Trader Behaviour vs Market Sentiment – Data Analysis Report

Objective

The goal of this analysis is to explore how trader performance (profit and loss, trading behaviour, and volume) varies with the overall **market sentiment** represented by the *Bitcoin Fear and Greed Index*.

The objective is to uncover patterns in trading behaviour that can help in designing **smarter trading strategies** — for example, identifying when traders are most profitable or when excessive greed or fear leads to poor outcomes.

Data Overview

1. Historical Trader Data (from Hyperliquid)

• **Rows:** ~211,000 trades

Key Columns:

- Account Trader's unique ID
- Coin The traded cryptocurrency (e.g., Bitcoin)
- Execution Price Price at which the trade was executed
- Size USD Value of trade in USD
- Side Whether the trade was a BUY or SELL
- o Closed PnL Profit or loss after closing the position
- Timestamp IST Time of trade execution

This dataset helps understand **individual trading actions** and profitability.

2. Fear & Greed Index Data

Rows: ~2,600 daily entries

Columns:

- Date Calendar date
- ∨alue Numeric sentiment score (0–100; lower = Fear, higher = Greed)
- Classification Categorical sentiment (Extreme Fear, Fear, Neutral, Greed, Extreme Greed)

This dataset reflects **overall market psychology**, which often influences trading behavior. For example, traders tend to panic-sell during "Extreme Fear" and over-buy during "Extreme Greed."

Methodology

1. Data Cleaning and Preparation

- Converted all timestamps to proper datetime format.
- Extracted daily dates from trade timestamps to align with the sentiment data.
- Handled missing sentiment values using forward fill (ffill) to ensure smooth continuity.

2. Merging

- Merged both datasets on the date column.
- This allowed each trade to have the corresponding market sentiment on that day.

3. Feature Engineering

- Calculated PnL per USD to measure profit efficiency per dollar traded.
- Created **Net Position** (positive for BUY, negative for SELL).
- Aggregated daily metrics:
 - Total daily profit/loss
 - Average leverage (if available)
 - BUY vs SELL volume per day
 - Number of active traders per sentiment type

4. Exploratory Data Analysis (EDA)

- Compared BUY vs SELL profit across different sentiments.
- o Visualized daily trading volume and profit trends.
- $_{\circ}$ $\,$ Analyzed sentiment distribution across time.

Key Insights

Most Profitable Periods:

Traders achieved higher profits during periods of Fear and Extreme Fear.

This indicates that contrarian strategies (buying when others are fearful) tend to be more successful.

• 6 Greed Periods:

During **Greed** and **Extreme Greed**, profit levels dropped and volatility increased. Many traders possibly overleveraged or entered late in the rally.

BUY vs SELL Behavior:

- BUY volume was significantly higher during "Fear" phases suggesting traders try to "buy the dip."
- SELL volume peaked during "Greed" phases possibly profit-taking after a rally.

• Sentiment Stability:

Neutral periods showed balanced trading but lower overall returns.

• Trader Activity:

The number of active traders rose sharply during Fear, showing emotional reactions drive more trading activity.

Strategic Recommendations

1. Adopt a Contrarian Strategy:

- Historical data shows that buying during Fear and selling during Greed yields better outcomes.
- Example: A trader buying Bitcoin when sentiment score < 30 ("Extreme Fear")
 often profits once sentiment rises above 50.

2. Reduce Leverage During Greed:

- High leverage during market optimism increases downside risk when the market corrects.
- Traders should maintain moderate leverage (<2x) during "Greed" to protect capital.

3. Monitor Sentiment as a Leading Indicator:

- The Fear-Greed Index can act like a **sentiment thermometer**.
- Extreme emotions in the market often precede reversals a valuable signal for disciplined traders.

4. Diversify Positions During Neutral Sentiment:

 In stable sentiment zones, focus on smaller trades or range strategies rather than big directional bets.

Conclusion

Our analysis shows a clear pattern — traders perform best when the market is driven by **fear**, not **greed**.

When fear rises, disciplined strategies bring stronger profits.

So, our plan is to focus trades during fear phases, cut risk during greed, and use live sentiment data to guide decisions.

This way, our trading moves stay smart, calm, and data-backed — not emotional.