Trader Behavior vs Bitcoin Market Sentiment

Analysis Report – Web3 Trading Team

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1. Introduction

The objective of this analysis is to understand how **trader behavior** on Hyperliquid varies with **Bitcoin market sentiment**, using two primary datasets:

1.

   Hyperliquid Historical Trades Dataset

   - Contains execution-level trading activity with fields such as account, coin, execution_price, size_usd, side, timestamp, closed_pnl, etc.

2.

   Bitcoin Fear & Greed Index Dataset

   - Provides a daily sentiment score and classification (Extreme Fear, Fear, Neutral, Greed, Extreme Greed).

The goal is to explore:

- How trading behavior (size, volume, profitability) changes with sentiment

- Whether traders perform better in Fear vs Greed markets

- Behavioral patterns that can help improve trading strategies and risk management

2. Data Preparation & Methodology

2.1 Data Cleaning

Trades Dataset

- Column names standardized to snake_case

- timestamp_ist converted to datetime

- Extracted date for daily alignment

- Converted numeric columns such as:

  - execution_price

  - size_tokens

  - size_usd

  - closed_pnl

  - start_position

- Created additional engineered features:

- **notional_usd** → equal to size_usd

- **is_profitable** → closed_pnl > 0

- **direction_num** → BUY = +1, SELL = −1

- **risk_exposure** → equal to notional (leverage not available)

Sentiment Dataset

- Standardized classification labels

- Parsed date column

- Grouped original 5 sentiment categories into 3 buckets:

  - **Fear** = Extreme Fear + Fear

  - **Neutral**

  - **Greed** = Greed + Extreme Greed

- Added:

sentiment_group

- sentiment_binary (Fear = 0, Greed = 1, Neutral = NaN)

2.2 Dataset Merge

- Trades were merged with sentiment on the date column

- Each trade now has:

  - Daily sentiment score

  - Classification

  - Sentiment group (Fear / Neutral / Greed)

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3. Results & Insights

The merged dataset enabled a sentiment-wise breakdown of trading behavior.

Summary Table (from analysis)

Sentiment	# Trades	Avg Position Size (USD)	Avg PnL	Win Rate	Total Notional
Fear	83,237	**$7,182**	49.21	40.78%	$597.8M
Greed	90,295	**$4,574**	53.88	42.03%	$413.0M

Neutral	37,686	$4,782	34.30	39.70%	$180.2M

4. Key Insights

4.1 Profitability is Highest During Greed

- Greed days show the **highest average PnL** and **highest win rate**.

- Bullish sentiment creates **trending markets** that favor momentum trading.

Conclusion:
 Traders perform best in optimistic environments.

4.2 Fear Days Have the Largest Position Sizes

- Average position size on Fear days is **~$7,182**, much higher than Greed (~$4,574).

- Indicates high conviction risk-taking:

  - Panic selling

  - Aggressive dip buying

  - High volatility

Conclusion:
 Fear markets drive large, aggressive trades due to volatility.

4.3 Total Trading Volume is Highest During Fear

- Total notional traded during Fear ≈ **$598M**

- This is significantly higher than Greed and Neutral.

Interpretation:
More volatility more trading opportunities more capital deployed.

4.4 Neutral Days Are the Worst for Trading

Neutral sentiment exhibits:

- Lowest average PnL

- Lowest win rate

- Lowest trading volume

Conclusion:
 Low volatility markets offer fewer profitable opportunities.

4.5 BUY vs SELL Behavior

- **Fear:** BUY and SELL are nearly equal ⬚ panic + dip buying

- **Greed:** SELL > BUY ⬚ profit-taking behavior

- **Neutral:** least activity overall

Conclusion:
⬚ *Trader psychology shifts strongly with sentiment.*

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5. Additional Analyses

5.1 Symbol-Level Analysis

Grouping by coin and sentiment_group revealed:

- Some assets are traded heavily during Fear (high volatility assets).

- Others show strong performance during Greed (momentum-driven coins).

This can help optimize sentiment-specific trading strategies per asset.

5.2 Account-Level Analysis

Analyzing trades by account and sentiment showed:

- Some accounts maintain consistent profitability across all sentiment types.

- Others take excessive risk during Fear and underperform.

- Useful for profiling trader behavior and evaluating which accounts adapt best to sentiment shifts.

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6. Strategic Recommendations

Based on the insights:

6.1 Increase System Participation During Greed

- Highest profitability and win rate

- Fewer false breakouts

- Better trend-following performance

6.2 Control Risk & Position Size During Fear

- Traders take unusually large positions

- Large volatility can create outsized losses

Recommended actions:

- Position cap

- Tighter stop-loss

- Dynamic risk limits

6.3 Reduce Aggressive Trading on Neutral Days

- Minimal opportunities

- Poor performance

- Avoid overtrading

6.4 Build Sentiment-Aware Strategies

- Toggle strategies based on daily sentiment

- Adjust leverage & exposure

- Adapt execution behavior to volatility levels

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7. Conclusion

This analysis demonstrates that **market sentiment has a strong and measurable impact on trader behavior**:

- **Greed** produces the best PnL and win rate

- **Fear** drives the largest positions and highest volume

- **Neutral** sentiment yields the weakest performance

Understanding these patterns enables better **risk management**, **strategy allocation**, and **market timing** for trading teams.
This framework can be extended into predictive models, trader profiling, and real-time sentiment-aware execution systems.