

# Trader Behavior vs Market Sentiment

**Project Title:** Data-Driven Insights into Trader Behavior under Fear & Greed Conditions  
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## 1. Objective

The objective is to quantify how trader performance, risk, and capital allocation align or diverge from overall market sentiment. The analysis seeks to answer: (1) whether traders perform better during Greed or Fear phases, (2) how leverage and volume vary with sentiment, and (3) how sentiment signals can guide smarter trading strategies.

## 2. Datasets

Dataset	Source	Key Columns	Purpose
Historical Trader Data	Hyperliquid	account, symbol, execution price, size, closedPnL, leverage	Trader behavior metrics
Fear & Greed Index	Alternative.me	date, classification (Fear/Greed)	Market sentiment tracking

## 3. Data Preparation & Aggregation

Data cleaning included timestamp normalization, numeric coercion, and handling missing leverage. Feature engineering introduced metrics such as Volume-Weighted PnL, StdDev\_Daily\_PnL, and Total\_Daily\_Volume. Data was aggregated daily and merged with the sentiment index via inner join on 'Date'.

## 4. Analysis & Insights

The sentiment classes were simplified into Fear, Neutral, and Greed. Comparative statistical analysis revealed clear differences in performance metrics. Traders exhibited higher mean and median daily PnL during Greed phases, indicating market momentum drives profitability. Volume-weighted PnL also increased during Greed, suggesting traders deploy higher capital during bullish sentiment. A T-test on Total Daily PnL showed statistically significant difference ( $p < 0.05$ ) between Fear and Greed days.

## 5. Key Insights

- Profitability Trend:** Traders perform significantly better during Greed periods, showing momentum-driven behavior.
- Conviction-Adjusted Returns:** Volume-weighted PnL is higher during Greed, indicating stronger confidence in trades.
- Risk Profile:** Volatility in trade outcomes increases under Greed, implying more aggressive strategies.
- Strategic Recommendation:** Focus on VW\_PnL patterns; investigate BUY/SELL directionality during profitable sentiment.

## 6. Deliverables

- notebook\_1.ipynb – Data Preparation & Aggregation
- notebook\_2.ipynb – Analysis & Visualization

- csv\_files/daily\_metrics\_merged.csv
- outputs/sentiment\_vs\_advanced\_performance.png
- ds\_report.pdf (this document)

## **7. Conclusion**

The study successfully established measurable links between trader profitability and market sentiment. Greed phases exhibit higher profits and risk-taking, while Fear phases reflect conservative, lower-volume trading. These insights can be operationalized into sentiment-driven trading algorithms for adaptive portfolio management.