_answer_first_token, Acc: 0.975
	Not Fine-Tuned	0.916	Layer 31, first_answer_token, Acc: 0.8625
Luis Suarez	Fine-Tuned	0.944	Layers 16-20, exact_answer_last_token, Acc: 0.975
	Not Fine-Tuned	0.842	Layer 10/14, exact_answer_last_token, Acc: 0.775
Maradona	Fine-Tuned	0.773	Layer 25, exact_answer_first_token, Acc: 0.7875
	Not Fine-Tuned	0.872	Layer 31, exact_answer_first_token, Acc: 0.875

Table 8: F1 Scores and Top 5 Accuracy Results from Probing Analysis. This table highlights the different levels of attention concentration in fine-tuned vs. non-fine-tuned models. Fine-tuned models generally have more consistent token focus across multiple layers.

3 Visualization of Probing Analysis

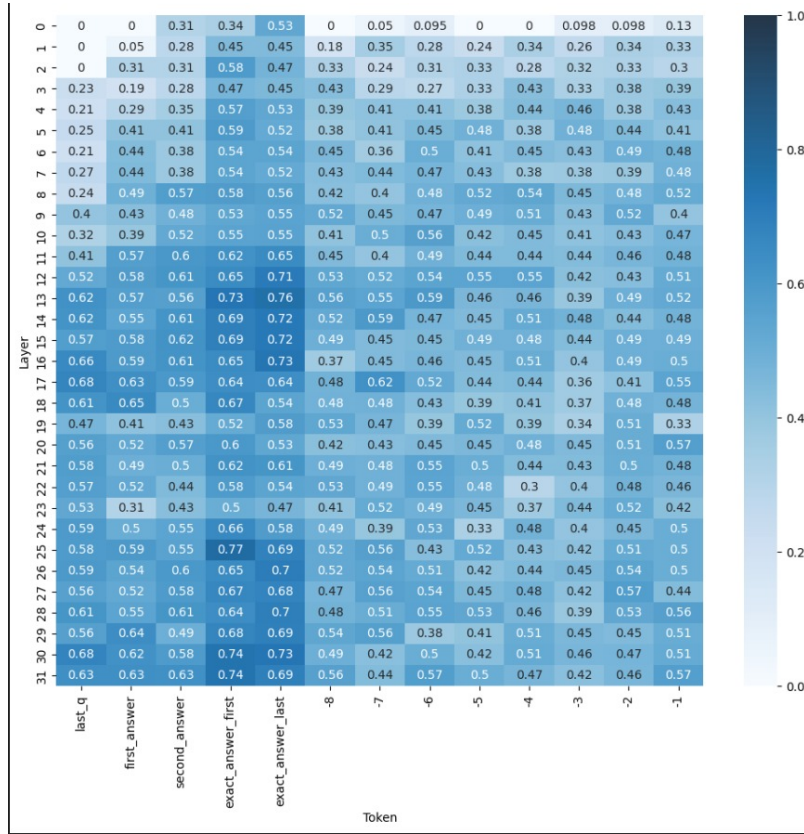


Figure 1: Maradona Event - Positive Class

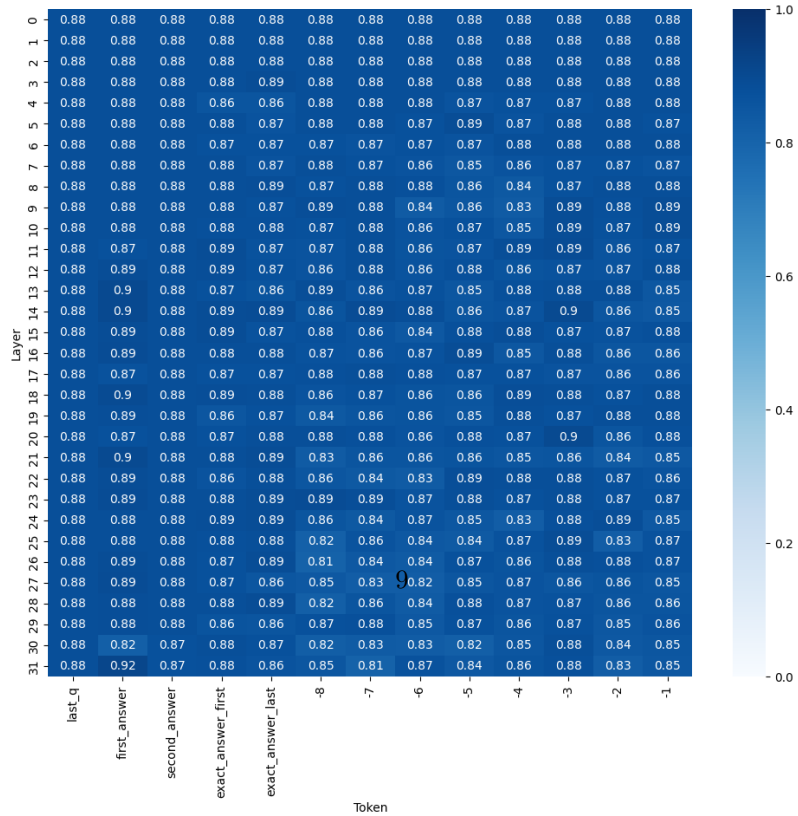


Figure 2: Frank Lampard Event - Negative Class